Institutions and Innovation in Economic Development: Schumpeterian Perspectives

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1 INTRODUCTION

Joseph A. Schumpeter is widely regarded as one of the most influential economists of the twentieth century. His works contain various efforts in economic theorising on problems of growth, development and innovation, yet also involving sociological issues that provided insights for the analysis of entrepreneurship. This comprehensiveness, however, is based on a persisting concern with the dynamism of economic development, viewed in the institutional setting of capitalist market economies. Thus, Schumpeter may be assessed as a theorist of the developmental pattern of modern capitalism. Indeed, current discussions on the determinants of economic development have contributed to a renaissance of Schumpeterian thought, reflecting the rapid technological and institutional changes that shape the economic performance of both industrialised and industrialising economies. A distinctly Schumpeterian approach has evolved, that deals with economic development as an evolutionary process, driven by technological innovations. This perspective implies a prominent role for historical and institutional aspects in the analysis of development processes. Nonetheless, so far these specific aspects of Schumpeter's theorising have been largely neglected as, although they constitute a fundamental continuity in the proceedings of the corresponding research agenda. Moreover, the institutional dimension of the Schumpeterian perspective contributes to its persistent relevance, as it underlines the relationship between institutional change and technological innovation, thus pointing to the outstanding role of entrepreneurship in economic change.

Accounting for this analytical setting, then, the following chapters reconsider the Schumpeterian perspective on institutions and innovation in economic development. Basically, the exposition proceeds with a theoretical reconstruction, conceptual modification and policy-oriented application of the institutional dimension of Schumpeter's approach.[1] This institutional dimension highlights the core of Schumpeterian concerns, namely the internal mechanism that drives the evolutionary dynamism of capitalist market economies. In particular, the intellectual context of these concerns in Schumpeter's theorising is taken to the fore, that is primarily the German Historical School, which inspired the concept of economic sociology, but also the tradition of Austrian economics. Accordingly, an analytical emphasis in the exposition is on the matter of entrepreneurship, which is examined regarding its explanatory status in diverse theoretical frameworks. Beyond the domain of the history of economic thought, then, contemporary approaches under scrutiny include market process theory and evolutionary economics, among others, accompanied by related discussions on institutional affairs in development economics, endogenous growth theory and the economics of innovation. In this context, the latter approaches may be subsumed under the concept of a neo-Schumpeterian synthesis which attempts to regain and update essential aspects of Schumpeter's thought in application to current issues.[2] Again, this underlines the significance of a reconsideration of the substantial content of Schumpeterian thought.

Three arguments guide the orientation of the study. First, the Schumpeterian perspective approaches the relationship between institutions and innovation in economic

[1] In accordance with Blaug's distinction between rational and historical reconstruction, both methods are taken to the fore. The former aims at a reconstruction in the context of present discussions, whereas the latter utilises the historical context as a relevant framework of analysis (Blaug 1997: 213).

[2] In particular, these revitalised positions have been said to exhibit a process orientation from a socio-economic point of view, focusing on entrepreneurship, innovation and competition (Giersch 1984: 105n).

development, understood as an evolutionary process that is a historically specific characteristic of modern capitalism. The Schumpeterian notion of entrepreneurship, denoted as the capability for introducing novelty by means of economic leadership, is meant to address the fundamental institutional factors in that process. It is complemented by types of entrepreneurship that focus more specifically on coordination efforts. In this sense, a typology of entrepreneurship needs to address also the related paradigmatic qualities regarding the formation of technological and institutional change. Second, the entrepreneurial function may be executed by various economic agents in diverse institutional settings. Entrepreneurial capability is embedded in the context of a historically specific institutional setting which shapes the articulation of entrepreneurship and thus the innovation performance of firms and industries. Third, the patterns of economic growth and development in various nations and regions are marked by these distinct entrepreneurial capabilities, in terms of an embedded entrepreneurship. This position allows for elaborating on the institutional foundations of innovation policies in the stimulation and coordination of technological change, framed by complex strategies for the promotion of economic development and structural change.

Schumpeter's approach to economic development aims to achieve an integrated theoretical, statistical, historical and institutional analysis of the mechanism and contours of economic evolution in the setting of modern capitalism. It should offer an endogenous approach, dealing with internal factors of change that reach beyond the impact of initial conditions by focussing on those factors that evolve only during the economic process, namely unexpected innovations. Indeed, the process of innovation is perceived as the decisive internal source of economic change, basically denoting the implementation of new production processes and the commercialisation of new products, its economic effects, and the response by the economic system which generates the cyclical fluctuations that shape the contours of economic development. This introduction of novelty into the economic process stimulates a mode of discontinuous change which revolutionises established patterns of production and consumption in the course of a competitive process of "creative destruction". Accordingly, the entrepreneurial function of carrying out innovation represents the decisive institutional component of Schumpeter's approach. Its articulation is embedded in a historically rooted variety of institutional forms, reflecting specific phases of capitalist development. Still, the institutional core of Schumpeter's theory of economic development mirrors the development pattern of competitive capitalism in Western Europe and the United States during the 19th century, followed by a phase of trustification.

Accordingly, capitalism is defined in institutional terms as a private property economy in which innovations are carried out by means of borrowed purchasing power. The underlying theoretical scheme holds that the entrepreneur sets up a firm which is credit-financed by risk-taking capitalists. Making use of available inventions, he introduces innovations which yield an entrepreneurial profit. The Schumpeterian approach thus combines the domain of production and innovation with the monetary sphere by analysing capital, credit, profit and interest as development phenomena in monetary terms. The corresponding institutional dynamism of the development process is characterised by a tendency of rationalisation that confronts the persistence of institutional variety as a condition of capitalist economic development, due to its role in the articulation of entrepreneurship. Therefore, discontinuous change and historical continuity complement each other as microscopic and macroscopic perspectives, depending on the degree of historical abstraction. Summarising these ideas, the

Schumpeterian approach includes a specific view of economic evolution and its theoretical perception, a concern with the varieties of economic behaviour, as well as a recognition of the interplay of institutional and technological change. It may be argued that these concepts and their underlying positions constitute the analytical core of the Schumpeterian research program.[3]

An outline of Schumpeter's biographical profile mirrors the fact that his scientific endeavours were pursued in diverse contextual settings, exhibiting distinct historical and institutional profiles that should contribute to the Schumpeterian view on the development process.[4] Born on 8 February 1883 in Trest, Moravia, Schumpeter was educated in an atmosphere of aristocratic elitism in Vienna, the imperial capital of the Austro-Hungarian Empire. After he had received a classical education at the exclusive Viennese Theresianum he moved on to study law and economics at the University of Vienna, learning from teachers like Böhm-Bawerk and Wieser, among others, yet additionally experiencing academic education in Berlin and London. After he had received the doctor of law degree in 1906, Schumpeter temporarily practiced as a lawyer and financial advisor in Cairo, Egypt, where he prepared "*Wesen und Hauptinhalt der theoretischen Nationalökonomie*", his first monograph on the scope and limits of static economic theory which was published in 1908 and accepted as a habilitation thesis in Vienna a year later. After the return to academic life, he cancelled an appointment as a professor at the Bohemian University of Czernowitz, today Ukraine, in order to move to the University of Graz, Austria, in 1911.

In the same year, the "*Theorie der wirtschaftlichen Entwicklung*" became available, officially published in 1912, in which Schumpeter presented his approach to dynamising economic theory. Entrepreneurship, innovation and economic evolution constituted key concepts in that attempt at an explanation of capital, credit, interest, entrepreneurial profit and business cycles as dynamic phenomena. However, World War I and the breakdown of the Austro-Hungarian empire heralded another interruption in Schumpeter's academic career which had already achieved substantial international recognition. Continuing with political ambitions that had emerged during wartime, he became briefly involved in post-war politics, most prominently as a member of the German Commission on Socialisation and as an Austrian Minister of Finance. Subsequent activities in the Viennese private banking sector also proved to be a failure. The return to academia then led Schumpeter to the University of Bonn, Germany, in 1925. There he prepared the slightly abridged and partly reformulated definitive second edition of the "*Theorie*".

In accordance with the international acclaim of his works, however, Schumpeter accepted an invitation for a professorship at Harvard University in the United States where he stayed from 1932 onwards. The "Theory of Economic Development" was published in 1934, containing an authorised English translation of the "*Theorie*", proceeding with minor alterations of the original exposition. The voluminous "Business Cycles" with its extensive historical and statistical material followed in 1939. Met with

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[3] Indeed, an evaluation of Schumpeter's thought may be approached with reference to Lakatos's thesis that scientific progress refers to clusters of interconnected theories. These "scientific research programs" consist of a "hard core", which contains shared beliefs and research heuristics, whereas the "protective belt" addresses auxiliary assumptions that contribute to the falsification of testable theories (Blaug 1980: 35n). The statistical elaboration of the analytical core provides an array of refutable theories, accompanied by an additional segment of auxiliary approaches which deal with institutional change in capitalist development (Helburn 1986: 165). However, further domains for a discussion of these institutional aspects include sociological and even political issues, ranging from imperialism to parliamentary democracy. (Ebner 2001b).

[4] For biographical details see Swedberg (1991) and Stolper (1994).

evident attention, it failed to convince the academic public. This was quite in contrast to the favourable reception for "Capitalism, Socialism and Democracy", published in 1942. Its integration of economic, sociological and political perspectives on Marxism, the institutional decline of capitalism and the economic feasibility of socialism basically offered updated variations of earlier essays. Schumpeter died in 1950 at his home in Taconic, Connecticut, respected by most while controversial to many contemporaries. The "History of Economic Analysis", an extensive study of the history of economic thought that completed earlier works, was edited posthumously in 1954, representing a worthy final act of Schumpeter's intellectual performance.

This biographical profile indicates that Schumpeter witnessed historical cases of economic development as distinct as late industrialisation in the Austro-Hungarian Empire, catch-up growth and industrial trustification in the German economy, as well as the emergence of a system of industrial mass production with extensive policy regulation in the United States. Indeed, these outstanding cases shaped the Schumpeterian view on institutions and innovation, based on a common concern with the internal mechanism of economic development. A historical illustration of these Schumpeterian concerns may refer to the levels and growth rates of the gross domestic product per head of population as an approximation of the welfare implications of economic development in a capitalist setting. Indeed, the world economy has been growing over the past 200 years faster than ever before in economic history.[5] Despite the diverse problems of measurement and interpretation it may be stated that the multiplication coefficient of GDP levels per head of population in the period of capitalist development between 1820 and 1989, expressed at 1985 US-Dollar prices, was about 8 in the United Kingdom, 15 in Germany, 17 in the United States, and 26 in Japan (Maddison 1991: 7).[6]

The unprecedented growth of the world economy was accompanied by structural changes in terms of a shift from agriculture to industry and services as dominant sectors. This is most significant with regard to the economies of Western Europe and North America, that is the area where modern capitalism evolved, spreading all over other continents, with most exceptional results in the case of Japan and the East Asian newly industrialising economies. However, these economies have grown at different and variable growth rates. Although convergence tendencies have been observed in the developed high-income economies, the majority of developing economies seems to exhibit a diverging growth performance (Maddison 1991: 48n). Catch-up growth seems to have been a well-documented phenomenon, including Continental Europe catching up with the United Kingdom in the 19th century, Scandinavia catching up with Continental Europe in the early 20th century and the East Asian economies catching up with Europe in the late 20th century. These growth and development profiles have been accompanied by rare cases of a forging ahead of certain countries in terms of productivity levels. Examples are the United Kingdom overtaking Holland in the 18th century, the United States and Germany overtaking the United Kingdom in the late 19th

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[5] In his empirical growth analyses, Kuznets followed Schumpeter in claiming that "modern economic growth" persisted as a historical epoch of accelerated growth since the late 18th century, characterised by a combination of financial and industrial dynamics that would be typical for modern capitalism. Accordingly, the growth of the per capita product was said to result from productivity increases based on the institutional relationship of science, technology, production and innovation (Kuznets 1971: 303n).

[6] However, Maddison rejects the Schumpeterian business cycle concept in favour of the notion of growth phases which resemble Schumpeterian phases of capitalist development with their specific institutional and structural patterns. The underlying argument suggests that Schumpeter's business cycle scheme lacks from empirical validity regarding the clustering of innovations and cyclical regularity (Maddison 1982: 79n).

century, and Japan temporarily overtaking a majority of European economies in the late 20th century. However, also cases of a slow-down of growth rates which point to a falling behind of former high-income economies have been identified, involving most Latin American economies and the socialist economies of Central and Eastern Europe (Maddison 1991: 30n). Consequently, the recorded growth performance is to be considered as country-specific, not at all subject to an exogenously driven convergence mechanism.[7]

An assessment of the role of institutional and technological change in the explanation of economic growth faces methodological problems that are related with the matter of quantification. Therefore, Maddison has differentiated between "proximate" and "ultimate" causality. Proximate causality denotes the quantifiable surface of growth and development indicators, to be used as arguments in a neoclassical production function framework, such as natural resources and physical capital augmented by technological progress, human capital in terms of labour augmented by education and knowledge, both influenced by the efficiency of resource allocation and international openness. Ultimate causality denotes the qualitative factors that are not to be quantified as driving forces of the proximate factors. They include the institutional, organisational and political aspects that constitute the process of economic development, framed by the international economic order. According to Maddison, then, ultimate causality needs to be viewed by integrating theoretical and historical aspects, to be combined with sociological arguments of the type put forward by Max Weber (Maddison 1994: 32n). Actually, a similar argument had been stated by Abramovitz in an earlier survey of growth theory:

> "Long-term growth presumably constitutes a process of cumulative rather than repetitive change to a greater degree than other economic phenomena. The study of economic growth, therefore, stands closer to history than do other economic subjects. (...) The sweeping visions of Marx, Sombart, Weber, and others will, no doubt, colour and direct our thoughts and work, but the generalizations we trust will be less profound and of narrower application" (Abramovitz 1952: 177n).

Supplementing this argument by introducing the Schumpeterian perspective as its most appropriate expression in theorising on growth and development then may suffice as a point of departure for outlining the research venture that provides the content of the following chapters.

Indeed, recent debates among economic historians have alluded to these Schumpeterian themes.[8] Particularly important is the utilisation of new technologies for economic growth, depending on the established institutional setting. In the historically unprecedented case of the European "economic miracle" a partial retreat of government in favour of private sector activities seems to have been decisive. Private sector entrepreneurship then contributed to technological innovation and market coordination as requirements of a sustained growth and development performance. According to Jones, a crucial motive for the public nurturing of private entrepreneurship was provided by the mercantilist rivalry of modern states with its instrumental perception of

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[7] A striking example is provided by the comparison of South Korea and Ghana. They shared the same level of per capita income in the 1950s, yet in 1991 South Korea exhibited a per capita income that was seven times higher than Ghana's (World Bank 1999: 20).

[8] Blaug has underlined the status of research on entrepreneurship as a Schumpeterian topic: "If we fully understood the nature of industrial entrepreneurship and the conditions under which it flourishes, (...) we would at long last be near to answering the great question with which economics began: what are the causes of the wealth of nations?" (Blaug 1986: 176).

economic performance (Jones 1988: 176n). Landes advocates the related thesis of an "European exceptionalism", derived from the evolution of property rights, administrative decentralisation, and political fragmentation that allowed for private initiative and novelty-embracing attitudes as conditions of technological invention and innovation (Landes 1998: 29n; 45n). The First Industrial Revolution in Europe is accordingly viewed as a result of accumulated knowledge, based on a persisting search for novelty in the advent of modern science and the routinisation of research (Landes 1998: 200n). In a similar fashion, the role of legal and cultural norms in the Western hemisphere has been stated by pointing at the rewarding attitude towards experimentation in the arts, science and commerce (Rosenberg and Birdzell 1986: 2n).[9] This matter of institutions and innovation shapes also the present profile of economic development on a global scale. Knowledge-based growth and development, set in motion by technological knowledge and skills, continuously determines the standard of living in high and low income economies alike (World Bank 1999: 16n). Hence, the institutional mechanisms that have stimulated the evolution of modern capitalism in Europe persist with forming economic process in nations and regions irrespective of already achieved levels of income. From a Schumpeterian point of view, then, this implies that all economies need to be viewed as continuously evolving entities, as their specific profile of economic development remains subject to an undetermined as well as uncertain process.

The following exposition pinpoints the role of institutions and innovation in the Schumpeterian research program, accounting for its theoretical context as well as for the diverse influences that shaped its orientation, yet also highlighting its impact on those strands of modern economic theory that have been stimulated by the Schumpeterian research program. At first, the exposition assesses Schumpeterian ideas in the context of the history of economic thought, focussing on the role of the German Historical School regarding the underlying concerns with the institutional foundations of modern capitalism. This procedure emphasises the matter of entrepreneurship, which is additionally approached in terms of its theoretical basis. Hence, the exposition evolves towards a comparative analysis of theorising on entrepreneurship and innovation, focussing on Austrian and evolutionary approaches, additionally addressing recent efforts in growth theory concerning an adequate representation of innovation processes. Subsequent expositions of the institutional aspects of technological change, dealing with the concepts of paradigm and trajectory, then lead to a discussion of the embeddedness of entrepreneurship in institutional networks, constituting a distinct style of economic development.

In particular, the first chapters reconstruct Schumpeter's theory of economic development by exploring its institutional aspects. As a first approximation, theory, vision and institutional content of Schumpeter's approach are examined, emphasising the specificity of the Schumpeterian concepts of innovation, competition, and evolutionary change. Moreover, Schumpeter's theory of economic development is presented as an attempt of integrating theory and history by introducing historically specific institutional dimensions; a concern that was also of constitutive importance for the research perspective of the German Historical School. It is pointed out that the relationship between Schumpeter and the German Historical School informed Schumpeter's concern with the economic evolution of modern capitalism as an object of inquiry, hinting at the influence of both Marxian and Schmollerian ideas. Apart from the

[9] This position is related with North's thesis on the historical evolution of a property rights framework that established economic incentives for innovation by raising the private rate of returns (North 1981: 64n).

Weberian impact, efforts regarding an elaboration of historical theories on that subject point to Sombart's concept of economic system and Spiethoff's concept of economic style. The related discussion of entrepreneurship as a dynamising force in the evolution of modern capitalism focuses on the particular contributions of Schmoller, Max Weber and Sombart.

Subsequently, Schumpeter's concept of the institutional order of capitalism is examined, pointing at the role of institutional variety in forming the development functions of invention, finance and entrepreneurship. In this context, the Schumpeterian notion of entrepreneurship is compared with other theories, notably those related with Austrian market process theory, in order to point out their particular analytical strengths. This discussion is introduced by highlighting early Austrian positions of Menger and Wieser, with an emphasis on the latter's notion of leadership as an entrepreneurial function. Indeed, Schumpeterian entrepreneurship is reconstructed with reference to the role of leadership in the introduction of novelty, accompanied by institutional variety in the motivation of entrepreneurial activity. The notion of historicity then allows for distinguishing between the functions and the carriers of entrepreneurship depending on the historically-specific institutional setting, thus involving the scenario of a transformation of entrepreneurship.

This position is compared with the Austrian tradition of Mises and Hayek, which has been resumed in Kirzner's approach to entrepreneurship with its aspects of alertness, discovery and equilibration. The related research framework on market competition is also promoted by evolutionary approaches which examine entrepreneurship on an individualist basis, paralleled by a behavioural strand that focuses on organisational routines. Accounting for these positions, an assessment of the analytical status of entrepreneurship in the discussions of development economics highlights a continuum of Schumpeterian and Austrian concepts, which is most relevant in the case of industrialisation, pinpointing the role of entrepreneurship for the shaping of linkages and related efforts in market-making. A summarising typology of entrepreneurship then presents a synthesis of Schumpeterian and Austrian entrepreneurship, pointing to the particular functions of innovation and coordination that need to be carried out in the development process.

The succeeding chapters are concerned with the institutional dimensions of innovation, examining neo-Schumpeterian approaches with regard to their perception of Schumpeterian concepts. The underlying thesis suggests that a useful theory of economic development needs to be based on a concept of innovation that allows for an appropriate representation of entrepreneurship. Accordingly, based on a recombination of entrepreneurship and technology, the exposition underlines the paradigmatic qualities of entrepreneurial activities that are associated with innovation and coordination as entrepreneurial functions. Similar concerns apply to the modelling of technological knowledge as factor of endogenous growth. In order to grasp the institutional dimension of these points, subsequent sections point to a modification of Schumpeterian entrepreneurship. In particular, the systems of innovation approach is discussed, denoting institutional networks in the generation and diffusion of new technologies. Their impact is highlighted with respect to entrepreneurial capabilities which promote technology assimilation in catch-up growth. At last, the notion of economic style is reconsidered as a representation of institutional and structural forms which characterise the development performance of countries or regions. The notion of embedded entrepreneurship then refers to the institutional articulation of these entrepreneurial capabilities. A discussion of implications for innovation policies concludes the exposition, reviewing possibilities for governing the institutional dimensions of

innovation, and thus underlining once more the persistent significance of the Schumpeterian perspective.

2 SCHUMPETER: THE THEORY AND THE VISION

2.1 THEORETICAL ORIENTATION: EQUILIBRIUM AND EVOLUTION

The fundamental concepts in Schumpeter's theory of economic development highlight three specific dichotomies: first, real processes of the circular flow versus evolutionary change; second, static versus dynamic theoretical apparatuses; third, entrepreneurial versus ordinary types of behaviour (Schumpeter 1926a: 121n). The distinction between circular flow and economic evolution thus serves as the corner-stone of Schumpeterian thought, paralleled by static and dynamic economic theories and a differentiation of related types of economic behaviour.[10] Schumpeter claimed already in "*Wesen und Hauptinhalt der theoretischen Nationalökonomie*", his first monograph of 1908, that static analysis should focus on the quantitative relations between goods in analogy to the formal procedures of mechanics, echoing the thesis of a "pure" static core of economic analysis as exemplified by Walrasian theory: "Exact economics is not a philosophy of the economic action of man (...) It is not a theory of economic motives (...) What kind of motives characterise man, this is not what we ask for" (Schumpeter 1908: 77, translation by author). A related argument maintained that economic development as an object of inquiry would exceed the narrow range of purely economic aspects (Schumpeter 1908: 80). This should justify delegating the matter of entrepreneurship, which would constitute the institutional basis of the theory of economic development later on, to the analytical domain of sociology (Schumpeter 1908: 351). However, already in "*Wesen*", economic development was characterised as the most important of all economic phenomena under examination, to be analysed by means of a dynamic approach (Schumpeter 1908: 186).
These programmatic statements follow references to Walras and Wieser as decisive intellectual sources (Schumpeter 1908: IX). The Walrasian approach to general equilibrium theory is appreciated as a most abstract and logically pure approach in static economics; a position that was at odds with the contemporary German-speaking milieu of historism and Austrian value theory. Wieser's parallel influence reached beyond price theoretical concepts such as the subjective valuation of producer's goods by imputation, for his theory of leadership stimulated Schumpeter's concept of entrepreneurship as a pillar of dynamic theory, presented subsequently in the "*Theorie der wirtschaftlichen Entwicklung*". Indeed, Wieser, like other Austrian economists in the Mengerian tradition, acknowledged the evolutionary features of economic development, as he postulated the primacy of static theory as an abstract point of departure for dynamic analysis (Ekkelund 1970: 192n). These conceptual problems regarding a dynamisation of economic theory in order to cope with the matter of economic development were shared by other strands of neoclassical theory. Marshall, for instance, would not accept J. B. Clark's attempt to single out static forces, whereas

[10] The intellectual roots of the terms statics and dynamics, as perceived by Schumpeter, reach back to Comte's distinction between an equilibrating "spontaneous order" and evolutionary "natural progress". They were initially developed in the zoological writings of de Blainville and introduced to economic analysis by John Stuart Mill (Schumpeter 1954: 416n). Comte argued in favour of a "rational mechanics" in which statics would entitle the fundamental nature of the "social organism", and dynamics its ongoing evolution (Louçã 1997: 226n).

his own concept of statics in short-period analysis denoted a position of rest due to the impact of opposing forces. Dynamic theory should reduce this role of mechanistic analogies in favour of biological ones (Hodgson 1993: 99n).[11]
Consequently, both Schumpeter's attempts at providing a dynamic theory based on a static groundwork, as well as his later orientation towards evolutionary ideas belonged to the contemporary repertoire of neoclassical theorising. A more distinctive line of reasoning was offered by relating economic dynamics with historical theory. In "*Wesen*", Schumpeter actually outlined a classification of static and dynamic phenomena that were to be dealt with by static and dynamic economic theories. Yet additionally he argued that pure theory represents deductive reasoning on economic universals, while historical theory takes account of singular hypotheses concerning concrete historical facts. Although it does not provide a system of exact statements that is able to claim general validity, it could provide insights for dynamic problems (Schumpeter 1908: 18n).
Schumpeter's approach to economic dynamics went through various conceptual clarifications. In early works like "*Wesen*" and "*Theorie*" the stationary state was synonymous with an adaptive type of "static economy" that proceeds identically over time, best explored by means of static analysis (Schumpeter 1926a: 75n). In the statistical endeavour of "Business Cycles", however, the stationary economy was presented more rigorously as a process which reproduces itself at constant rates within a given framework of institutions, technologies and preferences. The production function is invariant, as production is synchronised in a way that current receipts finance expenditures, while there is no entrepreneurial activity to be considered (Schumpeter 1939: 38n).[12] The monetary sphere of credit, capital and interest does not interfere with this setting which may be characterised by a constellation of Walrasian general equilibrium, as well as by Marshallian long-term equilibrium in which all the system variables conform to "normal values" of a normal business situation (Schumpeter 1939: 45). In this stationary system, price or quantity deviations stimulate a routine of equilibrating reactions of firms and households. Thus equilibrium theory resembles "a description of an apparatus of response" (Schumpeter 1939: 68).
With reference to the dimension of time, the late Schumpeter suggested more explicitly that static analysis would address relations between prices and quantities of commodities with reference to the same point of time. Economic dynamics, defined in terms of Ragnar Frisch as an analytical device that explores sequences in time, should account for preceding points in time as well as for expectations about future values of economic variables, including lags and rates of change (Schumpeter 1942: 103).[13] In contrast to earlier practice, this would not imply an analysis of the evolutionary process itself, for dynamic analysis refers exclusively to logical time and not to historical time

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[11] In earlier statements even Jevons had postulated:" (T)here must arise a science of the development of economic forms and relations" (Jevons 1871/1970: 49).
[12] Accordingly, the stationary state has been characterised as an "automaton" in which production and distribution are "synchronised"; a notion borrowed from J. B. Clark's theory of production and distribution. The domestic product is distributed according to the contributions of the economic agents, as valued by the competitive market mechanism, yet proceeding without profit (Schumpeter 1917-18: 35n).
[13] The differentiation of static and dynamic theory versus static and dynamic economic phenomena, adopted in Schumpeter's late works, owed much to Frisch's econometric contributions with a pioneering distinction of static and dynamic methods dating from 1929. According to Frisch, dynamic analysis should use the concepts of "growth rates" or "reaction rates", whereas phenomena under consideration could be static or evolutionary. Moreover, Frisch distinguished analytical dynamics and historical dynamics. Both should deal with changes over time, although historical dynamics should denote those types of change which are not covered by exact laws (Andersen 1991b: 5n).

with its characteristics of irreversibility and openness. Consequently, Schumpeter introduced historical analysis as the decisive requirement for an evolutionary perspective on economic development (Schumpeter 1954: 963n). The analytical impact of historical positions on economic dynamics in a broad sense, already introduced in the early arguments of "*Wesen*", was thus specified with regard to processes of evolutionary change.

Another important facet of the distinction between circular flow and economic evolution refers to their character as economic settings where distinct types of economic behaviour may require likewise differing theoretical perspectives, informed by Schumpeter's quite Mengerian credo that "all economic theory is a theory of planning" (Schumpeter 1954: 908).[14] With reference to physiocratic thought, Schumpeter illustrated the nature of routine behaviour in the circular flow with the example of peasants whose mode of conduct echoes inherited habits, traditional values and experiences. This routine shapes current activities which are also marked by an embedding "network of social and economic relationships" (Schumpeter 1926a: 4n). This situation could be highlighted by invoking Wieser's "principle of continuity" which claims that any state of socio-economic affairs evolves from the preceding one. Schumpeter thus emphasised the impact of experience even with respect to equilibrating Walrasian *tâtonnement* (Schumpeter 1926a: 8n). In this context, Böhm-Bawerk's notion of time preference was criticised, for Schumpeter rejected the notion of a systematic under-valuation of future needs in the setting of the circular flow. Yield would be an object of routine procedures, while established production processes impeded further choices on the introduction of more roundabout production activities. Intertemporal substitution thus was denied analytical value in the circular flow (Schumpeter 1926a: 47n). Moreover, the suggestion held that the rationalisation of economic life promoted a hegemony of adaptive rationality "if things have time to hammer logic into men" (Schumpeter 1934: 80).

Schumpeter derived analytical deficits of static theory from the claim that its strength of rigorous precision would turn into a weakness when applied to the process of economic development, due to underlying assumptions on motionless reproduction which neglect dynamic functions in the economic process, namely entrepreneurship and capitalist finance. This would be paralleled by an exclusion of entrepreneurial profit, interest, capital and credit, culminating in a general disregard for crisis phenomena (Schumpeter 1926a: 77n).[15] The domain of dynamic theory should be associated with an analysis of the phenomena of economic development, denoting those spontaneous and discontinuous changes of the path trailed by the circular flow which are endogenously caused by economic processes (Schumpeter 1926a: 98n). Development then addressed "that kind of change arising from within the system *which so displaces its equilibrium point that the new one cannot be reached from the old one by infinitesimal steps* " (Schumpeter 1934: 64, emphasis in original). These aspects of spontaneity, discontinuity and endogeneity were put forward in order to accentuate Schumpeter's

[14] The merit of pioneering the economic analysis of the circular flow was attributed to the physiocratic approach (Schumpeter 1926a: 79n). In particular, Quesnay's "*tableau economique*" was appreciated as a forerunner of Walrasian general equilibrium analysis, for it pinpointed the interdependence of the wide-ranging market activities that constitute an economic system. In contrast, Marx's reproduction schemes, as outlined in the second volume of "*Das Kapital*", were not taken into account in Schumpeter's exposition, perhaps due to its underlying labour theory of value (Oakley 1990: 55).

[15] In particular, Schumpeter also sided with the line of criticism at the static neoclassical approach that pointed to its difficulties in dealing with increasing returns, multiple equilibria, and historical time (Schumpeter 1934: 63).

specific concern with evolutionary economic change apart from the supposedly too wide-ranging label of a dynamic economic theory (Schumpeter 1934: 64).
Based on these discussions, Schumpeter distinguished between the categories of economic growth and economic development. Economic growth denotes the slow, gradual and cumulative change of an economic system, resulting from external factors such as population growth and savings. Economic development denotes discontinuous change, endogenously driven by innovations. Schumpeter thus emphasised the relationship of growth and routine as opposed to evolution and innovation:

> "The slow and continuous increase in time of the national supply of productive means and of savings is obviously an important factor in explaining the course of economic history through the centuries, but it is completely overshadowed by the fact that development consists primarily in employing resources in a different way, in doing new things with them, irrespective of whether those resources increase or not" (Schumpeter 1934: 68).

In this context, the terms development and evolution are synonyms. Evolution in a wider sense comprises of phenomena that contribute to the non-stationary character of an economic process. In a narrow sense, it denotes the residual that remains when these phenomena have been analysed by accounting for those aspects which are defined by continuous variations of growth rates within a given framework of technologies, institutions and preferences (Schumpeter 1954: 964). Accordingly, economic evolution should comprise of innovation and its further effects, as Schumpeter pointed out: "The changes in the economic process brought about by innovation, together with all their effects, and the response to them by the economic system, we shall designate by the term Economic Evolution" (Schumpeter 1939: 86). Therefore, dynamic analysis according to the Schumpeter's mature position would allow for theorising on economic growth but not for approaching innovation-driven evolutionary change in economic development.[16]
This points to the place of business cycle research in Schumpeter's research programme. Indeed, Schumpeter's theory of economic development takes its point of departure in phenomena of economic crises which are understood as components of a business cycle pattern. The pioneering essay on that matter, namely "*Über das Wesen der Wirtschaftskrisen*" from 1910, dealt with the relationship of crisis theory, business cycles and development problems, based on the proposition that movements in the direction of equilibrium positions constitute an empirically observable trend (Schumpeter 1910a: 275n). A related definition of economic development focused on a "disruption of the static equilibrium of an economy" (Schumpeter 1910a: 324). Accordingly, also the first edition of "*Theorie*" introduced the crisis problem as an analytical point of departure for theorising on business cycles as a development pattern (Schumpeter 1912: VIII).
Both theoretically and empirically, these topics were discussed most elaborate in "Business Cycles", where Schumpeter presented the "fundamental question" of his research agenda as follows:

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[16] The distinction of stationary flow and economic evolution, involving routine business behaviour and drastic changes in business routines, was also illustrated by invoking an analogy rooted in zoology and physiology, namely the exploration of a dog's organism. An analysis of blood circulation and digestive mechanism would explain the life process but could not help to understand how the dog as a species had come into existence. This type of analysis would demand an application of concepts like mutation, selection and evolution (Schumpeter 1939: 36n). Hodgson's recent argument that Schumpeter perceived evolution merely as a kind of general "change", neglecting its conceptual foundations in evolutionary theory, thus does not hold (Hodgson 1993: 145n).

> "If we succeed in describing the economic system by means of a general schema embodying certain properties of it, there is obviously some point and much practical utility in asking the question whether the system, as thus depicted, will *by its own working* produce booms or crises or depressions and, if so, under what circumstances" (Schumpeter 1939: 34, emphasis in original).

The endogeneity of change is represented by innovation, contrasting with a notion of "exogenous shocks" in terms of stochastic disturbances that characterised contemporary business cycle theories like those of Frisch and Haberler.[17] The notion of equilibrium was adapted to these concerns, both as a theoretical figure and an empirical aspect of economic life. Schumpeter argued that cyclical phases of prosperity and depression are tied together by a "static state" of the economy, resulting from a process of "*Statisierung*", as the restructuring of the economy on the grounds of absorbing innovations leads to the establishment of a new equilibrium position which is never completed due to the introduction of new clusters of innovation (Schumpeter 1912: 447n).

This is the key argument in Schumpeter's proposal for a theory of economic development as a "theory of the existence of *discrete points* of proximate equilibrium" (Schumpeter 1926a: XX, emphasis in original). Accordingly, equilibrium was not supposed to denote the existence of ideal equilibrium points, as suggested by Walras, instead highlighting the readjustment force of an equilibrium tendency. Reference was thus made to certain ranges within which the system was close to equilibrium, that is "neighborhoods of equilibrium" (Schumpeter 1939: 70n). Suitably, Schumpeter's most favoured exponent of previous business cycle theories was Juglar with his idea of replacing the notion of crises by a two-phase scheme of prosperity and depression, which stimulated Schumpeter's definition of crises as "turning points of economic development" (Schumpeter 1926a: 234, 322). Moreover, Marxian theory provided additional stimulation by conceptualising accumulation as a movement leading away from equilibrium which could be periodically re-established through economic restructuring following the opening up of new business opportunities (Schumpeter 1954: 749). This theoretical orientation of Schumpeter's theoretical system, with its attempts of dynamising economic analysis and elaborating on an evolutionary direction also shapes its conceptual substance: the theory of innovation.

2.2 CONCEPTUAL SUBSTANCE: INNOVATION AND COMPETITION

Innovation provides opportunities for directing the means of productive resources to new ends, following a pattern of decreasing costs. According to Schumpeter, it is the ultimate internal factor of capitalist development, primarily represented by technological change, for it is neither implied nor directly caused by other internal factors of change (Schumpeter 1939: 86). Two more internal factors of economic development are reconsidered, namely changes in consumer tastes and changes in the quantity or quality of the factors of production (Schumpeter 1939: 73). Internal change of tastes, however, were qualified as subject to producer initiative, for major changes in consumption patterns would be regularly forced upon consumers by entrepreneurial

[17] Accordingly, Schumpeter's approach differed from the so-called econometric synthesis of the Slutsky-Frisch type with its modelling distinction of growth and cycle, differentiating between an exogenous generation of impulses by stochastic variables and their endogenous propagation through a system of simultaneous linear equations (Louçã 1997: 124n).

producers. Moreover, autonomous shifts of demand patterns are usually concerned with existing commodities. Similarly, variations in the numbers and quality of productive resources were interpreted as an effect rather than an autonomous source of change, affected and even caused by innovation (Schumpeter 1939: 73n).
Besides, innovation needs to be differentiated from external factors of change like inventions or scientific discoveries which become relevant to the economic process only when they enter commercial and industrial reality by acts of entrepreneurial realisation beyond the mere provision of scientific and technological opportunities. Unused technological possibilities enlarge the potential for innovation, but in order to become innovations these inventions need to be exploited commercially.[18] This notion of innovation draws upon a definition of production as the combination of available factors and forces. In this view, producing differently means combining differently, while the resulting new combinations denote innovations of process and products (Schumpeter 1926a: 100).
A neoclassical production function framework of the Cobb-Douglas type would delineate the production space of factor combinations which is limited by technological possibilities, thus covering "the practical range of choice open to all" (Schumpeter 1939: 89). Based on further assumptions which propose that innovations entail the construction or reconstruction of plant and equipment and that every innovation is embodied in a new firm, innovation is defined as the setting up of a new production function (Schumpeter 1939: 87). This is illustrated by Schumpeter's concept of the production function as a case of abstract "planning functions in a world of blueprints" which are heuristically useful in a model of planned plants, where every technologically variable input combination can be changed at will due to the absence of historical time and friction (Schumpeter 1954: 1031). However, the complementing alternative of a "realistic" production function was also proposed. Assuming labour and land as original factors of production, such a function should be empirically observable most convincingly in agriculture, providing rich material for modelling efforts (Schumpeter 1954: 1031n).
Further theoretical implications point to the matter of increasing returns and externalities, as discussed in the framework of Marshallian partial analysis.[19] According to Schumpeter, external economies should be conceptualised as downward shifts in the marginal and average cost curves of individual firms, reflecting the "historical growth of their environments" (Schumpeter 1954: 1046). Viewed separately from innovation processes, external economies were attributed only a status of secondary importance as driving forces of economic growth and development. The aspect of decreasing returns should illustrate their difference from the original innovation process (Schumpeter 1928b: 377). This position was directed against Allyn Young's thesis that increasing returns mirror economies of roundabout production, corresponding with the industrial division of labour and the extent of markets (Young 1928: 531n). According to Young, economic change exhibits a progressive, cumulative pattern that is independent from

[18] It has been proposed that Schumpeter derived this concept from a confrontation with J.B. Clark's suggestion that the sources of economic change were capital accumulation, population growth, changes of consumer tastes, technological change, and organisational change. According to Schumpeter, the first two sources only qualified for economic growth, while the third denoted an adaptation to changing data. Hence only the last two qualified as internal sources of economic change, subsumed under the notion of innovation (Elliott 1985: 11n).
[19] The discussion of that subject had been brought up with the so-called "cost controversy" of the 1920s, with Edgeworth, Sraffa, and Pigou among the most prominent participants, confronting the matter of competitive equilibrium, increasing returns and externalities in Marshallian theory (Blitch 1983: 359n).

single factors like scientific advance and population growth, yet driven unlimitedly by increasing returns and elastic demand structures (Young 1928: 534n).[20]
Instead, Schumpeter's notion of increasing returns should reveal the primacy of innovation. Indeed, externalities were said to be rooted in innovation, hence they would not exhibit an autonomous impact on the economic process (Schumpeter 1939: 93). In the case of a production function with monotonically decreasing marginal factor productivity, innovation would allow for breaking the tendency of diminishing returns by establishing a new function with higher product increments (Schumpeter 1939: 88). The notion of "historical increasing returns", put forward with reference to Turgot's law of returns with its intervals of increasing and decreasing returns within a given technological pattern, should reflect the impact of technological progress, as established curves shift to new positions. In the case of innovation, thus, there would be no decreasing returns to technological change (Schumpeter 1954: 262n). Stressing the irreversibility and uncertainty of innovation and economic development in historical time, Schumpeter even suggested:

> "(H)istorical increasing returns cannot, like the genuine ones, be represented by any curve or 'law'. Least of all by a curve on which we can travel back and forth. For new levels of technique are reached in the course of an irreversible historical process and are hidden from us until they are actually reached" (Schumpeter 1954: 263).

The correspondence between innovation, competition and structural change was already put forward "*Wesen*", characterising economic development as follows: "new foundations, created by means which were straightway not existing earlier, arise from the standpoint of the static system, that did not consider the existing possibilities, as it were from nothingness and push the old back into nothingness" (Schumpeter 1908: 420n, translation by author). The competitive nature of innovation is essentially derived from the "competing down" of outmoded agents and structures, basically firms and industries, which leads to the "competitive elimination of the old" (Schumpeter 1934: 66n). Economic evolution thus manifests itself in a discontinuous process of "creative destruction" which combines innovation and competitive restructuring (Schumpeter 1942: 83). Schumpeter then presented economic evolution as a type of progress in efficiency, based on an increasing long-run trend of productivity levels that would be paralleled by an expansion of the volume and scope of available consumption goods:

> "This is the formal nature of the process that periodically revolutionises and innovates industrial life. It takes effect on all domains, creates new life forms everywhere. Its inmost meaning lies in the provision of new qualities of goods and in the reorganisation of the economy in the direction of an ever increasing technological and commercial efficiency" (Schumpeter 1912: 492, translation by author).[21]

This argument was paralleled by a specific notion of competition, namely "competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of existing firms but at their foundations and their very lives" (Schumpeter 1942: 84). Consequently, although the analytical role of perfect

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[20] In particular, Young considered the perception of potential markets as a device for the organisation of large industries, driving economic change since the industrial revolution. In this context, the promotion of increasing returns would be associated with an interplay of scientific advance and the economic process (Young 1928: 535n).

[21] Additionally, the tendency of a declining price level underlying the cyclical movements of the evolutionary process was mentioned, discontinuously driven by "industrial mutations" (Schumpeter 1942: 83).

competition could be useful as a methodological device, its normative relevance was questioned. Already in "*Wesen*", Schumpeter had proposed: "The 'natural laws of the economy' do not at all demand free competition, and there is also no tendency for achieving it" (Schumpeter 1908: 193, translation by author). Indeed, as the introduction of novelty seemed to point at the theoretical limitations of perfect competition, the late Schumpeter argued consistently that the model of perfect competition could not deal with innovation due to the contradictious proposition of free market entry and the profit incentive of innovation: "(P)erfect competition is and always has been temporarily suspended whenever anything new is being introduced – automatically or by measures devised for the purpose – even in otherwise perfectly competitive conditions" (Schumpeter 1942: 105). Therefore, the realisation of an ideal of perfect competition could obstruct the development process even on the level of the firm. Static efficiency considerations on organisational slack, for instance, would conflict with an evolutionary strategy, exemplified by the creation of excess capacity in the anticipation of innovation (Schumpeter 1942: 105n).[22]

This aspect of competition underlines again the discontinuous character of economic development:

> "In so far as the 'new combinations' may in time grow out of the old by continuous adjustment in small steps, there is certainly change, possibly growth, but neither a new phenomenon nor development in our sense. In so far as this is not the case, and the new combinations appear discontinuously, then the phenomenon characterising development emerges. (...) Development in our sense is then defined by the carrying out of new combinations" (Schumpeter 1934: 65n).

Five types of these "new combinations", that is innovations, were accordingly reconsidered:

> "(1) The introduction of a new good – that is one with which consumers are not yet familiar – or a new quality of a good. (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not been previously entered, whether or not this market has existed before. (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created. (5) The carrying out of the new organisation of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position" (Schumpeter 1934: 66).

It is noteworthy, that the degree of novelty associated with these types of innovation does not depend on a universal account of their originality, but on the specific routines and experiences of the involved economic agents. This aspect is immensely important for a distinction between innovation, imitation and assimilation. In case one, that is the introduction of a new good, the degree of novelty depends on the familiarity of consumers with that good. In case two, the new method of production, experience in the concerned branch of manufacture is emphasised. Cases three and four, the opening of new markets and the use of new sources of inputs, take issue with the matter of novelty

[22] Accordingly, Schumpeter suggested that unemployment as an alleged waste of resources needed to be viewed in connection with economic evolution and structural change, and not from the point of view of a stationary economy (Schumpeter 1946a: 805n).

in terms of the routines of the innovating firms and industries. In both cases it is not the difference between existence and creation which matters, but the specific use in a new way. Case five, the reorganisation of competitive structures within industries, finally points at industrial organisation.

Still, as far as a technological illustration of Schumpeter's perspective is concerned, his most favoured example of innovation as an evolutionary force remained the case of "railroadization" as a major discontinuous innovation, emphasising the disruptive leap of institutional routines, technological standards and established demand patterns as a characteristic of the development process:

> "It is that kind of change arising from within the system which so displaces its equilibrium point that the new one cannot be reached from the old one by infinitesimal steps. Add successively as many coaches as you please, you will never get a railway thereby" (Schumpeter 1934: 64).

A particularly more applied account was presented in the "Business Cycles", addressing more explicitly the organisational dimension of innovation:

> "We include the introduction of new commodities which may even serve as the standard case. Technological change in the production of commodities already in use, the opening up of new markets or of new sources of supply, Taylorization of work, improved handling of material, the setting up of new business organizations such as department stores – in short, any "doing things differently" in the realm of economic life – all these are instances of what we shall refer to by the term Innovation" (Schumpeter 1939: 84).

The explicit mentioning of Taylorist principles in the production process may reflect the contemporary experience of industrial organisation in the automobile industry of the United States, as represented by the Ford company which evolved as a role model of industrial strategy in that sector. The contemporary emergence of large enterprises which were able to hold monopoly positions, based on temporary technological and organisational advantages, then may have underlined the analytical relevance of these aspects.

Indeed, it has been argued that Schumpeter's discussion of the relationship between market structure and competition in the "*Theorie*" differed markedly from the exposition of that topic in later works like "Capitalism, Socialism and Democracy". There it is no more the newly founded firm in a competitive environment which is taken to the fore as the decisive organisational form of entrepreneurial intervention, but the established large-scale enterprise with its potential for exercising monopoly power. Indeed, Schumpeter proclaimed a competitive superiority of large enterprises with regard to technological efficiency, exercised in the "monopoloid species" of capitalism:

> "The firm of the type that is compatible with perfect competition is in many cases inferior in internal, especially technological, efficiency. If it is, then it wastes opportunities. It may also in its endeavours to improve its methods of production waste capital because it is in a less favourable position to evolve and to judge new possibilities" (Schumpeter 1942: 106).

Thus, according to Schumpeter's argumentation, it is no more the expectation, but the actual exercise of a monopolistic position, that serves as a major incentive for innovation (Scherer 1992: 1417n).[23]

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[23] The related interpretation of this so-called "Schumpeterian hypothesis" on the causal relationship between R&D, innovation and competition claims that monopoly power is positively correlated with the innovation performance of enterprises. Thus a market structure that contains large firms endowed with market power would be more conducive to technological change than a market structure that approaches perfect competition (Kamien and Schwartz 1982: 19). However, in this context, a monopoly position with

Nonetheless, Schumpeter's acknowledgement of the developmental impact of monopoly power in industrial innovation also accounted for the assumption of an ongoing emergence of new entrepreneurial ventures, forcing their entry on established markets as well as establishing new markets, and thus periodically reviving the market process in capitalist development (Rosenberg 1994: 46n). Indeed, when Schumpeter emphasised the role of large enterprises, he did not alter his theoretical orientation but modified his approach in accordance with a changing historical context, in which industrial evolution was increasingly shaped by large enterprises which performed professional research by establishing in-house laboratories as an organisational innovation.

However, beyond that matter of routines and technologies, Schumpeter's modelling of innovation accounts for the argument that economic processes may be abstracted analytically from money only in the setting of the circular flow, whereas economic development is essentially based on the complementing components of innovation and credit (Schumpeter 1926a: 66). In Schumpeter's theoretical system this means that innovation, competition and the monetary sphere are conceptually linked, as development theory exhibits a characteristic monetary dimension. Hence, crucial development phenomena to be explained and the related theoretical categories to be constructed are settled in the monetary sphere or explained in terms of monetary concepts. This applies to the matter of credit, interest and capital as monetary phenomena, while their combination with the innovation process contributes to the explanation of entrepreneurial profit and at last allows for an theoretical analysis of the business cycle mechanism.

Credit denotes the creation of purchasing power for entrepreneurs, who, according to the theoretical format, generally do not command receipts of earlier periods as a means of financing innovation (Schumpeter 1926a: 148). Indeed, according to Schumpeter's theory, credit is not a phenomenon of the circular flow, for the latter type of economic process with its accustomed mode of production has no use for borrowing financial means, as expenses are covered by current receipts. The problem of reallocating productive resources from their established use to new combinations is relevant only in the context of economic evolution. There it is solved by means of credit, that is the creation of purchasing power for entrepreneurs, contributing to the outbidding of competitors on factor markets. In agreement with that argumentation, saving funds are only of secondary importance, representing an effect rather than a cause of development, whereas the creation of new funds, as exercised within the banking system, becomes a factor of primary importance. Hence, it is not the transformation of existing purchasing power but the creation of new purchasing power that matters for financing innovation (Schumpeter 1926a: 108n).

Interest on that credit amount for financing innovations then denotes a price paid for a permit to acquire commodities without having contributed other commodities to activities within the economic system before (Schumpeter 1939: 123).[24] The absence of

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prices set above marginal costs may be established only temporarily, thus underlining differences with Cournot monopoly. The thesis of "Schumpeterian competition" then maintains that efficiency losses in a static setting may be compensated by efficiency gains of a temporary monopoly position in a dynamic setting, based on the carrying out of innovations. In proceeding with that interpretation, Schumpeter may have overstated the advantages of large firms (Scherer 1992: 1430).

[24] The essence of that scheme is already outlined in "*Wesen*", as Schumpeter emphasised the case of interest on loan to be used for "the creation of new industries, new forms of organisation, new technologies, and new consumption goods" (Schumpeter 1908: 417). Moreover, credit-creation was presented as a case analogous to the introduction of novelty in production (Schumpeter 1908: 417n). The

innovation in the circular flow also informed the corresponding notion of a zero rate of interest, originally directed against Böhm-Bawerk's intertemporal theory of interest with its assumption of a positive rate of time preference, yet also rejecting the Wicksellian differentiation between natural and monetary rates of interest. According to Schumpeter, only the latter would represent a crucial developmental phenomenon (Schumpeter 1939: 127n). Still, at least in the "Business Cycles", Schumpeter claimed that his monetary theory of interest would be compatible with any other theoretical perspective (Schumpeter 1939: 123). Indeed, the thesis of zero interest in the stationary economy has been interpreted as a marginal topic in Schumpeter's development model (Samuelson 1981: 13).

Capital operates as a monetary fund of purchasing power, created by banks and transferred in the form of credit to entrepreneurs, enabling them to acquire factors of production for carrying out innovations (Schumpeter 1939: 129n). The Austrian roots of this approach are underlined by references to the late Menger's monetary theory of capital and his definition of capital as an amount of money productively used in the economic process (Schumpeter 1954: 899).[25] Yet another facet of Schumpeter's capital theory points at aspects of economic power which have been prominent with Wieser too, yet the were originally put forward by Marx. Schumpeter suggested: "Capital is nothing but the lever by which the entrepreneur subjects to his control the goods which he needs, nothing but a means of diverting the factors of production to new uses, or of dictating a new direction to production" (Schumpeter 1934: 116). References to Marxian value theory even underlined that capital would reflect a specific social relationship of domination (Schumpeter 1926a: 195n). However, a major difference between both perspectives rests upon the fact that, unlike Schumpeter's monetary approach, the Marxian concern with capital indicates the technological essence of production (Frison 1998: 112).

Entrepreneurial profit should represent a temporary premium put upon successful innovation, primarily based on cost-related competitive advantages (Schumpeter 1939: 104n). This means that the essence of entrepreneurial profit lies in its role as a premium on pioneering innovative initiative. Moreover, paralleling Keynesian claims that acts of investment precede the formation of savings, Schumpeter maintained that entrepreneurial profits necessarily serve as a pool of savings within the economic system (Schumpeter 1926a: 301). The decisive impact of entrepreneurial profit as a material incentive in the development process points to the analytical relationship between innovation and competition beyond the zero profit positions of Walrasian general equilibrium. It follows: "As value is a symptom of our poverty, so profit is a symptom of imperfection" (Schumpeter 1934: 31).

Schumpeter illustrated the mechanism of innovation-driven development in the context of his two-phase cycle scheme in "*Theorie*" by the example of a model economy with prevalent segments of manual labour in the textile industry. The first phase, namely prosperity, witnesses an entrepreneurial agent who carries out innovations, as he

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creation of new purchasing power could be used for "new creations", constituting a major incentive for stepping out of the equilibrium state to make an "unusual effort" (Schumpeter 1908: 420).

[25] Additionally, it has been argued that a distinct scheme of a money-capital circuit is available both in Schumpeter and Marx. In Marx's "*Kapital*" the scheme of capitalist commodity production is denoted by the circuit *M–C–C'–M'* where *C* and *M* denote the commodity and money forms of capital, while *C'* and *M'* denote the commodity and money form of capital plus the surplus value that is generated in production and realised in circulation, then returning to the money capital form (Bellofiore 1985: 21n). Hence, the money form of capital is a point of departure as well as designation in the Marxian accumulation scheme. This corresponds with Schumpeter's thesis of credit creation as a first step and the repayment of credit loans as a final step in the development cycle.

imagines the opportunities for introducing mechanical looms, irrespective of the question whether these need to be constructed by himself or by others. The necessary amount of capital is borrowed from a bank. These new looms provide productivity advantages which contribute to lower costs per unit of output, allowing for competitive advantages. Due to the additional demand of pioneering entrepreneurs, factor prices increase, thus unfolding inflationary pressures that contribute to a reallocation of the means of production away from traditional competitors. Finally, the output of entrepreneurial producers is sold at established prices of the stationary state, yet the lower costs of production which result from the adoption of new production methods allow for the realisation of entrepreneurial profit.

The second phase, namely recession, sets in with the market entry of further competing firms, which are also endowed with the production method of mechanical looms, attracted to the textile industry by the original profit opportunities. This leads to a comprehensive restructuring of the whole industrial sector, accompanied by increasing output levels, yet also combined with monetary processes. As credits are repaid, interest levels approach once more the equilibrium position of the circular flow. Moreover, deflation sets in with the general application of the new production methods, then completing the restructuring procedures with their competitive elimination of unfit firms. However, entrepreneurial profits are competed away, while the economy approaches a position where price formation in competitive equilibrium is reconstituted (Schumpeter 1926a: 209n). This implies that temporary monopoly may be understood as an economic engine of development; a thesis that accompanies the developmental functions of entrepreneurship and credit-creation as outstandingly imaginative aspects of the Schumpeterian approach.[26]

The conceptual combination of these restructuring processes, both in technological and monetary terms, with the time-specificity of innovation leads to Schumpeter's most elaborate explanation of the business cycle pattern in economic development. Indeed, according to the corresponding model, innovations are neither isolated events nor equally distributed in time. Rather, they are said to cluster in time, industry and space (Schumpeter 1939: 100n). Clusters of innovation, reflecting the impact of pioneering entrepreneurship and disruptive innovation, would therefore provide the decisive impulses for fluctuations of economic activity. Consequently, Schumpeter underlined the role of major breaks in economic development on an international scale, pointing to cases like the railroadisation of an economy:

> "In fact, it is now easy to realize that those disturbances must necessarily be 'big', in the sense that they will disrupt the existing system and *enforce a distinct process of adaptation* which should show up as such in any time series material. (...) But in many cases comprising historically important types, individual innovations imply, by virtue of their nature, a 'big' step and a 'big' change. A railroad through new country, *i.e.*, country not yet served by railroads, as soon as it gets into working order upsets all conditions of location, all cost calculations, all production functions within its radius of influence; and hardly any 'ways of doing things' which have been optimal before remain so afterward. The case may be put still more forcibly if we consider the railroadization and the electrification of the whole world as single processes" (Schumpeter 1939: 101, emphasis in original).

[26] Moreover, Schumpeter's conceptualisation of credit-creation and inflation during prosperity provided an original contribution to theorising on economic development that would even allow for mercantilist positions (Streissler 1981: 69n). Again, the underlying coincidence with Keynesian positions points to the impact of monetary processes.

The corresponding model of the cyclical contours of the development process, as presented in its most elaborate form in the "Business Cycles", with the four phases of prosperity, depression, recession and recovery that were applied to the particular types of the Kitchin, Juglar and Kondratieff cycles, represents a strand of the fixed-capital investment framework, promoted most prominently by Tugan-Baranovsky and Spiethoff, among others.

Schumpeter then analysed the complexity of business cycles by three "approximations". The first approximation takes issue with prosperity and depression in a two-phase scheme. The model assumes that evolutionary change is set in motion by the pioneering activity of an entrepreneur who sets up a new firm, using financial funds borrowed from a bank. The market entry of further entrepreneurs and the ensuing competition for factors of production leads to inflationary pressure, while the entrepreneurial firms benefit from cost advantages that are related to their innovations. Some established firms may also benefit from the business opportunities provided by the "new economic space", although the competing down of firms and the restructuring of industries prevails (Schumpeter 1939: 131n). Hence the economic system responds to entrepreneurial impulses by redirecting the economic system from an established to a new "neighborhood of equilibrium" position. Consequently, these "neighborhoods of equilibrium" demarcate the phases of disequilibrating prosperity and re-equilibrating depression (Schumpeter 1939: 137n).

The second approximation accounts for a "secondary wave" of economic activity, driven by the reactions and speculations of established firms. Its effects may outrun the process of re-equilibration. Moreover, the persisting effects of preceding cycles are recognised, while the assumption of perfect competition is relaxed. The gradual process of economic growth comes into play, allowing for the effects of saving, the diffusion of credit resources, the expansion of investment opportunities, the impact of externalities caused by innovation, as well as the problem of unemployment (Schumpeter 1939: 158n). Accordingly, the two-phases scheme is extended to a four-phases scheme of prosperity, recession, depression and recovery, with disequilibration in the first and third phase, as well as equilibration in the second and fourth phase (Schumpeter 1939: 149n). The demarcation of an individual cycle begins with the "neighborhood of equilibrium" preceding the prosperity phase and ends with the corresponding "neighborhood" position following recovery (Schumpeter 1939: 156).[27]

The third approximation adds simultaneous cyclical layers, namely the forty months Kitchin cycle, the ten years Juglar cycle, and the sixty years Kondratieff cycle. Historically, the first Kondratieff should range from the eighties of the 18th century to 1842, the second Kondratieff should cover the span from 1842 to 1897, whereas the third Kondratieff was said to have taken off in 1898 (Schumpeter 1939: 169n). Still, these historical dates were meant only as tentative approximations, for Schumpeter emphasised that the irregularity of innovation obstructed any notion of regularity in the timing of these phases (Schumpeter 1939: 174). Nonetheless, at least a pattern of economic progress underlying the cyclical contours of the development process should be identified, as reflected by the long-run tendency of declining price levels (Schumpeter 1939: 947).

Beyond these formal aspects, however, a critical assessment of Schumpeter's theorising needs to account for the often neglected yet definitely crucial role of its institutional dimensions. Schumpeter's business cycle model, for instance, refers exclusively to a

[27] Thus points of inflexion defined by $dx/dt>0$ or $dx/dt<0$ and $d^2x/dt^2=0$, with x as an indicator of economic activity and t as time index, constitute the distinct analytical foci in Schumpeter's business cycle scheme, not the upper or lower turning points defined by $dx/dt=0$.

competitive phase of capitalism with private property, private business initiative and the corresponding money, credit and banking system, paralleled by specific attitudes and habits within the banking community and the industrial bourgeoisie (Schumpeter 1939: 144n). This is accordance with Schumpeter's claim that business cycles as historically specific phenomena would be inherently related with capitalism, perceived as a private property economy in which innovations are carried out by means of credit. In theoretical terms, this corresponds with the general proposition that economic processes may be analytically abstracted from the monetary sphere only in the setting of the circular flow, whereas the evolutionary process of capitalist economic development would be necessarily based on the interplay of innovation and credit (Schumpeter 1926a: 66). Hence, those theoretical categories designed to explain business cycles, capital, credit, interest and entrepreneurial profit as crucial development phenomena are mainly settled in the monetary sphere, while these phenomena are perceived as historically specific features of modern capitalism. Thus, Schumpeter's approach to economic development provides above all a theory of capitalist economic development.[28] The neglect of the resultant historical specificity has been largely responsible for the persistence of grave misconceptions surrounding the interpretation of Schumpeter's theorising, including a lack of attention for the ideological content in the underlying vision of capitalist development.

An assessment of the historical specificity of Schumpeterian thought may indeed benefit from the notion of vision that was put forward with regard to controversies on the impact of ideological commitments and normative values on theory formation and research procedures, as discussed during the "*Werturteilsstreit*" in German social sciences. Schumpeter argued that ideologies needed to be taken into account especially in the social sciences, for, unlike mathematics and physics, their domain of experience would be variant to historical change. While scientific research may be free of distortions, due to its logical underpinnings, ideological bias is rather rooted in the perception of the phenomena to be analysed, allowing for different approaches in the face of a similar set of scientific problems. Schumpeter then claimed that scientific analysis would be preceded by pre-scientific cognitive acts, visualising a distinct set of coherent phenomena as the raw material for further analytic efforts which could result in the elaboration of a model in which relations among those phenomena were formulated (Schumpeter 1949a: 348n). Accordingly, intuitive "vision" should refer to the "first perception or impression of the phenomena to be investigated" (Schumpeter 1954: 570). As a result, science and ideology are intertwined, for Schumpeter claimed: "Analytic work begins with material provided by our vision of things, and this vision is ideological almost by definition" (Schumpeter 1954: 42).

A reconsideration of the vision of economic development held by particular theoretical approaches then contributes to an assessment of their analytical direction, as illustrated by classical controversies of stagnationist pessimism and developmental optimism concerning the sustainability of economic growth (Schumpeter 1954: 570n). In view of that, the specificity of Schumpeter's position may be approached by comparing the underlying vision with the perspective of a decisive theoretical as well as ideological opponent, namely Keynes. Although both Schumpeter and Keynes perceived the monetary sphere of capitalist market economies as the decisive terrain for economic coordination, disagreement prevailed with regard to their actual understanding of the

[28] This is confirmed by Schumpeter's remark that the universalism of pure theory could not grasp the specificity of capitalist economies, hence it would not provide a theory of capitalism (Schumpeter 1908: 166n). Accordingly, the latter was an analytical mission associated with the theory of economic development.

economic process, reflecting conflicting developmental visions that highlighted the institutional essence of modern capitalism.

Keynes portrayed modern capitalism as an economic system based on a historically specific motive force, namely a money-oriented acquisitive spirit of economic activity (Keynes 1926: 293). According to Keynes, industrialisation in the modern age of capitalism marked a "great age of science and technical inventions", fuelling productivity gains which would allow for the possibility that "mankind is solving its economic problem" (Keynes 1930: 323n). Indeed, Keynes predicted an "age of leisure and abundance" beyond economic scarcity and the motivational drive for accumulation that allegedly characterised capitalist evolution, implicitly promoting a vision of capitalism as a negative point of reference for an Aristotelian utopia (Keynes 1930: 328). However, the matter of innovation was largely neglected in the short-run perspective of the "General Theory", as Keynes elaborated primarily on problems of effective demand in the context of the Great Depression.[29] The associated stagnationist perspective involved policy proposals with a focus on public spending in countering the declining marginal efficiency of capital and vanishing investment opportunities, addressing the need for a regulation of the inherently unstable capitalist economic process (Keynes 1936: 325n).

In summary, Keynes held theoretical positions that were typically denounced by Schumpeter as planning-oriented "anti-saving" ideologies which would articulate an institutional decomposition of modern capitalism.[30] Schumpeter's criticism then addressed the construction of models that would operate with aggregate variables based on simplistic microeconomic assumptions, an aspect related with the short-term horizon of Keynesian analysis, yet even worsened by the direct application of its results to policy practice.[31] In particular, Schumpeter's criticism took issue with the Keynesian assumption of invariant production functions which seemed to limit the analytical range of Keynes's "General Theory":

> "The capitalist process is essentially a process of change of the type which is being assumed away (...), and all its characteristic phenomena and problems arise from the fact that it is such a process. A theory that postulates invariance of production functions may, if correct in itself, be still of some use to the theorist. But it is the theory of another world and out of all contact with modern industrial fact, unemployment included" (Schumpeter 1936: 793).[32]

Consequently, major segments of the Schumpeterian vision were essentially opposed to the Keynesian position.

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[29] The latter was at first interpreted as a consequence of rapid change in a new economic period, for labour-saving technical efficiency would outpace labour-absorbing capacities and thus lead to "technological unemployment", aggravated by an inefficient monetary system (Keynes 1930: 321n).

[30] Interesting differences are also to be observed biographically. Keynes: a progressive figure head of the Cambridge milieu, where he was educated and spent his academic career, successful as a theorist, policy adviser and businessman, a lover of the arts and artists. Schumpeter: a conservative relict of the imperial Viennese milieu, a stranger in the diverse academic environments of Graz, Bonn or Harvard, a critically acclaimed theoretical economist, yet a failure both as politician and banker, haunted by tragedies in his private affairs and struggling until the end of his life for a workable integration of his comprehensive research programme.

[31] Compared with Schumpeter's analysis of the modern state which accounted for self-interested agents involved in policy-making, Keynes actually exhibited a rather naive perception of government as the executive organ of social welfare considerations (Starbatty 1985: 73n).

[32] Furthermore, Keynes was criticised for providing not a general theory, as proposed, but rather a very narrowly designed approach. Components like the propensity to consume, liquidity preference and the marginal efficiency of capital would represent merely a vision of the "characteristics of England's ageing capitalism as seen from the standpoint of an English intellectual" (Schumpeter 1954: 41n).

While Schumpeter's analytical concern was directed at the matter of business cycles, he explored problems of economic development in relation to innovation and entrepreneurship. In his theoretical scheme, innovations would provide a renewal of investment opportunities as they revolutionise supply conditions and demand patterns, hence the Keynesian scenario of stagnation was rejected. This implied that Schumpeter was not prepared to follow Keynes in hailing a post-capitalist utopia where human needs would develop more freely beyond the narrow domain of economic activities with their irrational connotations of material acquisition. In this normative case, Keynesian sentiment was closer to the perception of reason in the "realm of freedom", envisaged by Marxian positions. Schumpeter, however, whose arguments stressed the persistence of irrationality, embraced a cultural pessimism that emphasised bureaucratisation and rationalisation as components of cultural demise, adhering to a conservative philosophy of history that was critical of the social content and moral values of both capitalism and socialism (Schumpeter 1941: 345). Nonetheless, regarding the analysis of real processes, the Schumpeterian perspective on economic development referred to Marxian ideas regarding the "vision of economic evolution as a specific process which is produced by the economic system itself" (Schumpeter 1926a: XXIV).

This perspective shaped as well Schumpeter's arguments on economic stability and change in capitalism. According to the Keynesian position, an unstable system, reflecting certain business conditions, may undermine the stability of the corresponding institutional order, thus underlining the requirement for stabilisation by adequate policy measures. Schumpeter, however, claimed that the instability of the capitalist economic system would not destabilise its institutional order, for both were closely related with each other (Schumpeter 1928b: 384). Indeed, instability is characterised as a fundamental characteristic of capitalism, synonymous with a process of innovation-driven restructuring: "Capitalism is essentially a process of (endogenous) economic change (...) The atmosphere of industrial revolutions – of 'progress' – is the only one in which capitalism can survive. (...) In this sense stabilized capitalism would be a contradiction in terms" (Schumpeter 1939: 1033). Rather, in the Schumpeterian view of the development process, it is the stabilisation of the capitalist economic system, based on rationalisation and bureaucratisation, which may contribute to a decomposition of its institutional order. In summary, then, the Schumpeterian vision of economic development emphasises the dynamism of innovation and competition in capitalist development, as expressed by the categories and causal relationships that constitute the corresponding theoretical framework. Again, this concern with evolutionary change involves a historical specificity of the underlying analytical orientation that needs to be reconsidered in an assessment of the Schumpeterian perspective.

2.3 SOLVING THE SCHUMPETERIAN PARADOX: HISTORY AND INSTITUTIONS IN ECONOMIC ANALYSIS

Controversies regarding a classification of Schumpeter's theoretical and methodological positions have been stimulated by the apparent paradox of a simultaneous advocacy of general equilibrium theory and institutional approaches to economic evolution, reflected by the support of both mathematical and historical research methods (Andersen 1994: 5). Although these methods should be associated with distinct levels of abstraction, and hence different areas of economic analysis, still it remains difficult to assess the consistency underlying these proposals. Indeed, the comprehensiveness of

Schumpeter's theoretical endeavours, ranging from price formation to parliamentary democracy, makes an evaluation quite challenging. At first glance, however, the observed paradox may be rooted in the diversity of theoretical influences on the theory of economic development, which constitutes the analytical core of Schumpeterian efforts. These influences have been outlined to include classical political economy and Marxian theory, the Austrian School of Viennese origin, the Anglo-Saxon neoclassical approach as stimulated by J. B. Clark, the Lausanne School with its Walrasian orientation, and the German Historical School, as represented by Sombart and Max Weber (Perroux 1965/1993: 69n). The decisive point is, that all of these contributions to Schumpeterian thought need to be associated with specific domains of economic analysis. Hence, the Schumpeterian paradox that has been pinpointed may be solved in terms of methodological pluralism.

In particular, given Schumpeter's repeated appraisal of Walrasian theory, which was also paralleled by an approval of J. B. Clark's marginal productivity theory of distribution as a hallmark of marginalism, the neoclassical traits in Schumpeter's theorising are unquestionable. This is of course related to the reasoning on methodological individualism in static economic theory, as put forward most emphatically in "*Wesen*". However, these neoclassical positions remain critical components of Schumpeter's theorising due to problems in their consistency, especially with regard to their empirical content. Accordingly, Schumpeter's use of equilibrium as a theoretical norm has been confronted with the empirical practice of identifying only two equilibrium "neighbourhoods" per century as components of the historical profile of the Kondratieff cycles, hinting at the persisting impact of comparative statics in Schumpeter's business cycle theory (Schefold 1986b/1997: 515n).[33] Corresponding claims have pinpointed the combination of neoclassical marginalism with evolutionary theorising on innovation and competition, arguing that Schumpeter's Walrasian leanings overshadowed his evolutionary contributions (Hodgson 1993: 140n). A more accurate account, however, would have to differentiate between the institutional analysis of economic evolution and its formalisation. In this context, Schumpeter's emphasis was of course on the former, meant to complement abstract equilibrium theory (Andersen 1994: 5).

A related tension between static and dynamic components, confronting abstract and institutional analysis, marks Schumpeter's relationship with Marxian theory. Indeed, apart from the fact that Schumpeter adhered to the economic feasibility of bureaucratic socialism, his development theory parallels Marxian concerns with economic processes that drive the "motion of capitalist society" (Rosenberg 1994a: 41n). Among the most prominent Marxian themes in Schumpeterian thought excel the topics of industrial concentration, economic crises and institutional decline, all of them derived from the Marxian theory of capitalist development and transferred to the Schumpeterian domain of economic evolution (Rosenberg 2000: 8). Therefore, while Schumpeter's neoclassical preferences in static theory were at odds with the Marxian labour theory of value and its political implications, the perception of technological restructuring and institutional change in economic development echoed Marxian ideas. Viewed in this way, Schumpeter's reflection of Marxian positions are expressed by his focus on a process-oriented theory of capitalist evolution, contrasting with the neoclassical analysis of abstract economic universals (Bottomore 1992: 35).

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[33] A related argument suggests that Schumpeter's references to neoclassical marginalism were inappropriate for an exact analysis of technical change, due to the lack of a consistent theory of production (Pasinetti 1981: 19).

These arguments indicate once more that Schumpeter attempted to combine the abstractions of pure theory with an applied mode of analysis that should recognise the variety of institutional and structural forms in economic development. This brings Schumpeter's position close to the tradition of the German Historical School, and indeed, hints at its sustained impact on Schumpeter's thought are ubiquitous. Indeed, Schumpeter's "Business Cycles" have been categorised as one of the most important monographs of the Historical School; a statement supported by the fact that the matter of business cycles has been a prominent historist concern ever since Roscher's pioneering contributions (Streissler 1994: 37n). A similar argumentation, yet on rather methodological grounds, points to the conceptual nexus that connects Schumpeter's approach with Max Weber's ideas, based on historist positions concerning socio-cultural development (Shionoya 1997: 202n). Thus the paradox which arises from seemingly contradictory positions in Schumpeter's research agenda may be resolved by recognising the plural character of that agenda which allows for a recognition of institutional components that are appropriately viewed in the context of the German Historical School (Ebner 2000a: 356n).

The decisive methodological considerations which lie at the outset of Schumpeter's research programme produce an instrumentalist position which regards the results obtained from a certain theory as a criterion of validity, viewing procedures of fact-finding and theoretical elaboration as interdependent (Shionoya 1991: 207n). This allowed for a rejection of controversies on induction versus deduction, as well as on explaining versus understanding in the methodological foundations of the social sciences. These debates stimulated the "*Methodenstreit*" between Carl Menger, founding father of the Austrian School, and Gustav Schmoller, figure head of the German Historical School; a controversy that would shape Schumpeter's methodological positions. Regarding the problems of induction versus deduction, then, the question was examined whether economic theories, reflecting universal laws, should be grounded primarily on empirical or logical evidence.[34]

Menger's argumentation has been interpreted as a methodological dualism, distinguishing between an atomistic position, suitable for the abstractions of economic theory, especially price theory, and an organicist position with an empirical orientation, dealing with problems of institutional change, as exemplified by the evolution of wants (Krabbe 1993: 157n). This would imply a distinction of "exact laws" as universal representations of the invariant essence of economic phenomena, and "empirical laws" as an expression of empirical patterns and tendencies that could be applied to aggregate analysis. Indeed, this controversy was also occupied with sorting out appropriate research objects, confronting an aggregate analysis of industrial evolution, as implied by historist positions, with the individual level of choice and allocation that was advocated by marginalism (Hutchison 1973: 34n). Indeed, the "*Methodenstreit*" also indicated a

[34]A point of departure was provided by the Cartesian postulate of a unitary science, in which theory should uncover universal laws based on the supremacy of mind over matter. An axiomatic logic of abstract reasoning would be superior to empirical observation, corresponding with a rejection of organicist holism in claiming that objects of inquiry should be deconstructed to their invariant elements. The inductive approach, as presented among others by John Stuart Mill, postulated that scientific investigations begin in the unprejudiced observation of facts and proceed with inductive inference from empirical material to reasoning on regularities, resulting in the formulation of universal laws. Yet the problem arises, how to proceed from particular cases to universal laws in the face of uncertainty (Blaug 1980: 16n). Deductivism gained influence with the positivist claims of Mach and Poincaré, proposing that scientific explanations have a common logical structure. This would allow for theorising as a tool of prediction (Blaug 1980: 2n).

confrontation of holism and atomism as epistemological perspectives that were related with the positions of historism and marginalism (Dopfer 1988: 556n).
This aspect leads to the differentiation of explaining versus understanding as methodological devices. Indeed, the controversy between Schmoller and Menger had originally taken off with Schmoller's unfavourable review of Menger's "*Untersuchungen*", instead praising Dilthey's hermeneutical positions (Salley 1993/1994: 88n).[35] The latter were rooted in Vico's humanist confrontation with Cartesianism. In modern terms, Schleiermacher's concept of hermeneutical interpretation and Droysen's historical approach to a context-oriented investigation of purposeful human action informed Dilthey's postulate of a methodological autonomy of humanities, that is "*Geisteswissenschaften*" (Addleson 1995: 80n). "*Verstehen*" should denote a subjective mode of interpretative understanding, conceptually framed by a "philosophy of life" that addressed history as comprised of human actions, hence, unlike nature, it was believed to be accessible to subjective understanding (Oakley 1997: 91n).
The neo-Kantian methodology of Rickert and Windelband then differentiated ideographic sciences like history, concerned with individual events, and nomothetic sciences like physics, concerned with the laws of nature. Only man-made cultural manifestations of history could be objects of human understanding. Therefore it was asserted that the epistemology of the individualising cultural sciences should be distinct from the generalising natural sciences (Oakley 1997: 128n).[36] However, assessing human actions by putting them into a meaningful historical context already posed problems of intersubjective transferability and testability. Related difficulties in addressing objective cultural values as a means of understanding historical phenomena led Max Weber to the construction of ideal types as stylised heuristical devices which could not be found in empirical reality, suggesting that individual motives should be approached in terms of rule-guided behaviour (Weber 1904/1922: 191n).
At this point, Schumpeter's notion of methodological individualism comes into play, originally reflecting the methodological position of Walrasian theory, yet refined in terms of a persisting concern with economic development which contributed to the outstanding role of historical and institutional analysis in his consideration and application of the tools of economic analysis. In this sense, Schumpeter's standpoint echoes problems of integrating theory and history that had shaped the "*Methodenstreit*", yet exceeding the domain of methodological individualism and marginalist analysis, as it allowed for a reconsideration of historist ideas.
It has been proposed that Schumpeter became acquainted with moderate historist approaches at the University of Vienna, during his studies with historian and statistician Inama-Sternegg. Schumpeter's first publications were seminar papers on statistical

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[35] In particular, Schmoller emphasised the historically conditioned character of economic theory, that is, its cultural relativity which was underlined by Dilthey, quite in contrast to Menger's theoretical universalism that seemed to spring from an unjustified generalisation of Western European experiences in the evolution of modern market economies (Schmoller 1883: 247). The latter argument was refined by Polanyi, who pointed out that the first edition of Menger's "*Grundsätze*", published in 1871, committed the "economistic fallacy" of equating the universal of human economy with a historically specific form of market exchange. Still, revisions for a second edition, posthumously published in 1923, seemed to allow for non-market ensembles of institutions that embed economic activity (Polanyi 1977: 20n). This would imply that Menger moved at last towards a set of problems which characterised Schmollerian concerns.
[36] Menger's perception of this methodological dualism resembled positivist arguments, as he claimed that a reduction of natural phenomena to their invariant elements would lead to the empirically inaccessible level of atoms and natural forces, while an advantage of the social sciences would lie in the reduction of social phenomena to an empirically accessible level of individual action (Menger 1883: 156n).

methods that appeared in the journal "*Statische Monatsschrift*" in 1905. The underlying historist inspiration seems to have also informed an unfinished thesis on the evolution of direct taxation that should provide material for later work in fiscal sociology. However, Schumpeter's focus of attention shifted soon towards abstract theorising (Andersen 1991a: 17n).[37] Schumpeter himself claimed that his attention focused on the analysis of economic crises ever since 1905. Even in this case he could draw on readily available historist and Marxist contributions, while Juglar's business cycle theory was discussed in Inama-Sternegg's statistics seminars, which Schumpeter used to visit (Yagi 1994: 39n).

In the context of these intellectual developments, Schumpeter suggested that the "*Methodenstreit*" could be considered as pointless, for the standing of theory and history should be appreciated according to the actually confronted problems and perspectives (Schumpeter 1908: 7). However, from early on, Schumpeter's approach to static theory was accompanied by the rejection of a methodological separation of cultural and natural sciences, favouring instead a methodological "Monroe doctrine" of economics that should safeguard its further development (Schumpeter 1908: 536). Schumpeter's promotion of mathematical formalism in static theory then deviated from the Mengerian tradition, as he subscribed to Jevons's suggestion that the scientific character of economics as a discipline which analyses quantitative relations would rely on its use of mathematics (Schumpeter 1906: 47).[38] Still, the notion of methodological individualism, presented as a bedrock of static theory, was presented in Mengerian terms. Indeed, Schumpeter argued that theorising in the social sciences, including economics, was intimately related with the practice of resolving a phenomenon into its various constitutive elements in order to study each of these elements separately with the aim of disclosing regularities (Schumpeter: 1915b: 558).

The corresponding notion of methodological individualism was distinguished from political individualism with its liberal implications as well as from the individualist focus of sociological analyses that would explore various types of behaviour (Schumpeter 1908: 90n). Indeed, Schumpeter's methodological individualism suggests that economic analysis may proceed with the assumption of a given behaviour of individuals without having to analyse additionally the causes of that behaviour (Schumpeter 1954: 888n). The hedonistic egoism associated with figure of the "homo oeconomicus" was thus rejected, underlining the Walrasian position that psychological or sociological arguments should be excluded from the domain of static economic theory (Schumpeter 1908: 85).[39]

The rejection of the "*Methodenstreit*" expressed Schumpeter's conviction that economic theory needed to be paralleled by complementary methods of economic analysis. However, at least as important as that methodological viewpoint, from early on Schumpeter's line of reasoning also referred to the matter of economic development which needed to be investigated by analytical means beyond the domain of static

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[37] Inama had also adopted Hildebrand's scheme of development stages, characterising the stage of "credit economy" as a concept that would cover essential features of the modern economy (Krabbe 1996a: 86). Schumpeter's theory of economic development accounts for the institutional framework of such a credit economy, and hence it is no surprise that Schumpeter explicitly acknowledged Inama-Sternegg's merits as an academic teacher (Schumpeter 1954: 813).

[38] Jevons had justified mathematical formalism with the argument that economics would deal with quantities, hence its laws and relations needed to be mathematical in nature (Jevons 1871/1970: 78).

[39] In a similar way, Pareto justified theoretical abstraction with reference to physics: "Rational mechanics, when it reduces bodies to simple physical points, and pure economics, when it reduces real men to the *homo oeconomicus*, make use of completely similar abstractions, imposed by similar necessities" (Pareto 1927/1972: 12).

theory. Rather, historical theories should be applied to the corresponding dynamic problems (Schumpeter 1908: 18). These statements pointed to the matter of historical and institutional analyses which were perceived as fundamental components of theoretical as well as empirical work on economic development. Theory, that is basically static theory, used to dominate in early works like "*Wesen*", while the role of history increased significantly with the shift of attention towards economic development, as the relationship between theory, history and historical theories became a most prominent topic (Schumpeter 1926a: 92n).[40]

Indeed, outlined most detailed in the "History of Economic Analysis", Schumpeter identified the particular fields of economic history, statistics and economic sociology as techniques of economic analysis that should accompany economic theory.[41] Theory, denoted as a "box of tools" in Joan Robinson's words, would provide simplifying models in analysing the causal content of economic phenomena. History, however, was appreciated as the most important analytical technique due to the proposition that economics deals with unique processes in historical time, enforcing an analytical command of institutional facts and historical experiences. Statistics was said to be necessary for coping with the formulation of research hypotheses and explanative schemes (Schumpeter 1954: 12n). Economic sociology then denoted a fourth technique of economic analysis, dealing with the analysis of institutions in the process of economic development (Schumpeter 1954: 21).[42]

The arguments on the necessity of proceeding with a historical approach to economic change included the request for detailed comparisons of the development of firms and industries beyond merely impressionistic descriptions (Schumpeter 1935: 10). Consequently, the priority of historical analyses that was promoted in the "Business Cycles" referred above all to the area of industrial history:

> "General history (social, political, and cultural), economic history, and more particularly industrial history are not only indispensable but really the most important contributors to the understanding of our problem. All other materials and methods, statistical and theoretical, are only subservient to them and worse than useless without them" (Schumpeter 1939: 13).

The application of comparative historical studies to firms and industries and an assessment of economic change as an evolutionary process and seemed to complement each other. Indeed, Schumpeter claimed that the character of economic development as an organic process would enforce the necessity of viewing every component of that

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[40] Furthermore, just before the Harvard research programme on the statistical analysis of business cycles was established, Schumpeter seemed to believe that econometrics would provide the most appropriate analytical tools. Hence, in his farewell speech at the University of Bonn in June 1932, he suggested that statistics as a technique of economic analysis was of unparalleled importance, proclaiming that, given the situation he were to study again, he would begin with theory and the study of statistical methods (Schumpeter 1932: 605). This temporary turn to econometrics was soon overshadowed by a reconsideration of the priority of historical analysis.

[41] Accordingly, Schumpeter denounced the "*Methodenstreit*" once more: "Since the there cannot be any serious question either about the basic importance of historical research in a science that deals with a historical process or about the necessity of developing a set of analytical tools by which to handle the material, the controversy, like all such controversies, might well seem to be us to have been wholly pointless" (Schumpeter 1954: 814).

[42] With this subdivision of disciplines Schumpeter was not alone, and he was not even in a pioneering position, as indicated for instance by Jevons' related efforts (Steiner 1995: 182n). Indeed, in the second edition of his "Theory of Political Economy" Jevons distinguished the disciplines of commercial statistics, mathematical economic theory, systematic and descriptive economics, economic sociology and fiscal science. However, all of them were to be based on general principles of self-interest and utility (Jevons 1871/1970: 49n).

process of change, namely the individual firm and industry, in its evolutionary context (Schumpeter 1942: 83n).[43]

Schumpeter then even argued in his late remarks on business cycle research that the causal nexus between innovation, competition and industrial evolution should be pinpointed by means of historical studies which would allow for the impact of entrepreneurship and other qualitative factors, instead of an exclusive focus on econometric aggregate analysis:

> "To let the murder out and to start my final thesis, what is really required is a large collection of industrial and locational monographs all drawn up according to the same plan and giving proper attention on the one hand to the incessant historical change in production and consumption functions and on the other hand to the quality and behavior of the leading personnel" (Schumpeter 1949d/1951: 314).

This was in accordance with the suggestion that the evolutionary character of economic change impeded the usefulness of aggregate analysis:

> "(T)he most serious shortcoming of modern business-cycle studies is that nobody seems to understand or even to care precisely how industries and individual firms rise and fall and how their rise and fall affects the aggregates and what we call loosely "general business conditions" (Schumpeter 1949d/1951: 315).

A further methodological implication of that position is the acknowledgement of the historical specificity of institutional patterns and economic regularities, obstructing the formulation of universal laws on economic development:

> "We have to recognize, in this as in other respects, that we are dealing with a process subject to institutional change and therefore must, for every historical period, see whether or not our model, however faithfully copied from the history of other periods, still fits facts" (Schumpeter 1939: 96n).

Therefore Schumpeter acknowledged the specific epistemological character of economic theories with regard to their subject matter: "The historical or 'evolutionary' nature of the economic process unquestionably limits the scope of general concepts and of general relations between them ('economic laws') that economists may be able to formulate" (Schumpeter 1954: 34). Given the positivist optimism of early works like "*Wesen*", this mature position of Schumpeter's implicitly reflected a reconsideration of ideas that had been prevalent with the German Historical School.

Moreover, endowing historical perspectives with such an extended methodological role should promote the integration of theoretical and historical concerns by means of historically-minded theorising. Schumpeter portrayed an elaboration of this perspective as a research priority:

> "Since what we are trying to understand is economic change in historic time, there is little exaggeration in saying that the ultimate goal is simply a reasoned (= conceptually clarified) history, not of crises only, nor of cycles or waves, but of the economic process in all its aspects and bearings to which theory merely supplies some tools and schemata, and statistics merely part of the material" (Schumpeter 1939: 220).

The proposal of elaborating on a "reasoned history" pointed to economic sociology as a distinct technique of economic analysis, denoting a typified, stylised or reasoned

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[43] As historical concerns and an evolutionary understanding of economic change seemed to reinforce each other in Schumpeter's arguments, the opinion has been expressed that history indeed constitutes the essential subject matter of Schumpeter's works, dealing with economic evolution in historical time (Rosenberg 2000: 3).

economic history. It should transcend the assumption of given behaviour, that is the guiding principle of methodological individualism: "economic analysis deals with the questions how people behave at any time and what the economic effects are they produce by so behaving; economic sociology deals with the question how they came to behave as they do" (Schumpeter 1954: 21). Schumpeter illustrated this approach to economic sociology with explicit reference to "German practice", mentioning Colm's works and the term "*Wirtschaftssoziologie*". Remarkably, Max Weber's related notion of "*Sozialökonomie*" was introduced as a German complement to the more comprehensive notion of economics in Marshall's "Principles", covering historical, statistical and theoretical techniques (Schumpeter 1954: 21).

The distinction of economic sociology and economic theory then mirrors the difference between a treatment of institutions as an endogenous or an exogenous factor in the economic process:

> "By 'economic sociology' (the German *Wirtschaftssoziologie*) we denote the description and interpretation of – or "interpretative description" – of economically relevant institutions, including habits and forms of behaviour in general, such as government, property, private enterprise, customary or 'rational' behaviour. By 'economics' – or, if you prefer 'economics proper' – we denote the interpretative description of the economic mechanisms that play within any given state of those institutions, such as market mechanisms" (Schumpeter 1949b: 203n).

Analysing the variety of economic motives and types of behaviour should contribute to an exploration of the institutional and organisational aspects of the economic process: "Economic sociology covers, first, the facts of economic behavior from which economists forge certain assumptions and, second, the institutions that characterize the economic organization of the societies to be studied" (Schumpeter, 1954: 544). Institutional analysis involves actions and motives, meanings and interpretation, that is the matter hermeneutical methods in economic analysis. Schumpeter highlighted these aspects by invoking the methodological distinction of explaining and understanding economic phenomena: "Economics lacks the benefits that physics derives from laboratory experiments (...) but enjoys instead a source of information that is denied to physics, namely, man's extensive knowledge of the *meanings* of economic actions" (Schumpeter 1954: 16, emphasis in original). The basic intention of that perspective was pointed out with regard to Max Weber's interpretative sociology: "There is no sense in asking what the falling stone is about beyond stating the law of its fall. But there is sense in asking what a consuming household is about" (Schumpeter 1954: 818n).

Still, recognising essential differences between the explanation of nature and the understanding interpretation of cultural phenomena as a useful epistemological device should not imply the acceptance of a methodological dualism. Schumpeter actually rejected the neo-Kantian dichotomy of natural and cultural sciences, as he claimed that the complexity of the social sciences would reach across such a demarcation (Schumpeter 1954: 777). Instead, he tended to advocate a positivist view on the econometric measurement of objective relationships among goods and prices in regular form, yet acknowledging problems in approaching the ends-means relationships of economic action, for these would not be accessible to measurement (Schumpeter 1940/1991: 320n).

Furthermore, Schumpeter reasoned that the results of empirical measurement procedures on an aggregate level would reveal only partial information on phenomena containing a much higher degree of complexity. In particular, the further use of this

partial information in the domain of policy-making would be misconceived. This should pinpoint the limits of empirical positivism in informing economic policy, yet also invoking the "Ricardian vice" of drawing policy conclusions from abstract theorems; a criticism that was of course directed against the contemporary procedures of Keynesian macroeconomic analysis:

> "Theorists – especially of the 'planning' type – often indulge in the deplorable practice of deriving 'practical' results from a few functional relations between a few economic aggregates in utter disregard of the fact that such analytic set-ups are congenitally incapable of taking account of deeper things, the more subtle relations that cannot be weighed and measured but may be more important to a nation's cultural life than the things that can. 'Organic' considerations are perhaps the most obvious antidote – though in themselves hardly an adequate one – against such uncivilized procedure" (Schumpeter 1954: 788n).

This position differs markedly from earlier statements on the positive characterisation of formal methods in static theory. Its impact for theorising on economic growth and development essentially reiterated historist arguments, as Schumpeter maintained that a mathematical growth theory, formalising single factors of growth, would face the problem of quantifying the underlying variety of interdependent elements that cause economic growth: "(I)f we tried to use mathematics, we would immediately run up against the difficulty that some of the most important of these interdependent factors cannot be quantified" (Schumpeter 1947b: 4n). Given the fact that Schumpeter was also a pioneering contributor to econometrics, this position was meant to underline once again the necessity of a historically-sensitive institutional analysis of entrepreneurship in the development process.

In summary, it is thus fair to state that Schumpeter's research program was influenced by historically-minded institutional concepts from early on, persistently dominating the analysis of economic development, although the prevalence of formal methods in terms of mathematics and econometrics temporarily overshadowed the corresponding methodological pluralism that allowed for historist approaches. Indeed, an inspection of Schumpeter's works reveals a crucial conceptual relationship with positions of the German Historical School, as expressed by the appreciation of history and economic sociology in Schumpeter's account of analytical techniques. Moreover, Schumpeter's general vision of economic development also seemed to reflect historist concerns, in particular based upon Schmoller's research program on socio-cultural evolution, labelled as the *Schmollerprogramm* of the German Historical School by Schumpeter himself (Schumpeter 1926b: 18). Indeed, Schumpeter's historical and institutional analysis of capitalist development, as manifest in the "Business Cycles", retained fundamental elements of the Schmollerian agenda, still modifying these elements in a way that would allow for proceeding with a unique conceptual framework, highlighting economic development and evolutionary change (Ebner 2000a: 356n).

3 THE HISTORIST IMPACT ON SCHUMPTERIAN THOUGHT

3.1 APPROACHING THE "SCHMOLLERPROGRAMM" OF THE GERMAN HISTORICAL SCHOOL

In addition to the domain of history, the approach of economic sociology, meant as a particular analytical technique that should contribute to an exploration of the institutional dimension of economic development, indeed signifies the sustained impact of the German Historical School on Schumpeter's research program. It has been suggested that its identifiable intellectual roots in the German Historical School were basically shaped by Schmoller's contributions, as well as by a related tradition of cultural sociology represented by Dilthey, Max Weber, Alfred Weber, and Mannheim (Shionoya 1997: 50n). Based on this association of Schumpeterian economic sociology with the German Historical School, Shionoya has identified a "Schmoller-Weber-Schumpeter nexus" as a reflection of that relationship (Shionoya 1997: 202n). This conceptual nexus should remain valid despite obvious methodological differences, illustrated for instance by the controversy on value judgements, the "*Werturteilsstreit*", in which Schmoller's policy orientation was confronted by Max Weber, while the latter's notion of ideal types met Schumpeter's persisting scepticism. Indeed, concurring claims by Swedberg have maintained with a slightly different focus of attention that Schumpeter's economic sociology emerged from the works of the "Youngest Historical School", that is primarily Max Weber, Werner Sombart and Arthur Spiethoff, whose position is correctly portrayed as an attempt to overcome the division of theory and history in the aftermath of the "*Methodenstreit*" (Swedberg 1989: 510n).
However, apart from the regrettable neglect of Sombart and Spiethoff both in Shionoya's and Sweberg's expositions, Shionoya's notion of economic sociology actually covers the range of a multidisciplinary unitary framework for the social sciences, resembling the term "*Sozialökonomie*", that is socio-economics, whereas the character of economic sociology according to Swedberg resembles a specialised sub-discipline, quite in accordance with Schumpeter's original intentions. Accordingly, the appreciation of economic sociology as a specific method for the analysis of economic institutions needs to position Schumpeter's theorising in the context of sociological and institutionalist thought, primarily accounting for the matter of economic behaviour (Smelser and Swedberg 1994: 12n). Moreover, recent arguments on the impact of the German Historical School on the Schumpeterian perspective have pinpointed evolutionary change as a component of historically-minded analyses that affected Schumpeter's vision of economic development as a socio-cultural process (Ebner 2000a: 356n).
Facing this recent upsurge in academic attention, it is nonetheless fair to state that the economic ideas of Gustav Schmoller, the German Historical School's major scholar, was largely ignored for the past decades.[44] An impertinent kind of folk wisdom had evolved, distorting Schmoller's original positions by claiming that he rejected analytical

[44] The renewed interest in Schmollerian ideas covers an extensive area of economic thought, yet as far as the current bibliographical impact is concerned, its focus is of course on the domains of economic sociology and institutional economics (Peukert 2001: 71n).

abstraction and formal theorising in favour of a merely descriptive approach; an impression that has factually concealed the essential positions of the German Historical School (Backhaus 1993/1994: 9n). Indeed, it has been suggested by Schefold that it is not a lack of theoretical orientation which characterises the Schmollerian agenda, but rather the rejection of empirically unfounded abstract theory in favour of an agenda of comprehensive empirical research which should inform an applied type of theorising (Schefold 1989a: 78n). Regarding an interpretation of the essence of Schmoller's research program, thus, a variety of historical, empirical, ethical, and policy-oriented segments has been distinguished (Backhaus 1993/1994: 10n).

Most of these components could be set in relation with effects exercised by the pre-Schmollerian generation of historist scholars. In fact, not only the Schmollerian generation of the Historical School, but also the first generation of the Austrian School owed much to earlier debates within German historism; a case that has been argued most convincingly regarding Menger's affirmative references to Roscher (Streissler 1990: 156n).[45] Indeed, Roscher excelled together with Hildebrand and Knies as a representative of the "Older Historical School" in establishing a specific tradition of historically-minded economic research, then pioneering the "historical method" in political economy (Salin 1967: 132n).[46] As Schumpeter explained, Roscher's approach basically rejected normative and speculative arguments, taking instead the historical method as a positive empirical approach (Schumpeter 1954: 540). This empiricist methodology was combined with a stages theory of economic development that would adhere to an evolutionary unfolding of socio-economic progress. In epistemological terms, his research program aimed to formulate universal laws of economic development (Spengler 1973: 209n).

Schmoller, however, elevated the historical approach in political economy to its intellectual zenith, not to mention the high tide of its academic influence (Priddat 1995: 28n). According to Schumpeter's evaluation, his approach differed from predecessors like Roscher in perceiving the historical method not as a broad impression of the historical flow of events, but rather as a prescription for elaborating on the individual material in terms of detailed historical studies. Furthermore, Schmoller distanced himself from Roscher's leanings towards organic preconceptions which seemed to unsettle the intellectual foundations of research (Schumpeter 1914: 99n). Still, expressing a parallel epistemological concern, the historical method according to Schmoller should denote an attempt to chart the general cultural development of peoples, nations, civilisations and thus at last the whole of humankind (Schmoller 1893/1898: 261).

Concerning the methodological components of the historist tradition, as embraced by Schmoller, a major postulate demanded that economic phenomena were to be viewed as historically conditioned and embedded in a specific cultural context. This argument was paralleled by the organicist idea that the appropriate objects of inquiry should be

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[45] Intellectual predecessors of historist thought in political economy were to be found primarily in the Historical School of Law with its anti-rationalist stance, as endorsed by Savigny, who accentuated the organic coherence of society as a source of national specificity; a perspective that was also discussed in detail by Menger during the controversy with Schmoller (Eisermann 1956: 84n).

[46] However, it has been proposed that List stood out as an intellectual founder of the German Historical School, even before Roscher, for he pointed at the institutional differences between national economies and their development patterns, thus outlining a concern that should become typical for the emerging historist orientation (Hodgson 2001: 57n). In general, it is reasonable to follow the well-established suggestion that the German Historical School was rooted in a nationalist blend of romanticist idealism, meant as an intellectual reaction to rationalist enlightenment, mirroring the situation of a latecomer economy (Shionoya 2001: 8n).

coherently growing and developing entities of various interdependent elements that needed to be understood with reference to the complex whole they were part of. It is related to the historist idea of historical individuals as distinct entities in the development process, settled on an aggregate level of analysis (Betz 1988: 412n). Indeed, Schumpeter summarised his assessment of the Schmollerian perspective in the German Historical School by six points: first, the historical relativity of theoretical insights; second, the unity and "*Gestalt*" character of social life, where all constitutive elements are interdependent and not to be isolated; third, the variety of economic motives encompassing rational as well as non-rational aspects; fourth, the evolutionary and developmental perspective; fifth, the interest in a detailed analysis of individual research objects; sixth, the anti-mechanistic, organicist point of view (Schumpeter 1914: 110n).

In his essay "*Gustav v. Schmoller und die Probleme von heute*" from 1926, Schumpeter set out to acknowledge the merits as well as limits of the "*Schmollerprogramm*" in detail. He argued that it would seek to grasp the essence of history itself, aiming for the integration of a general sociology with a universal history, basically by approaching the material by means of a minimum of apriori, then finding relationships and patterns, which could enrich the apriori for further analyses. This procedure would denote an attempt of grasping history by the means of history" (Schumpeter 1926b: 45n). In the "History of Economic Analysis", Schumpeter then suggested that the underlying conception of the historical method would presuppose a supremacy of historical techniques in approaching the formulation of general patterns and types of causation (Schumpeter 1954: 807n). Schmoller's use of the historical method could contribute to revealing the "organic coherence" that shapes the process of economic development, although it might lack analytical precision (Schumpeter 1954: 813).[47]

In detail, the analytical procedure suggested by Schmoller should encompass empirical observations, the formulation of definitions and classifications, and finally the reconstruction of patterns as well as the elaboration of causal explanations (Schmoller 1901: 100). According to these leanings towards induction, Schmoller never abandoned the idea that exhaustive comparative research strategies might uncover a sufficient amount of empirical regularities which could at last guide the formulation of historical laws of socio-economic development; a notion that would contrast with the essence of the hermeneutical perspective (Dopfer 1988: 556n). However, Schmoller also stated in this context that he would not embrace the neo-Kantian distinction of natural and cultural sciences, maintaining that the domain of political economy, that is "*Volkswirtschaftslehre*", would reach across these hypothetical disciplinary boundaries (Schmoller 1893/1898: 224n).

This standpoint also constituted the analytical core of Schmoller's notion of political economy which should integrate institutional and technological aspects, hence affecting both the domains of the natural and the cultural (Schmoller 1893/1898: 223).

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[47] Schumpeter criticised an overstretching expansion of the Schmollerian approach most explicitly in the "History of Economic Analysis": "Nothing in the social cosmos or chaos is really outside of Schmollerian economics. In principle, if not quite in practice, the Schmollerian economist was in fact a historically minded sociologist in the latter term's widest meaning" (Schumpeter 1954: 812). This argument restated the analytical domain of the Schmollerian approach in Schumpeter's system of economic techniques. The image of Schmollerian economics was thus refuted, quite in contrast to Schmollerian economic sociology. However, it may be supposed that these comments also echoed an uncomfortable academic situation. In an interview with the "Harvard Crimson" from 11 April 1944, Schumpeter described his research program as a "comprehensive sociology", noting that all his failures were due to the observance of this program, for it seemed to pose an obstacle to concentrating on more promising yet narrow research topics (Shionoya 1997: 308).

Underlying these arguments was the thesis that economic processes were necessarily based on "natural-technological" factors upon which a layer of "psychological-moral" factors would unfold; an argument that implicitly resembled the Marxian approach to the dialectics of productive forces and productive relations, yet with a focus on the institutional aspects of the problem (Schmoller 1874-75/1898: 57). Indeed, Schmoller's historical perspective implied a reconsideration of institutional factors in economic development, in particular acknowledging the plurality of individual motives that shape economic behaviour. Therefore, it was said to demand an analysis of those factors that were treated as data by conventional economic theory, principally institutional features like the behaviour of social groups and individuals (Schumpeter 1926b: 17n).
In order to delineate the sphere of institutions as an embedding framework for economic action, they were to be distinguished from organisations, then denoted as "organs":

> "By a political, legal, economic institution we mean a particular order of community life, which acts as the solid vessel for the agency of generations for centuries and millennia, serving certain purposes, having reached an autonomous development. Every institution represents the sum of conventions and the rules of morals, custom and law, which have a common centre or purpose, interdependent among each other, building a system. (...) By the formation of organs we mean the personal side of the institution; marriage is the institution, family is the organ" (Schmoller, 1901: 61, translation by author).

Schmoller then postulated on the role of institutional change in the process of economic development, viewed from a broadly socio-cultural perspective:

> "(It) is based on the development of the human being in general, that is especially on a development in the direction of increased economic capabilities and moral attitudes as well as on the formation of larger and more complicated, consistently better instituted societal economic organs and communities" (Schmoller 1904: 748, translation by author).

Economic development involves an evolutionary process of various developmental stages according to an organicist sequence of increasing complexity that resembles the Spencerian scheme of evolution. This notion of increasing complexity is set in relation to the factor of economic interdependence, for the criteria that classify an individual stage correspond to the degree of economic interdependence among the economic parties involved. The latter is indicated by the degree of the division of labour and its technological as well as infrastructural foundations which define the range of the relevant economic unit. Historically, in the case of Western Europe, this scheme should range from local subsistence economies to national economies which are integrated by international markets, equivalent to the evolutionary pattern of a growing organism that includes the particular stages of the village, town, regional-territorial, and national economy (Schmoller 1904: 764).
A decisive analytical concept of Schmoller's approach is thus constituted by the notion of "*Volkswirtschaft*", that is the national economy as a specific developmental stage of economic and socio-cultural evolution. In accordance with Schmoller's twin concept of material and non-material factors it represents a specific whole, grounded on certain psychological, that is intellectual and instinctive motives, as well as on a particular system of institutions and organisations, including the modern state, accompanied by distinct socio-economic structures and specific natural-technological conditions. This is why Schmoller put forward the thesis that economic phenomena would represent integral parts of the general pattern of an economy, and that they should be analysed as

such, for an isolating type of analysis would miss essential functions in their multifaceted context (Schmoller 1893: 220n).[48]
Therefore, it is not a surprise that the approach to static economic theory presented in Schumpeter's "*Wesen*", introducing the notion of methodological individualism, received fierce criticism by Schmoller and other representatives of the Historical School. By using arguments that were also familiar with their Austrian counterparts, the decisive thrust was directed at Schumpeter's Walrasian attempt to address economic phenomena by abstracting from the behaviour of economic agents, for no value relation between goods could ever exist without the involvement of human motivation, judgement and action. Hence, Schmoller denounced Schumpeter's static theory as a faulty application of methods suitable only for the natural sciences, by doing so also invoking Wieser's Austrian disapproval (Schmoller 1911: 449n).
Schmoller's institutional focus confronted materialist concepts of economic development, primarily hinting at the Marxian concept of capitalism, yet also pinpointing its modifications in post-Schmollerian contributions within the German Historical School, like those of Sombart. With reference to the notion of capital as an analytical criterion for characterising an economic formation, Schmoller thus argued:

> "Capital plays certainly a great role in the economy as well as in the modern firms of today, but this is going to be explained only psychologically, by the men of a particular time, race, group of nations, and their spiritual powers, furthermore by the psychic results of these powers, the ideas and moral systems of the time, customs and law, institutions of the time" (Schmoller 1903: 144, translation by author).

Instead, Schmoller favoured the notion of the "machine age" as an appropriate label for the economic process under the dominance of industrial production. The developmental essence of that industrial "machine age" would lie in the introduction of machines to the production process, replacing craftsmanship by engineering. According to Schmoller, this process of industrial mechanisation and technological change was accompanied by a spread of scientific professions, rooted in an institutional expansion of technological education since the 19th century (Schmoller 1901: 211). The resulting economic dynamism drives an institutional and structural differentiation which shapes the whole organisation of economies and societies, contributing to their overall socio-cultural character (Schmoller 1901: 218n). In particular, Schmoller singled out families, enterprises and the state as a terrain of transformation in the institutional evolution of the modern economy (Rosegger 1988: 595n).[49] Accordingly, Schmoller's notion of technology could be sensed as an endogenous factor of economic development, mediating between the natural dimension of resource endowments and the cultural dimension of institutions and organisations (Schmidt 1993/1994: 391). Based on these ideas, Schmoller struggled with concepts of history, evolution and progress, both in

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[48] Schmoller's notion of "*Volkswirtschaft*" as an aggregate concept with holistic implications constituted a major topic in the *Methodenstreit*, as Menger claimed that it would not represent an independent entity, hence, it could not be subject to exact theorising. Again, this was meant as a refutation of holism in economic analysis (Yagi 1997: 242n). However, Menger's parallel affirmation of organicism in Savigny's German Historical School of Law echoed his distinction of organically evolving institutions that result unintentionally from individual action and pragmatically established institutions which are designed by a collective will. The former pointed to Menger's theory of institutional evolution, whereas the latter seemed to reflect constructivist moments of Schmollerian *Socialpolitik* (Yagi 2001: 88n).
[49] Moreover, Schmoller dealt with technology in the context of unemployment phenomena, basically discussing problems of technological unemployment. This matter contributed to his postulate of an ethical regulation of technological change in the "machine age" (Schefold 1989b: 266n).

economic and socio-cultural terms, to be perceived as common ground with the Schumpeterian analysis of economic development.

3.2 SCHMOLLER'S EVOLUTIONARY APPROACH TO ECONOMIC CHANGE

Schumpeter distinguished several types of evolutionist thought that had shaped economic ideas in the 19th century: first, "philosopher's evolutionism" represented by Hegelian emanatist philosophy of history; second, "Marxist evolutionism" as a materialist philosophy of history; third, "historian's evolutionism" represented by the theories of developmental stages in List, Roscher, Hildebrand, and Knies; fourth, "intellectualist evolutionism" originally formulated in Comte's theses on the perfection of human intellect; fifth, "Darwinian evolutionism" as a genuinely biological perspective (Schumpeter 1954: 436n). Various combinations of these diverse strands of thought influenced evolutionary modes of theorising on economic development that were widely held within the German Historical School.

Schmoller, in particular, differentiated mechanical-materialistic and idealistic approaches to the analysis of economic development. He favoured a non-mechanistic position, for the seemingly natural process of socio-economic evolution was said to be regulated by the impact of cultural progress, characterised by a substitution of pure instincts by intellectual insights, as indicated by customary norms. Schmoller's approach thus may be subdivided into ethical and evolutionary segments, pointing at specific sources of change. The ethical aspect denotes a historically-sensitive perception of institutional change which is based on ideas of ethical progress. Corresponding policy implications would express normative concerns with problems of social cohesion in the course of rapid economic change, shaping the orientation of Schmollerian *Socialpolitik*.[50] The evolutionary aspect, however, denotes the dynamism of market competition, basically reflecting instinctive motives. Indeed, despite a reluctance concerning the use of naturalist metaphors, evolutionary arguments prevailed in Schmoller's developmental analyses, applying terms such as "struggle for existence" and "survival of the fittest" to the selective function of market competition and economic change (Schmoller 1904: 46).

Schmoller then postulated a reconciliation of market dynamism and social justice, as reflected by the argument of an embeddedness of profit motives in the ethical spheres of moral fairness. Accordingly, even the most primitive modes of market exchange would be based on a sentiment of closeness, thus promoting mutual trust (Schmoller 1901: 37n). The interplay of nature-based instinct and culture-based intellect, understood as distinct motive forces in driving economic development, may allow for interpreting Schmoller's self-labelled "ethical-historical" ideas in terms of an ethical-evolutionary approach (Ebner 2000a: 361n). Indeed, according to Schmoller, the particular evolutionary and ethical dimensions of economic and socio-cultural change would be transmitted by the mediating mechanisms of competition and co-operation. Thus Schmoller arrived at the position that market competition as a kind of natural selection, resulting in the survival of the fittest, should be contrasted with an institutional regulation of economic life, based on the progress of intellectual insights, framed by

[50] In this context, *Socialpolitik* was meant as a reform-oriented response to the challenges of German industrialisation and the emergence of a specific "Social Question" that was posed by impoverishment and social disintegration (Ebner 2003b).

social conventions.[51] It may be argued that the dichotomy of natural competition and cultural co-operation as mechanisms of economic progress in Schmoller's scheme would be paralleled by the institutional functions of variety, as a precondition of evolutionary selection, and coherence, as a condition of progress in ethical norms and values. Figure 3.1 sketches these basic components of Schmoller's concept of evolution and progress.

Figure 3.1: Schmoller's scheme of economic development

Features	**Evolutionary Progress**	**Ethical Progress**
Metaphorical Domain	*Nature*	*Culture*
Motivation	*Instinctive Habits*	*Customary Morals*
Mechanism	*Competitive Selection*	*Cooperative Interaction*
Functional Basis	*Variety*	*Coherence*

This scheme of economic progress should not allow for historical determinism, and it also opposed the idea of a final stage of history in terms of a Hegelian "end of history", for Schmoller maintained on the unpredictability of socio-cultural development: "Any judgement on the forms of social organisation of the future includes a judgement on the future of technology and a judgement on psychological-moral instincts of future generations. And both of these factors are uncertain at all rates" (Schmoller 1874-75/1898: 118, translation by author).

This emphasis on the undetermined course of economic development underlines Schmoller's persisting efforts in breaking away from Spencerian influences which proceeded with a deterministic and atomistic account of socio-cultural evolution, claiming the existence of a universal evolutionary tendency that would direct the structure of objects from homogeneity to heterogeneity.[52] Likewise controversial from a historist viewpoint, the Spencerian principles eliminated individual creativity and spontaneity as historical forces (Redlich 1964: 83n). Therefore, Schmoller recognised that the Spencerian argumentation needed to be combined with an appreciation of cultural aspects, pinpointing human action, framed by custom, convention and social learning capabilities in order to arrive at a historically-sensitive conceptualisation of socio-cultural evolution (Schmoller 1901: 66).

Schmoller thus insisted on the creative role of outstanding individuals as an internal development factor.[53] This type of heroic individuals, well-known from political historiography, included the example of entrepreneurial business leaders (Schmoller

[51] Curiously, this points to an argument that was also prominent with Marxism. Engels' "*Anti-Dühring*" of 1878 contrasted a seemingly natural struggle for existence in the "realm of necessity", based on private property and commodity production, with deliberately regulated economic life in the "realm of freedom", based on socialised means of production and insights in the laws of economic motion (Engels 1878/1970: 264). However, in contrast to the Marxian belief in economic self-organisation beyond markets, Schmoller wanted to preserve competitive market processes within a framework of social regulations.

[52] Indeed, the Spencerian position contradicted the population-thinking of the Darwinian approach with its perception of evolutionary change as an undetermined process (Hodgson 1993: 88n).

[53] This view was put forward not only in contrast to Spencerian evolutionary theorising, but also as a counter-position to Schäffle's organicist development theory with its vitalist emphasis on the liveliness of organisms, promoting the vision of an evolutionary perfectibility of societies as increasingly diversified "social bodies" (Hutter 1993/1994: 182n).

1901: 413n).[54] In particular, the "impact of great men" was identified as a research device in development analysis, for Schmoller suggested explorations in psychological and intellectual profiles of economic agents in order to gain further insights in the ethical forces of production and distribution (Schmoller 1893/1898: 286n). In accordance with that orientation, Schmoller's definition of the entrepreneur was straightforward: "The one who takes the initiative, bearing risk under private law, is the entrepreneur; he is the centre and the head of the enterprise" (Schmoller 1901: 413, translation by author).

Individual initiative, risk-bearing and leadership capabilities resemble the regular basics of Schmoller's approach to entrepreneurship, quite in agreement with a common characterisation of entrepreneurial profit as a premium on talent, effort and directive performance (Schmoller 1874-75/1898: 130). Entrepreneurs in large enterprises, for instance, seemed to be endowed with specific capabilities of speculation and organisation, based on an energetic spirit that involves also a characteristic ruthlessness. Hence, Schmoller emphasised that all those who were "born to command", would range among the most successful entrepreneurs (Schmoller 1904: 430n). Yet Schmoller neither defined nor explored the causality underlying the entrepreneurial function by means of a specific theory beyond a common understanding of creative action as a historist key concern (Redlich 1964: 87). Moreover, quite in contrast to the Austrian as well as late classical German strands of theorising on entrepreneurship, yet in agreement with the scheme of evolutionary and ethical segments in the institutional dimension of economic development, Schmoller's position exhibited a normative ambiguity, for entrepreneurs could promote socio-cultural decomposition and decline, well in addition to their organisational and speculative capabilities. The entrepreneurial stimulation of economic improvements such as rising productivity levels and living standards would go hand in hand with the spread of material greed, at last resulting in social disintegration (Schmoller 1901: 430).

Consequently, entrepreneurship should be embedded in an institutional framework that could regulate its dynamising functions while blocking any disintegrating effects. This was illustrated with reference to the "*Gründer*", namely entrepreneurial founders of business enterprises and financial ventures who profited from financial expansion after the German Empire was established in 1871. Schmoller pointed out that entrepreneurs who combined professional attitude with organisational responsibility would generate social welfare on an equal scale with "generals and secretaries of state", although most business ventures set up in the "*Gründer*" era were denounced as swindle (Schmoller 1874-5/1898: 106). The use of government agents as a comparative standard underlined once more Schmoller's scepticism regarding entrepreneurship in the private sector.

Yet another aspect of entrepreneurial activity was traced in social restructuring, fuelled by technological innovation and competition, typical for the industrialised "machine peoples" of Western Europe and the United States:

> "New leading, ruling, enjoying, power and wealth partly appropriately partly incorrectly using strata rose up, the remaining declined therefore correspondingly, fell behind, were partly pushed, lost through the competitive struggle with those rising up. This applies to the machine peoples as well as to the leading entrepreneurs, engineers and merchants internal to them" (Schmoller 1901: 221, translation by author).

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[54] Indeed, German philosophy of history since the middle of the 19th century had been marked by a trend for replacing Hegelian metaphysics by an individualist philosophy of history, represented by Treitschke's emphasis on the developmental role of "great men", reflected by the slogan of "men making history", as well as by Dilthey's thesis of outstanding individuals as driving forces of history (Redlich 1964: 84n).

Addressing the ethical implications of that process, Schmoller even argued that a loss of moral values on the part of the new entrepreneurial elite had contributed to the deconstruction of the traditional customary order yet without contributing to the establishment of a new one (Schmoller 1901: 225).
With regard to the relationship of Schmoller's ideas with evolutionary thought in contemporary economics, it is noteworthy to consider Veblen as a pioneer of institutionalism, who stated that Schmoller's contributions exhibited an influential account of the evolution of institutions:

> "(T)he distinguishing characteristic of Professor Schmoller's work (...) is that it aims at a Darwinistic account of the origin, growth, persistence, and variation of institutions, in so far as these institutions have to do with the economic aspect of life either as cause or effect.(...) In this line of theoretical inquiry Professor Schmoller is not alone (...); but the seniority belongs to him, and he is also in the lead as regards the comprehensiveness of his work" (Veblen 1901/1994: 264n).

However, apart from the problem of value judgements and related preconceptions that seemed to be part of Schmoller's approach, Veblen joined those critics of the German Historical School who pinpointed an alleged lack of theoretical orientation. In particular, he claimed that Schmoller could not provide a theoretical body of causal explanations of the economic process (Veblen 1898/1994: 58).
In fact, Veblen himself attempted to formulate an evolutionary economics which should provide "a theory of a cumulative sequence of economic institutions stated in terms of the process itself" (Veblen 1898/1994: 77). Institutions were accordingly defined as "prevalent habits of thought with respect to particular relations and particular functions of the individual and the community". They were introduced as subject to historical inertia, for they were "products of the past process, (..) adapted to past circumstances", hence never in accordance with present economic and social requirements (Veblen 1899/1994: 118n). This view on institutional inertia highlights the contradictory relationships between institutionalised habits of thought and patterns of rapid technological progress in the mechanised "machine system" of the modern economy. The elements of knowledge and learning as devices of human action would contribute to that relationship as a driving force of economic change (Veblen 1898/1994: 71).
The allegedly ill-conceived approach of neoclassical marginalism, with its mechanistic account of economic behaviour, was confronted with the argument that human agents should become a primary object of evolutionary inquiry:

> "It is in the human material that the continuity of development is to be looked for; and it is here, therefore, that the motor forces of the process of economic development must be studied if they are to be studied at all. Economic action must be the subject-matter of the science if the science is to fall into line as an evolutionary science" (Veblen 1898/1994: 72).[55]

This position informed Veblen's perception of modern capitalism as a "barbaric spectacle" of competition for financial advantage in an environment of industrial production, based on self-interest, private property and bellicose rivalry (O'Donnell 1973: 200n). Entrepreneurs, stylised as business leaders, were neither seen as outstanding individuals, nor as decisive agents of change, as they would exploit technological opportunities only for monetary gain, thus obstructing a realisation of the socially most beneficial technological choice. Hence, a specific feature of Veblen's

[55] This should counter a neoclassical modelling of economic agents in "hedonistic" terms. Veblen claimed that the "hedonistic conception of man is that of a lightning calculator of pleasures and pains" without taking initiative, without experiencing history, exhibiting "neither antecedent nor consequent", never being "a prime mover" (Veblen 1898/1994: 73n).

approach to entrepreneurship was provided by the denial of its welfare-increasing role. With the ongoing process of industrial concentration, the "captain of industry" becomes the dominant type of entrepreneur, promoting "a casting out of business men by the chief of business men" (Veblen 1904/1958: 29). The general development perspective then pointed to an intensification of the conflict between technological and pecuniary logic in "finance capitalism", indicating that modern capitalism was unlikely to persist in its established institutional shape (O'Donnell 1973: 210n).[56]
Some of these Veblenian motives, like the matter of technological change and finance in corporate enterprises, dealt with developmental problems that were also addressed in Schumpeter's theory. Still, Schumpeter's notion of economic evolution was not concerned with advances of Veblenian institutionalism, which seemed to lack solid theoretical foundations. Rather, the Schmollerian vision of socio-cultural evolution had a sustained effect on the Schumpeterian agenda, despite the gradualism in its conceptualisation of evolutionary change. This mode of dealing with economic development as an gradual process of organic growth had been a characteristic of all the historist theories of development stages. Schumpeter, however, who had been advocating a notion of discontinuous evolution, suggested that Schmoller's approach would most clearly parallel Marshall's gradualist view on evolutionary change (Schumpeter 1926b: 51). Indeed, the dynamisation of economic theory encouraged those evolutionary arguments. For Schumpeter, then, the problem arose how to combine his notion of punctualist evolution with the dimension of historical continuity that was most relevant form the Schmollerian point of view.

3.3 GRADUALISM, PUNCTUALISM AND THE PRINCIPLE OF CONTINUITY

Recent discussions on the rise and decline of historism in Great Britain have highlighted Marshall's attempt of combining a sensitivity for historist perspectives with an elaboration of economic theory (Ebner 2001d: 725n).[57] Epistemological implications of Marshall's sympathy with historist positions have been outlined primarily in the area of the historical specificity of economic theories, sensed as a decisive component of historically-sensitive modes of analysis (Hodgson 2001: 97n). Indeed, in the preface to the first edition of the "Principles" from 1890, Marshall referred not only to Spencer and Hegel, but also to "ethical-historical studies" that could be attributed to the Historical School, in order to mark his argument that the notion of continuous development would excel in modern economic thought (Marshall 1920: ix).
Marshall's standpoint on the gradual nature of economic evolution was presented most explicitly in the preface to the eight edition of the "Principles" in 1920:

> "Economic evolution is gradual. Its progress is sometimes arrested or reversed by political catastrophes; but its forward movements are never sudden; for even in the Western world and in Japan it is based on habit, partly conscious, partly

[56] Veblen subscribed to a scheme of development phases, proposed with reference to "German writers", particularly resembling Hildebrand's approach. The "late-modern scheme of economic life" was portrayed as a "credit economy", dominated by the capital market (Veblen 1904/1958: 75).
[57] The British Historical School has been described as an intellectual tradition biased towards neomercantilist policies, as exemplified by Leslie's and Ingram's propagation of a historical economics that should confront the crisis of "Ricardian orthodoxy" since the 1870s (Koot 1987: 2n). Normative implications in the area of social reform, then primarily coping with Ireland, were also important for Marshall's orientation. Thus socio-economic problems pressing for social reform lay at the root of historism in Britain and Ireland (Hodgson 2001: 66n). Parallels with German *Socialpolitik* are obvious.

> unconscious. And though an inventor, or an organizer, or a financier of genius may seem to have modified the economic structure of people almost at a stroke; yet that part of his influence, which has not been merely superficial and transitory, is found on inquiry to have done little more than bring to a head a broad constructive movement which had long been in preparation" (Marshall 1920: xiii).

Hence, Marshall concluded in classical terms that evolutionary processes followed a pattern of continuous, organic growth: "*natura non facit saltum*" (Marshall 1920: xiii).[58] Furthermore, in the preface to the fifth edition of the "Principles", published in 1907, he combined this suggestion with vitalist arguments: "The central idea of economics, even when its Foundations alone are under discussion, must be that of living force and movement" (Marshall 1890/1920: xiv).

Accordingly, it has been pointed out that the life cycle concept in Marshall's theory of the representative firm was meant to replace mechanical approaches to an equilibration by forces of demand and supply. Instead, equilibrium in the life cycle perspective was envisaged as a balancing of life and decay in terms of organic forces, subject to persisting change in the growth of the firm (Prendergast 1992: 456n). This argument was combined with the introduction of organisation as a distinct factor of production. In this case, Marshallian entrepreneurship should denote the managerial function of exercising organisational capabilities in the context of business enterprises (Walker 1986: 409).[59] Schumpeter rejected the validity of this position, for the role of organisation should be related to routine management, whereas entrepreneurial performance remained the decisive source of economic development (Schumpeter 1939: 93n). This points to the major differences between Schumpeter's punctualist notion of discontinuous evolution and the evolutionary gradualism that was popular with the Historical School as well as with Marshall, referring to processes of organic growth that proceed in small increments (Awan 1986: 38).[60]

From the Schumpeterian perspective, the relationship between radical economic change and socio-cultural evolution, settled on a different historical level of continuity and change, would provide a decisive problem in the conceptualisation of economic development as a historical process. A perception of evolution as progress in reason or ethical standards, expressed in an unfolding sequence of progressing development stages was definitely not in accordance with Schumpeter's position. In particular, Schumpeter rejected the idea of an objective meaning of history and related assumptions on uniform development paths of nations or civilisations, as claimed, among others, by Roscher and other representatives of the pre-Schmollerian "Older" Historical School (Schumpeter 1926a: 88). However, Schumpeter stated that any historical state of things could be explained by making reference to the preceding situation, based on a characteristic degree of variety (Schumpeter 1926a: 88n).

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[58] The notion "*natura non facit saltum*" had been originally proposed by Leibniz in the "Nouveaux essais sur l'entendement", dating from 1765, then formulated as a "law of continuity" (Gerschenkron 1968: 18n).

[59] Indeed, especially Marshall's late works emphasised the local impact of organisation, knowledge and subsidiary industries as source of external economies, while internal economies denoted the corresponding effects rooted in internal organisation and management, dependent on the life cycle of the firms (Prendergast 1992: 455n).

[60] In particular, it has been highlighted that Schumpeter held discontinuous major change stimulated by a small number of entrepreneurs for the relevant phenomenon, whereas Marshall looked for small contributions to gradual economic change, promoted by a large number of competitive enterprises (Loasby 1982: 240n).

Concerning the evolutionary character of historical changes, Schumpeter suggested that history evolved neither in circular nor in cyclical forms that would resemble the mechanistic impression of a constantly swinging pendulum. Accordingly, the aspect of historical individuality was introduced:

> "Social phenomena constitute a unique process in historic time, and incessant and irreversible change is their most obvious characteristic. If by Evolutionism we mean no more than recognition of this fact, then all reasoning about social phenomena must be either evolutionary in itself or else bear upon evolution" (Schumpeter 1954: 435).

The underlying relationship of history and evolutionary biology was already discussed in Schumpeter's "*Wesen.*" There he suggested that historical theories would exhibit major similarities with biology, for both were concerned with the matter of development (Schumpeter 1908: 18). Regarding Marshall's approach to economic evolution, Schumpeter then maintained that biological analogies were to be favoured over mechanical ones, for the equilibrium orientation of the latter could not grasp the matter of progress. Still, Marshall's argument that evolutionary biology could underline the character of economics as a science of life was rejected due to a suspected lack of analytical precision. Actually, Schumpeter put forward the general accusation that intellectual adversaries of rigorous economic theorising in Walrasian terms would tend to count on biology as a means of legitimisation (Schumpeter 1908: 537n). This argument was also prevalent in Schumpeter's criticism of vulgarised biological concepts in economic analysis, pointing to the negative example of a Spencerian biological economics as well as to an economic behaviourism which tended to reduce complex motives to a social reflex. Indeed, metaphysical determinism seemed to have discredited evolutionary perspectives in economics, especially in its historically sensitive branches (Schumpeter 1926a: 88n).

A solution to the problem of integrating aspects of evolutionary change with the historical process, involving the intervention of economic agents, seemed to be provided by the argument that gradual and discontinuous modes of evolution may be applied to distinct levels of historical abstraction. Therefore, complementing the microscopic aspect of evolutionary discontinuity, Schumpeter also presented a macroscopic "principle of continuity" which should emphasise that in social life "every change seems to consist of the accumulation of many small influences and events and comes about precisely by steps so small as to make any exact dating and any sharp distinction of epochs almost meaningless" (Schumpeter 1939: 227). The underlying hint at a cumulative causation of development processes by a variety of interdependent factors echoed once more the impact of historist ideas. In this case, the principle of continuity would express a persisting concern with the development trajectories of national economies in the course of extended historical periods. Hence, Schumpeter's related views resembled once more the Schmollerian agenda.

However, analysing socio-cultural development was crucial for all the Historical Schools, even with regard to a historical perspective on national trajectories of economic change (Ebner 2001d: 725n). Roscher, in particular, approached entire peoples and nations as units of analysis, assuming an organic development cycle of youth, maturity and age, as reflected in the cultural patterns that were to be observed. This would come close to a formulation of universal development laws, as Max Weber critically remarked (Weber 1903-06/1922: 22n).[61] Indeed, according to Roscher,

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[61] Especially the metaphor of a life cycle of plants applied to the development of peoples and nations, seems to be closer to the natural sciences, than to a specific historical perspective which would have to reject the notion of development laws (Priddat 1998: 296n).

economic crises were perceived as an indicator of a declining people or nation. Hence, a socio-cultural cycle would frame the degree of instability that characterises economic processes, driving the dynamism of business cycles (Priddat 1998: 308).
For Schmoller, the emphasis of exposition was clearly on the socio-cultural side of the problem, as he emphasised that cycles of socio-cultural development cycles should be separated analytically from those phenomena which are treated by business cycle theories (Schmoller 1904: 554). In the final chapter of Schmoller's "*Grundriß*", the cyclical character of the development process was presented as a result of the emergence of modern societies, portrayed as increasingly complex and therefore unstable entities, for national economies were shaped by internal social conflicts and class struggles as well as by external policy conflicts in international trade and competition (Schmoller 1904: 465n). Accordingly, the cyclical contours of both economic and socio-cultural development are interdependently associated with a particular historical range, as the rise and decline of nations and civilisations is essentially conditioned by the moral powers of a particular society (Schmoller 1904: 673n).
This notion of interdependence, promoting the unity of social life and evolving through the interaction of its various areas, has been identified as a feature of Schmoller's argumentation that contributed most decisively to Schumpeter's perspective on socio-cultural evolution, with its analytical emphasis on the economy as a whole (Shionoya 1997: 242). Indeed, Schumpeter plainly stated that his theory of economic development should provide insights on the matter of institutional change that had been subject to Schmoller's notion of socio-cultural development cycles (Schumpeter 1926b: 49n). Schumpeter then nested his theory of economic development in the broader framework of a "philosophy of history" which should denote the principles and mechanisms of socio-cultural development, as outlined in the seventh chapter of the first edition of the "*Theorie der wirtschaftlichen Entwicklung*" (Schumpeter 1912: 545n). In this chapter, Schumpeter concluded the exposition of his theory by formulating a long-run perspective on the mechanism of development in general, suggesting with reference to Schmoller's notion of development cycles that the development path of nations and civilisations followed a cyclical pattern; a perspective that was to be discussed separately from the theoretical outline of the business cycle approach (Schumpeter 1912: 492).
In particular, Schumpeter pointed at the transforming logic of modern capitalism, in which evolutionary change would be causally related with the rise and decline of individual and collective economic agents, actually based on a cyclical mechanism of social mobility by competitive selection that fuels an economic and social process of declassing business enterprises and individuals (Schumpeter 1926a: 369). The corresponding "secular" cycles of socio-cultural evolution were not to be grasped simply in economic terms. As the cultural development of a people or a nation would be based on the interdependence that is already established between its various institutional and structural components, ranging from economy and polity to the arts, so the impression of a unified tendency in that development pattern persists. This implies that the process of economic development would receive major impulses from non-economic factors (Schumpeter 1912: 545n). Accordingly, socio-cultural cycles may influence the stimulation of new economic activities, yet they could also contribute to their slowing down in certain nations. Accentuating the institutional aspects of national

specificity then seemed to be an outstanding feature of the effects that would be exercised by these cycles of socio-cultural evolution (Schumpeter 1912: 492n).[62]
It remains to be noted that the seventh chapter of the first edition of the "*Theorie*" delineated the scope of Schumpeter's research program, pointing at the mechanisms of innovation and competition in various segments of socio-cultural development (Shionoya 1997: 32n).[63] Still, Schumpeter omitted the seventh chapter from the second edition of the "*Theorie*", presenting its essence only in the concluding sections. The reason for that omission seemed to lie in problems of exposition, for Schumpeter claimed that the "fragment of cultural sociology" presented in the chapter would divert attention from the key concern with dynamic theory (Schumpeter 1926: XI). However, Schumpeter reaffirmed decisive arguments from that omitted chapter in later publications, most notably in "Business Cycles" and "Capitalism, Socialism and Democracy", highlighting the institutional dimension of modern capitalism.
Despite that sustained impact of Schmollerian ideas on Schumpeter's research efforts in the domain of historical and institutional analyses, Schumpeter did not share the developmental optimism of the Schmollerian perspective, for his perception of economic progress in terms of expanding production and consumption possibilities ran parallel with a pessimistic belief in the cultural decline of modern capitalism, echoing an institutional tendency of socialist transformation. However, also in this case Schumpeter acknowledged certain parallels of his own position with Schmoller's, as he pointed out that Schmoller also highlighted that tendency without favouring the socialist ideal (Schumpeter 1926b: 7). Concerning the developmental vision, however, Schmoller's belief in ethical progress seemed to be outdated. Indeed, Schumpeter's cultural pessimism reflected an intellectual atmosphere that was also shaping the post-Schmollerian generation of the German Historical School, that is Weber, Sombart and Spiethoff, among others, who elaborated on an integrated historical and theoretical approach to the analysis of modern capitalism. In this context, the developmental dynamism of modern capitalism surfaced as an object of inquiry.

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[62] However, not only the scope of causation, but also the historical reach of these cycles was distinguished from the business cycles pattern discussed in the first edition of the "*Theorie*", that is essentially the Juglar cycle. The long cycle of the Kondratieff type excelled only in the subsequent discussions of business cycles as "historical individuals". It was of course not even debated when Schumpeter's "*Theorie*" was published in 1911, for the relevant publications of the pioneers of the long cycle approach, like Tugan-Baranovsky, Aftalion and van Gelderen, became available only since 1913 (Kleinknecht 1987: 3n). Still, it may be suggested that Schumpeter's discussion of the cycles of socio-cultural development, as presented in the seventh chapter of the first edition of the "*Theorie*", with its emphasis on institutional aspects, provided the foundations for the historical exposition of Kondratieff cycles in the "Business Cycles".

[63] Nonetheless, the claim has been made that Schumpeter's research program was subject to an epistemological break only after World War I, when the allegedly exclusive attention for neoclassical theorising seemed to shift towards the historist inspired framework of a comprehensive economic sociology (Kesting 1997: 196n).

4 THEORY AND HISTORY OF MODERN CAPITALISM

4.1 CAPITALISM AS AN OBJECT OF INQUIRY: FROM MARX TO WEBER

The struggle with the theoretical heritage of Marxian theory and its political implications characterised the intellectual efforts both of the Austrian School and the German Historical School since the end of the 19th century. Indeed, Menger, Böhm-Bawerk and Wieser, on the one hand, as well as Schmoller, Weber and Sombart, on the other hand, confronted the schemes of Marxian theory, highlighting its key concern with the development mechanism of capitalist economies. Schumpeter soon became an active participant in these debates. Indeed, understanding the Schumpeterian position on the economic development of modern capitalism demands a reconsideration of Marxian theory, set in a common context with the Historical School.[64] Although Schmoller had rejected the notion of capitalism due its allegedly materialist connotations, it was suggested by Schumpeter that Schmoller had actually popularised the Marxian thesis that the economic success of capitalism would destroy its institutional and social foundations, while leaving the underlying causalities of that process unresolved (Schumpeter 1942: 42n). This concurred with Schumpeter's uncommon interpretation of the Marxian theory of capitalist decline: "To say that Marx, stripped of phrases, admits of interpretation in a conservative sense is only saying that he can be taken seriously" (Schumpeter 1942: 58). Therefore, assessing the future of capitalism was said to be part of a research perspective that characterised both Marx and the Historical School, as both strands of thought were credited with an awareness of the institutional mechanism of capitalist development (Schumpeter 1946a: 807).
However, Schumpeter portrayed both Marx and Schmoller as failures in "pure" economic theory, whereas Marxian "reasoned history" was hailed as a role model for transforming economic theory into historical analysis, quite in agreement with approaches of the German Historical School (Schumpeter 1942: 44).[65] Primarily, the evolutionary perspective of Marxian theory was viewed with some approval:

> "Marx's theory is evolutionary in a sense in which no other economic theory was: it tries to uncover the mechanism that, by its mere working and without the aid of external factors, turns a given state of society into another" (Schumpeter 1954: 391).

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[64] Shionoya has suggested that Schumpeter shared the Marxian vision of capitalist development; whereas, the Schmollerian influence was most intense regarding the practical method of historical research (Shionoya 1997: 193). This argument fails to account for the impact of Schmoller's approach to socio-cultural development. More convincingly in this respect, the claim has been put forward that Schumpeter's approach to modern capitalism was rooted both in Marxian theory and the milieu of the "Youngest" Historical School with its discussion of the capitalist civilisation (Swedberg 1989: 517).

[65] Schumpeter's proximity to Marxian ideas excluded the domain of economic theory, in which Walrasian and Austrian components clashed with the labour theory of value. This applied also vice versa. From a Marxist point of view, Hilferding remarked on Schumpeter's static theory in "*Wesen*": "So it is consequent when Schumpeter (...) in his endeavour of safeguarding marginal utility theory at last reduces economics to statics, whereas it needs to be dynamics, the theory of the laws of motion of capitalist society. With this the conflict with Marxism is formulated most satisfactorily and clear-cut (...)" (Hilferding 1910/1968: 126, translation by author). Implicitly, Schumpeter's theory of economic development thus responded to the postulate for dynamisation by delivering an alternative to the Marxian theory of accumulation.

In accordance with that, Schumpeter's assessment focused on the mechanism of change:

> "But the grand vision of an immanent evolution of the economic process – that, working *somehow* through accumulation, *somehow* destroys the economy as well as the society of competitive capitalism and *somehow* produces an untenable social situation that will *somehow* give birth to another type of social organization – remains after the most vigorous criticism has done its worst. It is this fact, and this fact alone, that constitutes Marx's claim to greatness as an economic analyst" (Schumpeter 1954: 441, emphasis added).

The most interesting passages of that citation are of course the references to the mechanism of economic evolution. It is this unexplained mechanism, the "*somehow*", that contains the matter of innovation and competition in which Schumpeter's theory gains relevance. The Marxian vision of capitalist development was immediately compatible with Schumpeterian positions: "The persisting revolutionising of production, the uninterrupted disturbance of all social conditions, everlasting uncertainty and agitation distinguishes the bourgeois epoch from all earlier ones" (Marx and Engels 1848/1959: 465, translation by author). This standpoint on the relationship between industry, science and technology, and the corresponding process of social disenchantment had been initially outlined in "*Die deutsche Ideologie*":

> "Large-scale industry universalised competition (...), established means of communication and the modern world market, subordinated trade to itself, transformed all capital into industrial capital, and thus produced the rapid circulation (development of the monetary system) and the centralisation of capital. (...) It destroyed as far as possible ideology, religion, morality, etc. and where it could not do this, made them into a palpable lie. (...) It made natural science subservient to capital and took from the division of labour the last resemblance of its natural character" (Marx and Engels 1845-46/1973: 60, translation by author).

Accordingly, technological change belongs to the fundamental components of Marxian theory, and Schumpeter highlighted the fact that the "*Manifest*" dealt with science and technology not as independent factors but as endogenously generated products of bourgeois culture (Schumpeter 1949b: 210). Indeed, technological innovation was presented not only as a driving force of capitalist economic development but also as a historically unique characteristic of that mode of production:

> "The bourgeoisie, during its rule of almost one hundred years, has created more massive and colossal productive forces than all preceding generations together. Subjection of nature's forces, machinery, application of chemistry to industry and agriculture, steam navigation, railways, electric telegraphs, cultivation of whole continents, canalisation of rivers, whole populations conjured out of the ground — what earlier century had even a presentiment that such productive forces would slumber in the lap of social labor?" (Marx and Engels 1848/1959: 467, translation by author).

In large industry, the productivity of labour becomes ever more dependent on the state of science and progress of technology, marking the application of science to production, as Marx concluded: "The development of science, especially of natural science, and all others with the latter, is itself in turn related to the development of material production" (Marx 1857-58/1983: 600, translation by author).[66]

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[66] Rosenberg has noted that Engels, in his "*Dialektik der Natur*", transformed that Marxian statement to the general thesis that the development of science has been determined by production ever since the beginning of modern science. However, this position seems to have been reiterated only with qualifications in the Marxian scheme of thought (Rosenberg 1976: 136n).

Evidently, Schumpeter's development theory also responded to that Marxian characterisation of capitalism. In the posthumously published third volume of "*Kapital*", Marx summed up the major components of the capitalist mode of production as follows: "1. Concentration of the means of production in few hands, whereby they cease to appear as the property of the immediate labourers and turn into social production capacities. (...) 2. Organisation of labour itself, as social labour: through co-operation, division of labour, and the combination of labour with the natural sciences. (...) 3. Creation of the world market" (Marx 1894/1964: 275n, translation by author). Components one and two, namely industrial concentration and the rationalisation of production, were received most affirmatively by Schumpeter, who would include them in his own conceptual repertoire, yet proposing strikingly different explanations by highlighting the matter of entrepreneurship instead of the Marxian approach to classes as collective agents of change.[67]

Indeed, Marx would not deal with entrepreneurship as a distinct economic function, and even the capitalist as a businessman represented only capital, personified as the industrial despot (Blaug 1986: 169). Rather, Marx portrayed the capitalist as the "indispensable functionary of capitalist production", whose function it is to "force the production of surplus value" (Marx 1879-80/1962: 359). This has been explained by a Marxian quest for materialistic "objective" explanations of entrepreneurship in economic development (Schefold 1986b/1997: 508).[68] Marxian objective value theory and the related system-oriented orientation thus corresponded with a rejection of individualist perspectives on the development process. Indeed, Marx explained in the preface to the first German edition of "*Kapital*": "I paint the capitalist and the landlord in no sense *couleur de rose*. But here individuals are dealt with only in so far as they are personifications of economic categories, embodiments of particular class-relations and class-interests" (Marx 1867/1962: 16, translation by author).

The Marxian characterisation of capitalism as a historically specific socio-economic entity had been originally developed in the corresponding scheme of development stages, as presented in the "*Manifest*", coping with capitalism as the latest development stage that would prepare the grounds for communism. Marx then defined capitalism by institutional aspects like private property of the means of production and wage labour, emerging as a mode of production since the 16th century, although some Mediterranean cities, primarily in Northern Italy, were said to have hosted early forms of capitalist production even since the 14th century (Marx 1867/1962: 743n). This perception of modern capitalism as a historically unique phenomenon supplanted the Schmollerian notion of the "machine age", and related concepts in the research agenda of the German Historical School, thus responding to a contemporary political and intellectual atmosphere in which Marxism served as an inspiration for sorting out objects of inquiry; to be taken seriously even if rebutted on theoretical grounds. Next to the matter of the institutional foundations of economic development, definitely involving the matter of entrepreneurship, then, methodological problems concerning an integration of theory and history were taken to the fore, preparing a conceptual framework that should reach beyond the established positions of Marx and Schmoller.

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[67] Schumpeter emphasised Marx's emphasis on the "creative" and "revolutionary" role of the business class in the presentation of the "*Manifest*" (Schumpeter 1949b: 210).

[68] Marx also opposed the idea that pioneering entrepreneurs would benefit from surplus profits: "The far greater cost of operating an establishment based on a new invention as compared to later establishments arising from its ruins, ex suis ossibus. This goes so far that pioneering entrepreneurs go bankrupt most of the time, and only those later ones flourish to whose hands fall buildings, machinery, etc. more cheaply" (Marx 1894/1964: 114).

Corresponding modifications of the Schmoller program were most prominently pursued by Max Weber, Werner Sombart and Arthur Spiethoff, labelled the "Youngest Historical School" by Schumpeter (Schumpeter 1954: 815). While Schmoller had been aiming at the formulation of universally valid theoretical "laws" by the means of detailed historical and empirical studies, the post-Schmollerian strategy postulated a more refined approach. It claimed the necessity of an integration of theory and history by stressing the historical specificity of economic theories. Consequently, basic features of Schmoller's agenda were rejected, especially the epistemological device of a cumulative inductive progress of scientific insights that could promote future deductive reasoning. Sombart, for instance, introduced his seminal work "*Der moderne Kapitalismus*", the first edition was published in 1902, with the statement that a "renaissance of theoretical interest" would deprive the contrast of history and theory of its meaning and importance (Sombart 1916a/1987: XIV).[69]

This attitude towards an integration of theory and history was applied to the genesis and development of modern capitalism as an epochal phenomenon. Earlier theories of development stages, including Schmoller's approach, had been marked by a developmental optimism which claimed a tendency of progressing material wealth and ethical standards. Still, they had already dissociated themselves from the rationalist optimism of "eudaemonistic enlightenment", as Schmoller would have it (Betz 1988: 414). The "Youngest" Historical School then eliminated the remaining beliefs in a combined material and ethical progress. Instead, it pointed at the individual "gestalt" of economic formations, recognising the historical specificity of pre-capitalist economic life (Schefold 1996a: 187n). Moreover, the bureaucratic degeneration of capitalism with its implications for the ethical domain was taken to the fore. This rejection of developmental optimism was also at odds with the Marxian theory of development stages, still Schumpeter underlined the complementary nature of Marxian and Weberian perspectives, at least regarding capitalist rationalisation and the corresponding disenchantment of socio-economic relations (Schumpeter 1942: 10n). This assessment underlines Weber's outstanding role in the research efforts of the "Youngest Historical School".

Weber approached the analysis of modern capitalism with an exploration of its institutional foundations. The study on the protestant ethic and the "spirit of capitalism" excelled within that venture, applied to modern capitalism as a historical individual, that is a complex of relations in historical reality which are to be subsumed categorically regarding their cultural meaning (Weber 1904-05/1920: 30). The capitalist spirit denotes the attitude of a rational conduct of life, a professionally rationalised mode of business operation (Weber 1904-05/1920: 54n). The roots of that attitude lie in the spirit of Christian asceticism, most visibly in Protestant professional asceticism (Weber 1904-05/1920: 202n). Hence the spirit of capitalism is well described by the rational and ethical control of the drive for acquisition, as in Calvinism, which propels the systematisation of acquisitive activities (Weber 1921/1972: 378).[70]

According to Weber, then, even economic life of ancient Rome exhibited features of capitalism, as defined by "pure economic content", which applies when objects of

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[69] Consequently, it has been suggested that Sombart's analytical aim was the design of a "theoretical historism" that should combine Schmollerian and Marxian perspectives in a new conceptual framework (Lenger 1997: 157).

[70] Related modes of economic behaviour were defined by the expectation of profit through the realisation of exchange opportunities, oriented at the capital account (Weber 1920: 4n). Thus, Weber claimed: "capitalism is identical with the striving for profit, in continuous and rational capitalist enterprise: for an always renewed profit: for 'profitability'" (Weber 1920: 4, translation by author).

property may be exchanged on markets by private agents to the end of acquisition (Weber 1909b/1924: 15). Still, modern occidental capitalism exhibits the historically unique institutional feature of free labour in rational-capitalist organisation, based on the separation of households and business enterprise as well as on the introduction of rational book-keeping as a condition of exact calculation (Weber 1920: 7n). Weber presented the role of entrepreneurship in related terms. Historically, so he argued, the emerging capitalist form of organisation was accompanied by routines of business conduct exhibiting tranquillity and leisureliness, as experienced in continental textile industries until the middle of the 19th century. The rationalisation of single business operations by pioneering individuals then led to a restructuring of the whole industry with competitive struggles fuelling the rise and decline of individuals and firms, as the latter would have to go out of business (Weber 1904: 51n). In this context, Weber acknowledged the crucial role of charismatic leadership for the introduction of novelty in established organisations. Unlike traditional and rational types of rule, charismatic rule should reach beyond established routines; neither in line with historical traditions, nor bound to rules.[71] Its temporary character is based on a legitimisation derived from an ascription of charisma to leaders (Weber 1921/1972: 141n). Still, the Weberian entrepreneur is not merely a risk-taking adventurer or explorer, for he represents the rational attitude of the modern professional.

Indeed, Weberian entrepreneurship represents those aspects of the protestant ethic which have contributed to the rationalisation of economic life. Weber's "new style entrepreneur" should exhibit a firm character, an industrious work ethic, an energetic attitude as well as ethical qualities which would help winning the trust of customers and employees, overcoming the resistance against innovation. The work performance of entrepreneurs was said to be only met by their non-utilitarian, almost ascetic attitude concerning pleasure and consumption, for their motivation was rooted in professional concern, also understood as a religious duty (Weber 1904: 53n). However, Weber did not proceed with a further elaboration on a specific theory of entrepreneurship. In particular, his notion of entrepreneurship even seems to resemble the "character mask" of the Marxian capitalist. [72] This is in agreement with an acknowledgement of the social shaping of technological change, as Weber claimed that historically given and historically variable social conditions, to be perceived as constellations of interest of a specific type, would promote the utilisation of technological inventions (Weber 1909a/1922: 425n). Moreover, technological change becomes an object of rational calculation. This process is fuelled by another specific element of occidental capitalism, namely the rational pattern of law and administration that allows for establishing a premium system for the technological application of scientific insights. Therefore, Weber suggested that safeguarding the appropriability of innovation rents by the legal system has decisively contributed to the evolutionary dynamism of modern capitalism (Weber 1920: 10n).

Rational conduct of business thus corresponds to the rationalisation of other spheres of economic life. Weber introduced the notion of an ongoing bureaucratisation of socio-cultural life, maintaining that capitalist rationalisation would lead to the establishment of an "iron cage of serfdom", that is an all-encompassing administrative system of

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[71] In this context, it has been pointed out that routine and tradition would reinforce each other, for Weber's sociology of religion held traditionalism as equivalent to habits derived from everyday routines with an attributed status of invariant norms of conduct (Hoselitz 1961: 85).

[72] Mommsen therefore claimed that Weber described capitalism in an almost Marxian mode of argumentation, namely as an irresistible social force coercing men to subject themselves seemingly voluntarily to its social conditions (Mommsen 1974: 55).

bureaucratic rule in which individuals were reduced to mere objects of administration.[73] This would be paralleled by industrial trustification and the expansion of bureaucracy even within the private business sector (Weber 1918/1924: 506n). Still, entrepreneurship would continue to have an impact on economic organisations that are shaped by bureaucratic rule, based on special knowledge for administrating mass organisations. Indeed, Weber claimed that the only type of economic agent that was superior to bureaucracy in commanding that knowledge, at least regarding the own domain of activity, was the capitalist entrepreneur. Entrepreneurial knowledge of private agents interested in acquisition then allowed for immunity from the drive for bureaucratic rule (Weber 1921/1972: 129). The corresponding supremacy of entrepreneurial knowledge in economic affairs was basically derived from the uncertain position of entrepreneurs, always facing the possibility of economic extermination in competitive markets due to a failure in knowledge-based decisions (Weber 1921/1972: 574). Hence, Weberian entrepreneurship applied the matter of charismatic leadership both to political organisations and bureaucratic enterprises, pointing to a persisting pattern of organisational evolution.

These arguments lend support to interpretations of Max Weber as heir of the German Historical School, favouring a multi-causal approach to socio-cultural phenomena which embraces individual actions and social structures (Ringer 1997: 152). Yet further discussions on Weber's works have evolved around the corresponding theory of the evolution of modern capitalism.[74] Schluchter, for example, has portrayed Weber's research program as an exploration of universal history embracing evolutionary aspects and focussing on occidental social history with the analysis of modern capitalism as a starting point (Schluchter 1979: 12n). Hennis, however, dissents with labelling Weber an analyst of rationalisation, referring instead to Weber's perception of economics as a "science of man" which accounts for the complexity of human behaviour, paying reference to a tradition that reaches back to Roscher, Knies, and Schmoller (Hennis 1987: 38n). In this sense, Shionoya's notion of the "Schmoller-Weber-Schumpeter nexus" may be associated with common efforts in exploring the institutional dimensions of economic development in modern capitalism. Still, this "nexus" would provide more convincing evidence if it included Sombart and Spiethoff as outstanding post-Schmollerian contributors to these efforts.[75]

4.2 SOMBART'S APPROACH TO MODERN CAPITALISM

Sombart may be introduced as a representative of post-Schmollerian thought who responded to the Marxian challenge by confronting its essential topic, the evolution of modern capitalism, by the means of a renewed theoretical interest in the analysis of

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[73] The basic direction of that argument draws on earlier theses put forward by the German sociologist Tönnies, who differentiated "community" and "society", with the former as a vital organism containing elements like language and custom; and the latter as a mechanical aggregate that denotes elements like trade and science (Tönnies 1887/1922: 4n). The development of modern society implies that personal and informal components of community are increasingly replaced by impersonal and formal regulations (Tönnies 1887/18922: 51n). Orientation then shifts from status, a personal feature, to the law as a most abstract and general regulation of social affairs (Tönnies 1887/1922: 192).

[74] In this context, Weber's comprehensive relationship with the Historical School has indeed emerged as a growing concern, affecting classical sociological theory and economic sociology alike (Ebner 2001e: 1752n).

[75] In Shionoya's monograph "Schumpeter and the Social Sciences", Sombart is not even mentioned in the list of references (Shionoya 1997: 347n).

historical phenomena. Sombart's approach to economic development reflected Schmoller's concern with historical studies, while continuously acknowledging the complementing achievements of the Marxian perspective (Backhaus 1989: 78). Indeed, Sombart introduced the third volume of his "*Kapitalismus*" with the claim of a continuation and even completion of the Marxian works (Sombart 1927/1987: XIX). Despite an intellectual flirt with Marxism, Sombart's methodological orientation evolved continuously towards a hermeneutical orientation. Indeed, especially in Sombart's late works the earlier influence of Marxian ideas seemed to be reduced merely to an intellectual inspiration, still adding to the multi-faceted research program (Ebner 2002a: 7n).

According to Sombart, then, the task of the analyst should focus on the identification of connected systems of facts and events, forming wholes that constitute the subject matter of history; with reference to Dilthey also to be defined as "culture systems" (Sombart 1929: 2). This attempt has been labelled as "economic *gestalt* theory", striving for an interpretative understanding of the essence of economic formations, hence contributing to a hermeneutical modification of the Schmollerian research program (Betz 1993/1994: 332n). Paralleling Weber's "interpretative sociology", Sombart labelled his approach as a "*verstehende Nationalökonomie*", that is, an "interpretative political economy" set in a tradition of thought that should range from Vico to Dilthey (Sombart 1930a: 140n, 156n).[76] From this point of view, Schmoller's approach was criticised for its empiricist leanings, seemingly concentrating exclusively on the conceptual organisation of the empirical material (Sombart 1930a: 152n). Contributions like Schumpeter's "*Wesen*", however, rooted in static theories of neoclassical marginalism, were accordingly rejected for attempts to analyse economic phenomena by applying schemes of thought borrowed from the natural sciences, hence misconceiving the institutional substance of economic processes (Sombart 1930: 119n). In contrast to these procedures, Sombart aimed at the identification of meaningful patterns and tendencies that were conditioned by their historical context.

To serve that cause, Sombart presented the notion of "economic systems" as an attempt to conceptualise the essential historical forms and institutional features of economic processes by a systematic taxonomy (Sombart 1916a/1987: 14n). This orientation emerged from a criticism of Schmoller's notion of the national economy, *Volkswirtschaft*, which seemed to have failed as a device for identifying and relating the essential features of an economic formation in its historical context (Sombart 1929: 9n). Sombart's economic systems were defined as follows:

> "By an economic system is understood a mode of satisfying and making provisions for material wants which can be comprehended as a unit and wherein each constituent element of the economic process displays some given characteristics. These constituent elements are the economic spirit or outlook – the sum total of the purposes, motives and principles which determine men's behaviour in economic life – the form of economic life or the objective system of regulations of economic relations, and the technology employed in the system" (Sombart 1930b: 196).

[76] This approach should be distinguished from a "judging" strand of thought that would provide a reduced normative perspective on economic life due to its underlying beliefs, exemplified by the religious underpinnings of physiocracy (Sombart 1930a: 84n). Moreover, it should differ from "classifying" approaches such as classical political economy, as the primacy of quantification and formal abstraction was denied. According to Sombart, the latter could uncover regular patterns in the material of inquiry, but it would not allow for grasping its essential meaning (Sombart 1930a: 118n).

The concept of economic systems should cover three dimensions: "(I)t is the mode of providing for material wants, regarded as a unit which is (1) animated by a definite spirit, (2) regulated and organized according to a definite plan, and (3) applying a definite technical knowledge" (Sombart 1929: 14). In other words, economic systems should consist of an "economic spirit" representing dominant economic attitudes, principles and norms; an "economic order"' denoting institutional regulations as well as typical socio-economic relations; and "technology" as a specific mode of accumulating and using technological knowledge. Instead of pinpointing universal laws of development it was suggested that the historical meaning of an economic formation may be grasped by understanding its apparently objective "economic spirit" of hegemonic value-systems that would shape the behaviour of economic agents. The notion of economic systems then resembled a holistic "*Gestaltidee*" (Sombart 1930: 184n).

Dealing with these dimensions of spirit, order and technology as an interconnected whole, Sombart introduced a comprehensive list of possibilities that should cover the potential types of realisation (Sombart 1929: 15):

A. Spirit (Economic outlook):
   (1) The principle of satisfying natural wants – The money-making principle.
   (2) Traditionalism – Rationalism.
   (3) Solidarity – Individualism.
B. Form (Regulation and organisation):
   (1) Restriction – Freedom.
   (2) Private enterprise – Public ownership of the means of production.
   (3) Democracy – Aristocracy.
   (4) Compactness – Looseness.
   (5) Production for use – Production for the market (*Verkehrswirtschaft*).
   (6) Individual concerns – Socialized concerns.
C. Technical methods:
   (1) Empirical – Scientific.
   (2) Stationary – Evolutionary.
   (3) Organic – Non-organic (mechanical, inorganic).

In general, economic systems may be classified according to the types of "economic democracy" and "economic aristocracy", reflecting internal structures of hierarchy and power. Historically, they exhibit an "evolutionary tendency" of alternation, as the democratic system of handicraft was succeeded by the aristocratic system of capitalism which in turn seemed to be succeeded by another democratic form. However, the succession of these types involves phases of overlapping system components. The evolution of economic system is thus divided into early, high, and late developmental stages, in which only the middle stage allows for a pure realisation of the essential features of the economic system under consideration (Sombart 1929: 15n).

Sombart applied this scheme to his major object of inquiry, namely the genesis and evolution of modern capitalism in Western Europe. It is this choice of topic, and the focus on the institutional dimension for further inquiry, that expresses the proximity to Weber's works, elaborating on modern capitalism and its "spirit", by doing so even stimulating Weber's related efforts.[77] The late Sombart himself suggested that his own works contributed decisively to the recognition of capitalism as a fundamental feature in economic thought, although he acknowledged Marx's preceding exposition of the

[77] It is indeed noteworthy that Weber's work on the protestant ethic and the spirit of capitalism responded to the highly controversial first edition of Sombart's "*Kapitalismus*" which was criticised by Weber, among others, for a lack of analytical precision.

phenomenon (Sombart 1930b: 195).[78] Following Marxian theory, the introduction of capitalism as a specific economic system pointed principally to private property of the means of production (Sombart 1898/1906: 4). A complementing definition of capitalism was briefly stated as follows: "capitalism designates an economic system significantly characterised by the predominance of 'capital'" (Sombart 1930b: 196).[79]
In accordance with the scheme of economic systems, capitalism should represent a coherent configuration of economic institutions, organisations, and technologies, as pointed out in a more comprehensive definition:

> "By capitalism we understand a specific economic system which may be characterised as follows: It is a market economy type of organisation, in which regularly two different population groups: the owners of the means of production, who simultaneously obtain leadership, are economic subjects and those without possessions who are only labourers (as economic objects) are connected via the market, operating together; and which is dominated by the principle of acquisition and by economic rationalism" (Sombart 1916a/1987: 819, translation by author).

A specific feature of Sombart's approach to modern capitalism is the demarcation between pre-capitalist systems and capitalism, sorting out their essential characteristics. From this perspective, pre-capitalist systems are based on principles of a self-sufficient subsistence economy in which natural requirements and patterns of demand are satisfied according to a logic of status-oriented appropriateness, embedded in customary institutions. Money is perceived as a medium of exchange, a means to achieve the end of satisfying routine demand for goods and services. In sharp contrast, capitalism is based on principles of acquisition according to a logic of profit-maximisation and capital accumulation, perceiving money as a categorical end in itself. It is used as means to achieve the end of accumulating ever more money capital, based on credit and interest, and promoted by rational calculation, including methods of accounting (Sombart 1902: 378n).[80]
Consequently, Sombart rejected the notion of "economic man" as an universally valid economic character that has been prominent with the positions of classical political economy (Sombart 1913/1988: 13).[81] Sombart's underlying anthropological assumption claims that there exists no instinctive drive for acquisition, as "natural man" is bound to the traditional routine of self-sufficiency (Sombart 1927/1987: 426). Accordingly, the economic system of modern capitalism would be based on a spirit of money-making, rationalism, and individualism; with a form based on the looseness of individual

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[78] Mercantilism, though, was appreciated as a pioneering intellectual effort in the elaboration of policy-oriented contributions to the genesis and early development of capitalism (Sombart 1916b/1987: 937n).
[79] Sombart's definition of capital signified an accounting definition of exchange value serving as the basis of the working of capitalist enterprise (Sombart 1927/1987: 129n). As Parsons pointed out, this did not imply a reduced view on capitalism such as in Böhm-Bawerk's notion of the capitalist roundaboutness of production, for Sombart, like Weber, would stick to a broader cultural context (Parsons 1928: 642).
[80] It has been argued that this type of reasoning resembles the Aristotelian distinction of an "art of housekeeping" and an "art of enrichment", while it also seems to mirror the Marxian distinction of use value and exchange value (Prisching 1996: 306).
[81] Perhaps the most influential example of that position within classical political economy has been provided in the context of Adam Smith's discussion of the origins of the division of labour which is derived from "a propensity in human nature", that is "the propensity to truck, barter, and exchange one thing for another" which is even perceived as a means of communicative interaction, that is, as a "necessary consequence of the faculties of reason and speech" (Smith 1776/1976: 25). Still, it has been argued that the notion of "economic man", Sombart referred to, reaches well beyond that position, especially regarding the matter of unlimited acquisition which is neither part of Smith's ideas, nor of a broader classical perspective (Schefold 1986a: 210n).

freedom and concerns, shaping aristocratically organised private enterprises which produce for the market; including a technological profile of scientific methods that drive technological evolution. This is in accordance with the classification of credit and technological innovation as functional counterparts in the economic process, both revolutionising established structures in the formation of modern capitalism (Sombart 1927/1987: 219n).

Although these components should not express a hierarchy of causality, the dimension of economic spirit could be sorted out as a characteristic and driving force of capitalist evolution; it gained in analytical weight with Sombart's further research efforts. Consequently, Schmoller had criticised the first edition of Sombart's "*Kapitalismus*" for an allegedly Marxian materialism, whereas subsequent works were met with more sympathy, due to the more explicit reconsideration of economic behaviour and its motivational underpinnings (Betz 1993/1994: 345n). According to Sombart, then, economic spirit denoted the domain of motivation driving economic action, that is "all the expressions of the intellect, all the characteristics that become apparent in the course of economic activities", accompanied by "all ambitions, all value judgements, all principles" that shape the behaviour of economic agents (Sombart 1913/1988: 12). Derived from that definition, Sombart described the capitalist spirit in general terms as the "Faustian spirit: the spirit of unrest, of restlessness", for it would contribute to the decomposition of established routines, values and organic communities in favour of "self-interest" and "self-determination" (Sombart 1916a/1987: 327). Indeed, the capitalist economic spirit should reflect the ideas of acquisition, competition and rationality. Acquisition in terms of money represents the purpose of economic activity, accompanied by an attitude of competition. It becomes boundless as the goals of economic activity are infinitely removed and means become ends in a quest for economic progress, based on reduced cost structures and increasing productivity as sources of capitalist economic development (Sombart 1930b: 196n).

The motive of unlimited acquisition propels a process of rationalisation in which economic rationality emerges as the appropriate expression of economic behaviour. Even cultural dimensions are affected, for utilitarian valuation becomes hegemonic. The effects on the economic process point at both organisational and technological features:

> "Rationalization permeates, of course, the entire scope of business and affects its technical as well as its commercial aspects. It introduces into the sphere of production the most 'rational' methods and stimulates thereby the development of scientific technology. It creates rational factory management and leads to proper departmentalization and departmental coordination" (Sombart 1930b: 198).[82]

Nonetheless, capitalism as a whole remains an irrational system, for rationality conflicts with unlimited acquisition even on the level of individual action. Excelling spheres of contradiction that persist during capitalist development are the matter of irrationality versus rationality; the spirit of speculation versus calculation, and the mentality of the daring entrepreneur versus the hard working bourgeois (Sombart 1930b: 207). They contribute to the crisis-ridden instability of the capitalist economic process, including its disastrous impact on the natural and social environment (Sombart 1930b: 198). Sombart then claimed that the ambiguous structure of the capitalist spirit was also reflected by its two constitutive components: an entrepreneurial spirit based on a drive for unlimited

[82] The acceleration of time, both in subjective and objective terms, supplies a related topic in the discussion of the cultural impact of modern capitalism (Sombart 1927/1987: 23n). Marx had already introduced it, and Weber related it to Benjamin Franklin's motto "time is money" as an expression of the capitalist spirit (Weber 1904-05/1920: 31).

acquisition, conquering and the will for power on the one hand, and a bourgeois spirit of rational order, careful calculation and exact accounting on the other hand (Sombart 1916a/1987: 329n). It may be argued that these arguments transposed the Marxian motive of the "anarchy of commodity production" to the institutional sphere of contradictions in the capitalist spirit. In particular, though, this kind of ambiguity resembled the normative implications of the Schmollerian assessment of entrepreneurship, not to mention Veblenian ideas on that matter.

Sombart's notion of the capitalist economic order, that is basically its institutionally embedded organisational structure, pinpointed contract-based exchange relations that were established on markets. This economic order is characterised by an aristocratic pattern that reflects the minority position of the truly active and likewise powerful economic agents which are distinguished from the controlled masses. Economic freedom, that is, individualism and independence as further characteristics of the capitalist order, refers exclusively to these economic agents, also denoted as entrepreneurs. This constellation reflects the distinction between employers and employees. The minority of economic agents derives its advantageous position from the higher standard of technological knowledge and organisational skills it commands, well above the average of capabilities that sufficed in the pre-capitalist handicraft system to secure a position as an independent economic agent. Moreover, the division of labour in capitalist economies follows a rationale of direction and separation that ignores individual articulation (Sombart 1930b: 198n). Still, this division of labour allows also for a variety of organisational forms in the sphere of production. Therefore, the dominance of large-scale enterprises is persistently accompanied by production activities of small enterprises (Sombart 1930b: 199).

The technology of capitalism is shaped by a drive for achieving higher productivity through continuous improvement and perfection. Regarding its foundations in modern science, the interdependence of theory and practice is paralleled by the relationship of scientific discovery and technological invention (Sombart 1927/1987: 78n). Sombart concluded:

> "The scientific, mechanistic technology, which is based on the accomplishments of natural science and breaks through the limitations of an organic environment, meets the tests both of productivity and of perfectibility. In addition, the ideas underlying this technology are in precise correspondence with the spirit of the capitalist system. Thus the rationalistic spirit which permeates this technology merely testifies to the fact that economic principles of capitalistic organization have been applied to its technical process" (Sombart 1930b: 200).

With the advent of full capitalism, its scientific foundations approach an "anorganic-exact" type of science, characterised by a mechanistic world view. It implies an extended codification and formalisation of knowledge, which becomes ever more objective and codified at the expense of its subjective and tacit components (Sombart 1927/1987: 80n). The sustained expansion of inventive activity is explained by the latter aspect of objective knowledge, accompanied by its systematisation and mathematical formalisation (Sombart 1927/1987: 84n).[83]

Moreover, the capitalist system promotes inventions and their commercial realisation, as the carrying out of innovations belongs to its indispensable characteristics, quite in accordance with the underlying economic rationale:

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[83] Therefore, technology is perceived as a cultural feature of economic systems, that is, its development is shaped by the cultural evolution of an economic system, as exemplified by the emergence of modern rational technology in the context of a comprehensive process of Weberian "disenchantment" (Krabbe 1996b: 59n).

> "Completely in contrast to other economic systems, f.e. handicraft, which is according to its inmost nature hostile towards innovation and therefore towards inventors, for it finds every technical change an unwelcome nuisance, capitalism is addicted to innovations, be it in order to eliminate competitors by their assistance, be it in order to become active at all on their basis (new foundations!), be it – above all – in order to satisfy its inmost desire by using new (more profitable) methods: to make surplus profits" (Sombart 1927/1987: 87, translation by author).

Invention is promoted through the establishment of research departments in firms and public research and training institutes (Sombart 1927/1987: 87n). Technological change then becomes an endogenous element of the economic process, subject to economic calculation and administrative mechanisation, as the profit motive guides the entrepreneurial selection of promising inventions for further use as commercial innovation (Sombart 1927/1987: 95n).[84] Consequently, in Sombart's approach, the evolutionary character of economic development is related with the impact of entrepreneurship in its diverse historically conditioned institutional forms.

4.3 AN OUTLINE OF SOMBARTIAN ENTREPRENEURSHIP

The evolutionary aspect of Sombart's development theory is reflected by the conceptual moulding of spirit, order and technology, as components of the historically specific configuration of economic systems, according to particular developmental phases in terms of organic growth. Accordingly, Sombart claimed that his position would disclose "the nature of economic development which proceeds always in the shape of a gradual, 'organic' reorganisation of existing conditions", concluding: "New economy 'grows' like a plant, an animal" (Sombart 1927/1987: 1009n). This gradualist point of view was translated into the historically-oriented thesis, that modern capitalism in Western Europe had experienced an early phase of expansion, followed by a phase of dynamic full capitalism, and then experienced a late phase of bureaucratisation (Sombart 1930b: 206n). Early capitalism lasted from the 13th to the 18th century, when activities and relations of entrepreneurial economic agents and subordinate personnel were both still marked by the pre-capitalist handicraft system which had dominated Western Europe in the middle-ages, characterised by a type of harmony that was, according to Sombart, typical for organic life (Sombart 1916a/1987: 39). The evolution of modern capitalism then contributed to a gradual corrosion of the embeddedness of economic life in customary social relations.[85]

The epoch of full capitalism, lasting from the 18th century to the outbreak of World War I, should represent the ideal typical scheme of the capitalist economic system in its purest form, as it put the principles of profit and rationalism in control of economic relationships. In particular since the end of the 19th century, economic life became uniform, mechanised, and rationalised. The process of industrial concentration in

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[84] Regarding the ecological dynamism of technological change, the use of new materials, substituting for natural resources, implies a shift in natural resource constraints, as seemingly natural boundaries of the economic process are dissolved.

[85] Among the various factors, Sombart presented in order to explain the economic rationale of the rise of the capitalist economic system, the supply-side has been discussed with regard to institutional changes in the domain of motivation and attitude, related with the emergence of capitalist entrepreneurs and enterprises, while the changing structure of the demand-side has been singled out with reference to differentiated and refined luxury consumption and large-scale public demand of the state (Hagemann and Landesmann 1996: 199n).

manufacturing and services coincided with the emergence of Taylorist "scientific management", the productive application of engineering as a technological science, and the extended establishment of in-house laboratories, especially in the chemical industry. All of this mirrored the dominance of a spirit of efficiency in economic affairs (Sombart 1927/1987: 884n).[86] Finally, late capitalism, rising during World War I, should mark the corrosion of the capitalist spirit, accompanied by an extension of market regulations as an impediment to economic freedom and flexibility (Sombart 1930b: 206n). In this sense, Sombart's late capitalism was also denoted as a kind of "bureaucratised capitalism" (Sombart 1927/1987: 806).

Entrepreneurship was perceived as a most decisive factor in this process of capitalist development. Basically, Sombart's approach to entrepreneurship paralleled the Weberian emphasis on charisma and formal rationality, although it provided a more comprehensive approach that seemed to synthesise contemporary discussions, highlighting diverse entrepreneurial characteristics.[87] According to Sombart, the emergence of a capitalist spirit corresponded to the development of entrepreneurship, for pre-capitalist economic life was a routine process with an emphasis on custom and community, while capitalism set free novelty and individualism driving modern capitalism, as will for power and unlimited acquisition were brought together. Still, the spirit of enterprise and novelty could be traced both in economic and non-economic domains. In the sphere of government it would appear as an attitude of conquering and domination, in science as an attitude of demystification, in religion as an attitude of liberation, and in technology as an attitude of discovery (Sombart 1916a/1987: 328). Yet in economic terms it was introduced as a force of economic development that needed to be understood primarily in the context of capitalist enterprise. Hence, Sombart suggested: "The 'cell' of the capitalist economic system is capitalist enterprise. All life springs from it, because in it the driving force of the capitalist economy becomes active: the capitalist entrepreneur" (Sombart 1909: 698, translation by author). Despite the gradualist character of the evolution of economic systems, viewed from a historical point of view, the mechanism of the emergence of modern capitalism was not based on processes of cumulative causation, but rather on the intervention of entrepreneurial economic agents:

> "Capitalism has been brought about by individual, outstanding men, there can be no doubt about it. Any assumption of a 'collectivist', vegetative mode of generation, so to speak, is mistaken. No man knows who founded the village community or the guilds. They have really grown, emerging 'organically'. All and none and everybody have taken part in their creation. Capitalism is different, born in this world in the form of 'enterprises': that is in the form of rational, calculated, visionary creations of human mind. In the beginning there was the 'creative act' of the individual; a 'daring', 'entrepreneurial' man, who decided

[86] Sombart's related notion of the "objectification" of the capitalist spirit should describe both the depersonalisation of the economic process and the development of large organisations. These changes in the personal essence of the capitalist spirit proceeded in two stages, as reconstructed by Parsons. First, bourgeois components tame the entrepreneurial aspects, as rational organisation would begin to dominate energetic enterprise. Next, even the dominant bourgeois components would become part of an objective structure of means and ends that rule modern organisations, established as impersonal relations (Parsons 1928: 648n).

[87] It has been claimed that Sombart was the first German economist who understood the crucial role of entrepreneurship and its meaning as a force of development, in this case inspired neither by Marx nor Schmoller, but by contemporary hermeneutical ideas, as well as by sociological positions on the meaning of economic action that had been put forward by Weber (Redlich 1964: 87).

> courageously to step out of the tracks of routine business conduct and to follow new ways instead" (Sombart 1916a/1987: 836, translation by author).

This is in accordance with the argument that entrepreneurial positions would resemble aristocratic organisation, based on personality as opposed to collectivist community. The difference would lie in the matter of innovation as the breaking of customary routine: "The capitalist entrepreneur breaks with tradition by setting new goals for his economy. Consciously, he bursts through the barriers of the old mode of economic conduct, he is destroyer and builder together" (Sombart 1916a/1987: 837, translation by author).

Sombart thus associated the entrepreneurial function with the material implementation of imagination, including calculation and planning as well as the mobilisation of co-operative partners and the rejection of resistance. While entrepreneurs would be forced to act within an ends-means framework of striving for profit and rationalisation, they were attributed with a position to "fill that dead scheme with lively spirit" (Sombart 1909: 717). Related motives pointed to a concern for successful business performance in combination with the dissemination of novelty (Sombart 1909: 703n). In this context, Sombart distinguished between invention as the mere creation of a new idea or artefact and the applying dissemination of that invention, that is the actual innovation. Inventions are not pulled by the demand side of users and consumers, for it is the entrepreneur who decides according to his expectations which invention is realised as an innovation. Thus the entrepreneur forces the commercial outcome of certain inventions on the public (Sombart 1927/1987: 95n). Accordingly, Sombart claimed that technological improvement was decisive for eliminating market competitors by offering superior goods at lower prices, thus generating a differential profit that would serve as a dynamising factor in capitalist development (Sombart 1930b: 199n).

Underlying motives of entrepreneurs contain an array of impulses like "acquisitive drives", "desire for power", "craving for acclaim", "impulse to serve the common good", "urge for action". Yet entrepreneurs need to concentrate on the realisation of profits, due to the establishment of the acquisitive profit principle as an objective manifestation of capitalism that has evolved from subjective entrepreneurial motives. Hence it appears, as Marx put it, that capital itself exhibits a drive for profit (Sombart 1930b: 200). In full capitalism, entrepreneurial motivation becomes devoid of religious motives and customary bonds beyond bourgeois morals; it is secularised in the same way as the capitalist spirit has been secularised (Sombart 1927/1987: 30n). Accordingly, capitalist enterprise serves as the "locus of economic rationality", increasingly independent of the owner or staff of the establishment (Sombart 1930b: 200).

The matter of motivation corresponds to the diverse entrepreneurial types presented by Sombart. He described the entrepreneur as an economic agent who would be concerned with the uncompromising realisation of imagined tasks and duties, as illustrated by the example of adventurous explorers. This notion of the entrepreneur was styled with reference to characteristic types of man: the inventor of technological and economic-organisational modes of production, transport and sales; the discoverer of new areas for sales and distribution; the conqueror who fights down any resistance he meets; the organiser who is capable of organising a business venture by combining people and material most effectively. Moreover, the type of the trader was presented, alertly concerned with business ventures and profit opportunities, acting most successfully on competitive markets by means of calculation and bargaining (Sombart 1909: 728n).[88]

[88] It has been argued that this position would mirror a double character of Sombart's entrepreneur, constituted by two contrasting types of agents that are driven by specific psychological and institutional

The basic model of Sombartian entrepreneurship, however, was the independent owner-capitalist who steered an enterprise that had been established with his own financial means (Prisching 1996: 302n). However, Sombart stressed the historically conditioned character of entrepreneurship. In early capitalism, the entrepreneurial role of foreigners, that is basically migrants, as outsiders beyond local traditions and conventions was most important, as exemplified by the case of religious minorities. Moreover, in order to promote the introduction of novelty in an established economic setting, an entrepreneurial function of the state was envisioned, for instance regarding French Colbertism, with its support of model establishments in manufacturing (Sombart 1916a/1987: 847n).[89] In full capitalism, then, the dissociation of ownership and executive management was accompanied by the functional specialisation of entrepreneurs, reflected by the types of the expert, the merchant and the financier. According to Sombart, this process would drive a democratisation of entrepreneurship in terms of its social substance (Sombart 1930b: 203n).

Sombart's suggestion that the content of the entrepreneurial function should be distinguished according to business activity and organisational structure, supplemented by a historical differentiation of entrepreneurship with regard to the developmental phases of capitalism, was illustrated by the emergence of trusts (Sombart 1909: 721n). Parallel processes of "*Entseelung*" and "*Vergeistung*" would promote a degeneration of instinctive types of conduct, based on personal relationships, in favour of a rationalisation of human affairs. This advance of abstract and generalised rules and routines represents an inherent component of the capitalist spirit, to be traced in the systems of administration and accounting as well as in technological systems of production. This is accompanied by organisational structures that follow requirements of efficiency, often in accordance with principles of Taylorist "scientific management", accompanied by an organisational differentiation that involves technological innovation as an administrative topic (Sombart 1927/1987: 900n).[90]

However, in spite of rationalisation and the dominance of impersonal relations in bureaucratic organisations, the importance of the personal element in capitalist economies would remain important, although "the prime mover" in the economic process had become "the automatic, highly efficient contrivance unrestricted spatially or temporally". In that "mechanized world", outstanding individual personality would matter even more than ever, for the gigantic mechanised apparatus of modern organisations, like corporations, governments or armies, needed leaders who could deal with that mechanism and provide it with guidance. Thus, modern organisation would contribute to a centralisation and concentration of personal power (Sombart 1930b: 205). In the corporation, dominant shareholders could promote the cause of entrepreneurship, simply on the ground that "being an entrepreneur means ruling in the domain of the capitalist economy", which applies also to the large organisation (Sombart 1927/1987: 737n). Yet the original entrepreneurial spirit of full capitalism was said to be subject to a changing orientation: "All the differentia of a genuinely entrepreneurial spirit – daring decision, intuitive judgement, instinctive grasp of a

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motivations, namely the adventurous-heroic as well as the rationalist-professional types (Prisching 1996: 304n).

[89] A more precise formulation pointed at the entrepreneurial activity of government officials and bureaucrats as entrepreneurs, prevalent in the epoch of mercantilism, due to the common motive of accumulation and acquisition with manufacturing as a means to that end, and bureaucratic organisation as its necessary condition (Sombart 1913/1988: 90n).

[90] This argument underlines Sombart's perception of rationalisation as a process that transforms the institutional and organisational structures of capitalist enterprise, including the entrepreneurial role in the carrying out of innovation (Chaloupek 1995: 135n).

situation – become less and less important in the conduct of business" (Sombart 1930b: 207). The shifting character of entrepreneurship, dispersed in the administrative mechanism of the large organisation, then signalled a steady decline of capitalism and its economic spirit, even accompanied by a decomposition of the bourgeoisie as an intellectual or material force, and paralleled by an increasing economic impact of rentiers, also in this case underlining the historical specificity of capitalism (Sombart 1913/1988: 60n).

Accordingly, the contours of the economic process mirror the specific dynamism that shapes all the periods of capitalist development. Business cycle patterns become most significant in full capitalism, exhibiting the unique feature of expansion cycles that lead to upswings and downswings of economic activity according to a scheme of prosperity and depression (Sombart 1927/1987: 563n). The causation of these cycles is rooted in entrepreneurial motivation, framed by a likewise acquisitive attitude of lenders, basically banks, which is based on expectations concerning market entry and technological restructuring (Sombart 1927/1987: 568n). Depression is due to a widening disproportion between organic and non-organic sectors, essentially due to overproduction in the domain of heavy industry (Sombart 1927/1987: 578n). Furthermore, it triggers technological innovation in an atmosphere of competitive selection due to the elimination of unfit enterprises. Resulting from the rationalisation of production structures, thus, both upswings and downswings could benefit the capitalist system as a whole (Sombart 1927/1987: 584n).[91] However, even business cycle fluctuations of prosperity and depression seem to wither away, as the stabilisation of business conditions and economic processes proceeds quite in contrast to the Marxian prediction of a steady intensification of structural crises (Sombart 1927/1987: 701n).

Regarding the future of economic life in Western Europe and the United States, that is the "historical individual" which formed the object of Sombart's approach, the emergence of an overlapping structure of various historically persisting economic systems was announced. Capitalism would remain an important factor, although accompanied by components of cooperative economy, public economy, self-sufficient economy, subsistence economy, handicraft, as well as agrarian economy (Sombart 1927/1987: 1008n). However, capitalism would eventually lose its dominant position, as its institutional reserves exhaust with the bureaucratisation and mechanisation of economic life. Together with a stagnation of population growth, this could lead to a permanent stabilisation of the economic process. Furthermore, as planning elements would be strengthened, a stabilised type of capitalism would evolve, supposedly converging towards a rationalised type of socialism (Sombart 1927/1987: 1013n).[92] After all, Sombart's late contributions even claimed that economic life could be designed and reconstructed according to political will, bluntly denying the existence of economic laws and the impact of knowledge problems in regulation and planning, thus also challenging earlier arguments on the gradual evolution of economic systems (Sombart 1932: 1n). In this context, an increasingly sceptical attitude towards modern technology found its expression in romanticist arguments on the "taming" of capitalism by regulating its technological dynamism, accompanied by proposals for "reagrarisation", meant as a means to achieve full employment in the context of the

[91] It has been argued that this selective role of the economic downswing resembles a rather naive type of evolutionary thought, hailing the "selection of the fittest" (Hagemann and Landesmann 1996: 189).

[92] Hayek used to emphasise Sombart's intellectual influence in that particular case: "It is largely due to the influences of German socialist theoreticians, particularly Sombart, generalizing from the experience of their country, that the inevitable development of the competitive system into 'monopoly capitalism' became widely accepted" (Hayek 1944: 52).

"Great Depression" (Chaloupek 1995: 143). Thus Sombart's late concept of a post-capitalist economy with strong elements of administrative planning included the renovation of pre-capitalist components by political means (Prisching 1996: 327).[93] Still, quite in contrast to Weber's perception of the future of modern capitalism, this concept allowed for the persistence of institutional variety, and thus also for the variety of institutional forms in carrying out the functions of entrepreneurship. The constructivist implications of that position, however, contributed to alternative concerns with historical theories, and thus to the elaboration of the notion of economic style.

4.4 HISTORICAL THEORY AND ECONOMIC STYLES

Debates within the post-Schmollerian Historical School were persistently concerned with the historical specificity of economic phenomena and their explanations. This problem of historical specificity is based on an acknowledgement of the fact that different types of socio-economic system exist in historical time and geographical space. Historically specific theory then proposes that different socio-economic phenomena also require theories that are in some respects different (Hodgson 2001: 22n). In an outstanding contribution to post-Schmollerian discussions, Salin distinguished a historical-appreciative type of theory striving for complete insight into the subject matter as a whole, rooted in the Historical School, and a rational-dogmatic type of theory striving for partial insight, rooted in classical traditions. The relationship between these strands of theorising should be based on interdependence and mutual analytical assistance. The rational strand may grasp universal aspects of rational conduct that are common to all economic formations, and especially relevant in the economic system of capitalism, while its service to historical theory lies in the provision of heuristical devices (Salin 1927: 327n). The synthesis of theoretical and historical concerns that resulted from Salin's proposal stimulated further discussions on appropriate modes of transcending the epistemological shortcomings of the Schmollerian position.

Spiethoff followed that line of argumentation, yet with additional references to Schumpeter and Sombart, as he differentiated "pure theory", which may provide heuristic devices by applying methods of isolation and abstraction in order to address universal phenomena, and "economic gestalt theory", which should serve the analysis of historically conditioned economic life by recognising the interdependence of its components (Spiethoff 1932: 55n). In evaluation of that position, it has been claimed that the appreciation of pure theory as a nomothetic core, applicable to all historical formations, brings Spiethoff's approach in line with Schmoller's original intentions (Dopfer 1988: 560n). However, Spiethoff went on to distinguish three systems of economic knowledge. First, a "timeless", non-institutional and therefore non-historical theory, that is, a pure theory which abstracts from the historical specificity of economic life. Second, gathered under the heading of "historical theory", a "pure theory" with an isolating, ideal typical character and an "economic gestalt theory" with a real typical

[93] At this point, Sombart established himself as representative of an antimodernist attitude, reflecting the spirit of a "conservative revolution" in the 1920s. However, Sombart's flirt with National Socialism was only of a temporary nature, reflecting the ambiguity of a political orientation that had also witnessed an earlier connection with Social Democracy before World War I (vom Brocke 1987: 53n). This ambiguity was shared by many other outstanding economists with politically conservative leanings, including Pareto, Wieser, and of course even Schumpeter himself.

character, both dealing with historically specific objects of inquiry. Third, the analytical system of economic history (Spiethoff 1952: 134n).[94]

The core of Spiethoff's approach to historical theories was constituted by the notion of economic styles, which had emerged from earlier discussions within the German Historical School, reflecting a metaphorical orientation towards the cultural sciences, and thus expressing a pronounced distance towards the use of metaphors from evolutionary biology (Schefold 1994a: 221n). In contrast to Sombart's late works, Spiethoff consistently emphasised the role of empirical observations, since his economic styles were derived from Sombart's economic systems, yet striving for their perfection in terms of categorical flexibility and empirical applicability (Redlich 1970: 646). This should provide a response to a line of reasoning that had been put forward by Schumpeter, among others, who had felt uncomfortable with the adverse analytical impact of hermeneutical exaggerations (Schumpeter 1926b: 50). However, Spiethoff followed Sombart in presenting the notion of economic style as an ideal typical research tool apart from its Weberian meaning, arguing that it should cover both the rational and non-rational aspects of the historical material by grasping it in its totality (Spiethoff 1932: 58). In this sense, Spiethoff's notion of economic style resembled the comprehensiveness of Schmoller's "*Volkswirtschaft*". With additional references to List, Knies and Dilthey, an outline of the style notion was presented with regard to the mater of historical specificity:

> "Most economic phenomena are time-conditioned and are rooted in specific geographical areas. They are subject to change over time and cannot be treated, therefore, with the help of concepts and theorems purporting to be of universal applicability. Economic theory can deal with those phenomena only by differentiating patterns of economic life, patterns which have come into being in the course of the historical process. As a matter of fact, as many patterns must be delimited as there are essential and typical differences in the basic economic institutions. Patterns of this kind are here called economic styles. Every one of them demands its own economic theory, which, though being genuine theory, is applicable only for the domain of that style" (Spiethoff 1952: 132).

The historical character of economic theories would demand that they are viewed in the context of certain economic styles: "Under these circumstances economic theory is a 'historical' category to the extent to which its applicability depends on the existence and dominance of a certain economic style, elements of which are embodied in the theoretical structure" (Spiethoff 1952: 132). These economic styles reflect a coherent system of interdependent elements, which are rooted in specific institutional configurations. Spiethoff concluded: "The concept of economic style is the tool with the help of which uniformities in time are made available for theoretical research" (Spiethoff 1952: 137). It should contribute to the analysis of the historicity of economic wholes, combined with an explanation of the causal relationships that govern these entities. In particular, this concept should be used in three different ways. First, as a complex picture of both rational and irrational aspects of economic life, hence differing from Weber's ideal type. Second, as an ideal typical construction, not at all connected with empirical reality. Third, as an utopian vision of an economic style, resulting in the preparation of normative conclusions (Spiethoff 1932: 60n). As a demonstration of

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[94] In this context, Spiethoff argued that Schumpeter's business cycle theory represented pure theory, because its point of departure was based in an unreal state of affairs, namely an equilibrium state, disturbed by entrepreneurs. Spiethoff's own business cycle theory, as a historical theory, would take substantial components of a realistic state of affairs as its point of departure, proceeding with the analysis of essential features of the real process (Spiethoff 1948: 572n).

these ideas, Spiethoff compared Schumpeter's model of static and dynamic economies with different economic styles, contrasting the dynamism of industrial capitalism with the assumed static character of agrarian feudalism (Spiethoff 1932: 78).[95] In order to approach economic styles in more detail, then, a preliminary compilation of characteristics was presented (Spiethoff 1932: 76n, translation by author):

I. Economic spirit:
(1) Ethical attitude. The kingdom of God is aspired to; economic successes are aspired to as an indicator of divine selection; community concerns are taken as guideline; the most sublime worldly happiness of the individual is aspired to.
(2) Spiritual motivation of economic action. Fear of punishment, religious-ethical motives (altruism, sense of duty, instinct for ethical action), partly ethical motivation (sense of honour, drive for activity, joy of work), self-interested motivation (aspiring to personal economic advantage), impulse of personality, aspiration to power. An intention of self-sufficiency or acquisition is pursued, depending on the strength of motivation.
(3) Mental attitude. Habitual or innovating attitude, resulting in a diversity of technology.

II. Natural and technological foundations:
(4) Population density.
(5) Natural population dynamics. Static, slowly, moderately, rapidly growing.
(6) Production of goods with or without division of labour.
(7) Intellectual and manual work united or divided.
(8) Organic or anorganic-mechanic realisation of technology.

III. Constitution of society:
(9) Range of the economic sphere of society.
(10) Social cohesion. Kinship, force, contract.
(11) Social division of labour and social composition.

IV. Constitution of the economy:
(12) Proprietary constitution. For investment goods, with free property of consumption goods, either free or state or societal property. For consumption goods (and investment goods) societal property.
(13) Constitution of the production of goods. Self-sufficient economy: production of requirements under integrated management. Regulated market production: production of goods in economic units under regulation of production and price formation by societal organs consisting of entrepreneurs, workers, consumers (planned economy), or by political organs. Free market production: production of goods in economic units unrestricted according to market constellation.
(14) Distributive constitution. General compensation, regulated special compensation, free special compensation, altruism.
(15) Constitution of labour. Cooperative, forced or contractually sovereign. According to a combination of the possibilities in nos. 12 – 15 the whole economic constitution presents itself as: planned management, or regulated free constitution, or free constitution.

[95] Moreover, Spiethoff claimed that this illustration of circular flow and evolutionary change could contribute to the elaboration of a pure theory of economic styles (Spiethoff 1949: 291).

V. Economic process:
(16) Economic process. Continual economy, progressing economy, economic process in continuous alternation of upswing and stagnation.

Spiethoff claimed that this notion of economic styles, perceived as an expression of a historical approach to political economy in the Schmollerian tradition, would stand for a conceptual culmination of historism in general (Spiethoff 1938: 35). Indeed, the catalogue of style characteristics reflects the conceptual range of the German Historical School. The first topic of economic spirit points at historically variable types of motivation, ideology and belief-systems in shaping economic behaviour, as presented by Schmoller, Sombart and Weber, who explored the institutional dimension of economic development.[96] Next, natural and technological foundations of the economy as well as its social and economic constitution are mentioned as style elements. Both were crucial in post-Schmollerian theories of capitalist development. At this point, Spiethoff's handling of technology resembles Sombart's thesis that capitalism establishes an impersonal technological system within an extended division of labour. The accompanying criteria of the social and economic constitution include the distribution of property rights and diverse modes of allocation.[97] Finally, the contours of the economic process are presented as an endogenous element of economic styles, reflecting Spiethoff's contributions to business cycle theory. Business cycles were thus classified as phenomena with a specific capitalist character:

> "It must be clearly understood that business cycles are time-conditioned and belong to the capitalistic style within which they represent a specific and typical phenomenon. Should capitalism change its characteristics or entirely disappear, business cycles would change their characteristics or disappear also" (Spiethoff 1952: 139).

By emphasising the individual characteristics of economic styles, Spiethoff could underline that this approach was well designed for the comparison of economic formations with all their inherent varieties and recurring uniformities. Furthermore, Spiethoff's economic styles should encompass material and structural as well as institutional elements without establishing a hierarchy of priorities, hence countering both Marxian materialism as well as romanticist idealism. Correspondingly, Spiethoff persistently claimed that economic structures were not determined only by the principles of acting men, but largely by the prevailing natural, technological, and social conditions (Redlich 1970: 648). In that particular sense, Spiethoff's approach proved to be analytically superior to alternative notions of economic style that put the analytical emphasis on the component of economic spirit, then understood in terms of world-views and their religious underpinnings.

The theory of development stages had claimed progress in socio-cultural standards during the evolution of civilisations, whereas the economic style approach opposed that

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[96] In particular, the manner of grasping the institutional foundations of technological change deserves attention. Spiethoff's reference to dominant attitudes towards technological change within a range of habitual or innovating attitudes resembles theories of entrepreneurship in Sombartian as well as Schumpeterian terms, although Spiethoff did not deal with a specific theory of entrepreneurship in the context of his economic style approach.

[97] Although Sombart had accounted for these aspects too, an additional impact of Stammler's "socio-legal" approach with its focus on the legal order as a determinant of economic life may be noticed (Diehl 1941: 46n). In this context, Diehl pointed at Commons as the outstanding representative of socio-legal thought in the domain of US-American institutionalism (Diehl 1941: 100n). Commons, however, presented his approach to the legal foundations of capitalism, that is to the "rules of conduct governing transactions", rather with reference to "Volitional Theories" within classical political economy, as represented by Hume and Malthus (Commons 1924: 4n).

point of view in favour of a recognition of the historical specificity of economic formations. Indeed, this constellation of adverse positions dominated the post-Schmollerian discourse in the Historical School, promoting distinct views on the notion of economic style apart from Spiehoff's approach, quite in accordance with the underlying research venture. Bechtel, for instance, argued that the primary concern of the economic style perspective would lie in the intellectual and motivational disposition of economic agents, namely in their individual and collective modes of dealing with economic life, as materialised in artefacts of architecture and painting (Bechtel 1930: 14n).[98]

Similarly, Müller-Armack aimed at an analysis of the emergence of economic styles by means of the historical process itself, using religious world views as a criterion for their historical-geographical identification, as they would shape economic, political and technological positions, expressed as a "unity of expression and attitude" within a country or region (Müller-Armack 1940/1981: 57n). Müller-Armack argued that common features of European economies were historically rooted in a European economic style of the Middle Ages, then fragmented into national styles and regional "style zones" due to Reformation since the 16th century (Müller-Armack 1940/1981: 96n). In normative terms, then, the concept of the Social Market Economy was meant as a style of reconciliation in which principles of social subsidiarity would be amalgamated with market competition, based on shared cultural values (Müller-Armack 1952/1966: 234n).[99] Although the whole context of post-Schmollerian discussions mattered for that perspective, quite in accordance with Müller-Armack's interest in economic development and business cycles, Max Weber's works were explicitly singled out as a stimulating influence among the intellectual roots of this notion of economic style (Müller-Armack 1940/1981: 48n).

Spiethoff claimed that Bechtel had overemphasised the role of art as an indicator of a certain economic style, while he criticised Müller-Armack for his monistic interpretation with an exclusive focus on the causal role of religious ideas (Redlich 1970: 647n).[100] However, Spiethoff's own position was challenged by plan-market schemes that would come to dominate comparative economics; a terrain prepared by Mises's contributions to the socialist calculation debate. Eucken's approach provided an analytical cornerstone for these plan-market schemes, taking its point of departure in the dichotomy of theory and history, by doing so confronting the same array of problems the Historical School as well as Schumpeter had struggled with. Indeed, Eucken's notion of economic system was formulated as an explicit critique of the Historical School, that is in particular of Spiethoff's economic style approach (Eucken 1940/1944: 46n). Eucken suggested that historism focused on irrational elements in history, leading to a relativism that would fail to notice the universal character of rational figures in human reasoning (Eucken 1938: 73n). His ideal types of economic systems should be

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[98] In particular, Bechtel argued that the emergence of a new type of individualism in the late Middle Ages in Germany was mirrored by a related style in architecture and painting. The social underpinnings of that development, resembling Burckhardt's thesis on the advent of individualism in the culture of Italian Renaissance, were provided by a class of urban bourgeois merchants who promoted that new style of art (Bechtel 1930: 268n). In this sense, Bechtel's argumentation also provided insights on the material aspects of cultural change (Schefold 1994a: 225n).

[99] This combination of social and ethical concerns resembles the Historical School. The related theories of Ordoliberalism that shaped German economic policies in the post-war era, related the dynamism of market processes with institutional pillars such as a religion-based community orientation and a strong state with a high level of policy competence (Rieter and Schmolz 1993: 87n).

[100] Müller-Armack's later practice of using a notion of "cultural style" was therefore praised by Spiethoff as a conceptual clarification (Redlich 1970: 651).

applicable to all economic epochs, highlighting centralised-administrative versus decentralised market-based modes of planning and allocating (Eucken 1940/1944: 95n).[101]
On a fundamental level of comparison, this debate reflected an epistemological confrontation of the phenomenological perspectives of historism with the mechanistic notions that had dominated neoclassical marginalism (Schefold 1996b: 313).[102] In Eucken's theory of economic systems, culture and the economy were no more endogenous factors of socio-cultural evolution, as the Historical School would have had it. Rather, culture was now perceived merely as a framework of the economic process, that is, as a separate data set beyond the grasp of economic analysis (Schefold 1995: 227n). The corresponding reduction of the analytical horizon is reflected by the aspect that Eucken's scheme of economic systems basically focussed its attention to the matter of economic constitution in Spiethoff's comprehensive catalogue of style components. Hence, decisive parts of the institutional substance of modern capitalism were discarded, even the specific category of "capitalism" was abandoned. Consequently, it may be argued, that the Schumpeterian position provided the most promising opportunities for a continued exploration of themes that were lost in other strands of thought evolving from the German Historical School.

4.5 SCHUMPETER AND THE GERMAN HISTORICAL SCHOOL: A SUMMARISING OUTLOOK

The institutional and historical segments of Schumpeter's research program tried to solve questions that had been put forward by various generations of the Historical School, and even the solutions he prepared would have been unthinkable without a reconsideration of the "*Schmollerprogramm*", paralleled by an underlying strand of argumentation that was inspired by Marxian theory. Schumpeter shared this combination of Schmollerian and Marxian thought with the Youngest Historical School and its concern with the institutional foundations of modern capitalism. Regarding Marxian theory, this implied a revision of Marxian positions apart from an ontological and epistemological core of dialectical methodology, materialist philosophy and the labour theory of value. It is not accidental that Weber, Sombart and Schumpeter at times were labelled as prototypes of a "bourgeois Marx", accounting for the Marxian vision of the economic process while rejecting fundamentals of Marxian theory.[103]
Max Weber's theorising, to begin with, had a well-documented impact on Schumpeter's concept of economic sociology, while the thesis of bureaucratic rationalisation endowed

[101] Also in contrast to the style perspective, Eucken's position allowed for political construction, as deliberate choices on the institutional foundations of an economic system would determine its further evolution (Schefold 1995: 226n).
[102] Georgescu-Roegen characterised Eucken's approach as a "chemical doctrine of the economic process", based on combinations of universal components of an economy, to be contrasted with a perception of holistic aspects of an economic system, resembling Gestalt philosophy (Georgescu-Roegen 1971: 326n). Implicitly, this amounts to an argument in favour of the economic style approach. Nonetheless, it has been also proposed that Eucken's arguments provided at least a convincing criticism of historist relativism (Dopfer 1992: 298n).
[103] Moreover, it is not accidental that all of them were temporarily related with the revisionist wing of Social Democracy. Both Weber and Sombart were engaged in extensive debates with the latter, yet keeping an intellectual as well as organisational distance, whereas Schumpeter even joined politics for a brief period after World War I, participating in the German Commission on Socialisation, then joining a socialist-led Austrian government. However, again, it may be emphasised that all of them upheld their conservative ideals during these debates and affiliations.

it with motives that were also inspired by Marxian thought. Indeed, Schumpeter was not only willing to grant economic sociology an exclusive position in the domain of economic analysis, but as he also contributed to contemporary sociological discussions, especially with his theories of social classes and imperialism. In most of these efforts, Max Weber's theorising served as a stimulating reference (Swedberg 1989: 508n). Yet it seems that there is more evidence to be noticed concerning the impact of Weberian thought on Schumpeter's theorising than vice versa, underlining Schumpeter's intellectual debt to Weber (Osterhammel 1987b: 107).

A persisting intellectual struggle with Marxian ideas characterised also the research agendas of Sombart and Schumpeter. The latter even portrayed Sombart as a "descendant of Marx and the Historical School" (Schumpeter 1927c: 349).[104] Those problems of integrating theory and history that were related with the "Youngest" German Historical School were discussed by Schumpeter ever since "*Wesen*". There he suggested that historical theory, as represented by Sombart's theory of modern capitalism, needed to be distinguished from economic history as well as from pure theory, for it would be derived directly from the historical material. He concluded on the analytical character of historical theories: "So they are anything but 'static', wherein lies a decisive difference with our essentially static theory. Perhaps the area of 'dynamics' is all theirs. This will have to substantiate" (Schumpeter 1908: 18, translation by author). Schumpeter added that economic history and the corresponding descriptive approach would continue to dominate the area of economic dynamics due to a current lack of exact methods, with "German" contributions accounting for the most meaningful insights (Schumpeter 1908: 617).

In particular, Schumpeter remarked in the second German edition of his "*Theorie*" on the impact of Sombart's elaboration on modern capitalism:

> "Such an exposition, (...) – it is not merely a historical theory and a theoretical, that is a factual elements causally linking, history of capitalism, yet in approach and implementation even both for the pre-capitalistic economy of historical time –, is the highest objective ambition can achieve today" (Schumpeter 1926a: 90n, translation by author).

These issues were treated as specific subjects of a theory of development, corresponding with the analytical tasks of economic sociologists and economists facing the historical process (Schumpeter 1926a: 91). In this context, Schumpeter even spoke of the "service" his own theory should provide for the historical approach to economic development, an approach that was said to be most effectively represented by Sombart (Schumpeter 1926a: 92n). In the authorised English translation of 1934, which had been modified and abridged, the reference to Sombart was removed, although the general content on the differentiation between pure and historical theories remained valid (Schumpeter 934: 59).[105] Schumpeter then claimed that he was not aiming at the

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[104] In Schumpeter's "Capitalism, Socialism and Democracy", evidence for like-minded research interests surfaced most clearly, as part five of the book dealt with a comparative historical exposition of socialist parties (Schumpeter 1942: 303n). This effort resembled publications of the young Sombart, when he presented a comparative history of socialist ideas and the labour movement with its diverse national characteristics (Sombart 1896/1908: 159n).

[105] The corresponding passage in Opies's translation of the "*Theorie*" proceeds as follows: "Such an exposition as Sombart's is theory, and indeed theory of economic development in the sense in which we intend it for the moment. But it is not economic theory in the sense in which the contents of the first chapter of this book are economic theory, which is what has been understood by 'economic theory' since Ricardo's day. Economic theory in the latter sense, it is true, plays a part in a theory like Sombart's, but a wholly subordinate one: namely, where the connection of historical facts is complicated enough to necessitate methods of interpretation which go beyond the analytical powers of the man in the street, the

construction of a related approach, for there should be no indication of historical factors. Indeed, the explicit aim of Schumpeter's theorising should be constituted by an improvement of the economic theory of the circular flow, although he conceded: "If this were also to enable this theory to perform better than hitherto its service to the other kind of theory of development, the fact would still remain that the two methods lie in different planes" (Schumpeter 1934: 61).

Surfacing ambiguity in these assessments may reflect shifts towards hermeneutical ideas, at last coming to dominate Sombart's late works. The Historical School met critical acclaim especially after Schumpeter had moved to the University of Bonn in 1925, as Schumpeter put forward an affirmative assessment of Schmollerian ideas in economic sociology (Schumpeter 1926b: 1n). Also the third volume of Sombart's work on modern capitalism was well received, although it was already said to suffer from theoretical rigour. For instance, Schumpeter asserted that Sombart had failed in analysing the entrepreneurial function in terms of economic causality, thus misrepresenting its role in competition and economic evolution, although the characterisation of the entrepreneurial type would have provided quite promising material for doing so (Schumpeter 1927c: 362n). Regarding a symbiosis of theory and history, in this case applied to industrial organisation, Schumpeter even postulated the necessity of elaborating on a combination of Sombart and Edgeworth (Schumpeter 1927c: 366). An explicitly more negative attitude concerning Sombart crystallised after Schumpeter went to Harvard in 1932, possibly echoing Sombart's increasingly hermeneutical orientation. According to Schumpeter, then, Sombart even seemed to have "out-Schmollered Schmoller" (Schumpeter 1954: 874n).[106] However, this kind of critical distance was not confined to Schumpeter's comments on Sombart. Problems of subjective introspection and a lack of intersubjective communication in the process of hermeneutical understanding were also acknowledged by Salin, and they had been criticised in other cases by Max Weber (Schefold 1994a: 218n).

In contrast to that, Schumpeter's assessment of Spiethoff, a colleague at the University of Bonn as well as a personal friend of Schumpeter's, remained consistently affirmative. They shared positions on the role of institutional analysis as well as a distinguished interest in business cycle research (Swedberg 1991: 69n). Schumpeter had portrayed Sombart as a promoter of Juglar's attempts to establish a perspective on the business cycle beyond crisis theory, then claiming that the analytical content of Spiethoff's work had contributed more convincingly to the propagation and modification of Juglar's ideas (Schumpeter 1927a: 269). Similarly, he claimed that Spiethoff's notion of "*Wechsellagen*" pictured important cyclical phenomena, although the notion of "*Wechselspannen*", pointing to the long cycles identified by Kondratieff, would highlight the extended contours of economic development which had been ignored by Sombart (Schumpeter 1927c: 361n). Schumpeter even suggested that, "with the possible exception of Marx, Spiethoff was the first to recognize explicitly that cycles are not merely a non-essential concomitant of capitalist evolution but that they are the essential form of capitalist life", although he would not subscribe to the notion of long cycles as a

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line of thought takes the form offered by the analytical apparatus. However, where it is simply a question of making development or the historical outline of it intelligible, of working out the elements which characterise a situation or determine an issue, economic theory in the traditional sense contributes next to nothing" (Schumpeter 1934: 59).

[106] Apart from Sombart's hermeneutical reorientation, it may be additionally argued that all too affirmative references to Sombart's work did not fit in with the intellectual milieu at Harvard University in the 1930s, where the English edition of the "*Theorie*" was published.

specific outcome of extended periods of prosperity and depression (Schumpeter 1954: 1127).

Spiethoff's business cycle theory linked the cyclical upswing with capital goods and equipment as part of a causal structure that contained capital investment in new enterprises as well as demand-side impulses on input factor markets, whereas the downswing resulted from overproduction in the capital goods sector.[107] Moreover, Spiethoff's theory, designed as an application of his historically-concrete "gestalt" approach, proposed that cyclical economic activities are conditioned by the historical context, that is, by the economic style of modern capitalism, with capital investment as the driving force of the economic process (Spiethoff 1955: 14). In particular, he claimed that the economic style of full capitalism would contribute to the cyclical contours of the economic process by a certain economic spirit, the expansion of capitalist production based on a revolutionising kind of technological change beyond organic growth, and the free constitution of the market with its features of a monetary economy (Spiethoff 1948: 628).

This reference underlines Schumpeter's characterisation of Spiethoff as a major contributor to economic sociology in the Schmollerian tradition, set in relation with post-Schmollerian attempts of integrating theory and history (Schumpeter 1926a: 377). Although Schumpeter rejected the idea of an objective meaning of historical formations, he portrayed the economic style approach from a cautiously affirmative perspective, pointing at the analysis of economic motives which were said to be of utmost importance for a sociological theory of economic styles, but not for static economic theory (Schumpeter 1926a: 132).[108] Unfortunately, in the English edition of the "*Theorie*" all references to Spiethoff's original term "*Wirtschaftsstil*" were translated inadequately as "type" (Schumpeter 1934: 71). The more appropriate term "economic style" would have reflected the actual metaphorical orientation toward the cultural sciences, as well as the intellectual context of Schumpeter's related ideas.[109]

It is in accordance with this interpretation of economic styles that Schumpeter claimed with regard to the domain of economic growth that theory should be bound to "serve" historical research by structuring the various factors of growth (Schumpeter 1947b: 6). In this sense, the option for a comparative multi-factor approach to economic growth and development was presented:

> "(E)conomic growth is not autonomous, being dependent upon factors outside of itself, and since these factors are many, no one-factor theory can ever be satisfactory. That is to say, such theories as that economic growth is a function,

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[107] Schumpeter rejected Spiethoff's concept of overproduction, replacing it with his own theory in which clusters of innovation drive the development process. Nonetheless, he appreciated Spiethoff's theory of business cycles as an indispensable influence on his own theorising, supplemented by Lederer's approach (Schumpeter 1926a: 320n). Indeed, it has been proposed, that at least Spiethoff's explanation of the upswing, apart from resounding Tugan-Baranovsky's thesis of industrial disproportion, parallels Schumpeterian concepts of industrial restructuring (Hagemann 1999: 98n).

[108] This applied also vice versa. Indeed, Spiethoff would subsume Schumpeter under the same category of pure theory that should cover Keynes, the neoclassicals as well as classical political economy, contrasting with empirical-realistic theory that described efforts of the Historical School reaching back to the mercantilists (Spiethoff 1955: 12).

[109] Still, Stolper has asserted that Spiethoff's approach to economic styles was "static in proposing to construct (...) any number of possible economic systems by combining twenty variables in all possible ways"; whereas, "Schumpeter could not have been more different" (Stolper 1988: 16). This argumentation remains unconvincing, because, in contrast to Sombart's concept, Spiethoff's catalogue of style components was explicitly meant as a preliminary illustration. Actually, Spiethoff himself formulated a similar criticism of Sombart, postulating that the criteria of an economic style needed to be open to further extensions (Spiethoff 1948: 577n).

> chiefly, of the objective opportunities of the environment, of increase in population, of the 'spirit' of a nation's civilization, of technological progress (increasing 'control over nature') can never be adequate" (Schumpeter 1947b: 4n)

As a result, Schumpeter's approach to economic development should allow for the specific "gestalt" of objects under examination. It may be noteworthy to register that this perspective has been influenced by ideas of Gestalt psychology, for Schumpeter claimed that these would contribute to a non-metaphysical concept of society, based on the proposition that "individual elements of any set of elements are not perceived or appraised individually but as part of the definite set in which they occur" (Schumpeter 1954: 798). A corresponding note on Spann's universalism provides further insights on that topic:

> "If universalists were content to preach a "holist" meta-economic or philosophical interpretation of both economic reality and economic theory, there would be no objection; in fact I should actually sympathize with their meta-economics, though I might interpret it to myself in terms of *Gestalt* psychology" (Schumpeter 1954: 413, emphasis in original).

It becomes obvious once more that Schumpeter's views went far beyond the narrow range of methodological individualism. Indeed, it has been argued that the Schumpeterian credo allows for a perception of individual actions as embedded in social relations which are open to change, while individual phenomena may be viewed in the context of an institutional "gestalt" configuration. This corresponds with Spiethoff's economic gestalt theory.[110]

However, Schumpeter claimed that none of the economic systems or economic styles in the sense elaborated by the Youngest Historical school would represent an essential unity, as phrases like "pure capitalism" might suggest. Accordingly, he disapproved of the identification of a specific "spirit" of modern capitalism as its internal driving force. Schmoller was even mobilised against related attempts, ascribed to Weber and Sombart, of tracing the origins of modern capitalism to the institutional features of certain historical periods: "Schmoller's work comes much nearer to displaying the true spirit of historical research and presents a much better grasp of its scope and use in economics" (Schumpeter 1939: 229n). Economic styles should rather reflect a pattern of diverse elements, that is of overlapping style elements, while changes of economic style should be analysed by means of the competing down of economic agents, their related organisations, and the elimination of institutional forms. According to Schumpeter, a generalisation of this mechanism of change could promote the establishment of a general theory of development (Schumpeter 1926b: 49n). These arguments on competitive change in economic styles point to the institutional dimension of modern capitalism, treated as a core aspect in Schumpeter's theory of economic development which reflects the impact of the German Historical School.

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[110] It should be emphasised that the term "economic gestalt theory" had been introduced by Fritz Redlich, whose work at the Harvard Research Center for Entrepreneurial History provides another telling example for the close relationship between the Schmollerian research agenda and Schumpeterian themes (Redlich 1964: 13n). He translated Spiethoff's article on the historical validity of economic theories with explicit reference to phenomenology and Gestalt psychology (Spiethoff 1952: 135, Translator's Note by Redlich). The term in question, "*anschauliché Theorie*", has also been translated more recently as "historical-concrete theory", providing a direct translation of the German term (Gioia 1997: 172n). This may serve as an appropriate complement.

5 SCHUMPETER'S CAPITALISM: AN INSTITUTIONAL ANALYSIS

5.1 THE INSTITUTIONAL DYNAMISM OF CAPITALIST DEVELOPMENT

Schumpeter's approach to the analysis of modern capitalism was based on a punctualist evolutionary perception of economic development, based on the carrying out of innovations, thus contrasting with a cumulative and organic notion of economic growth. In terms of distinct economic styles, then, the evolutionary character of economic development matches the development process in modern capitalism. In "Capitalism, Socialism and Democracy", Schumpeter summarised these views on the relationship between evolution, innovation and modern capitalism as follows:

> "The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process. (...) Capitalism, then, is by nature a form or method of economic change and not only never is but never can be stationary. And this evolutionary character of the capitalist process is not merely due to the fact that economic life goes on in a social and natural environment which changes and by its change alters the data of economic action; this fact is important and these changes (wars, revolutions and so on) often condition industrial change, but they are not its prime movers. Nor is this evolutionary character due to a quasi-automatic increase in population and capital or to the vagaries of monetary systems of which exactly the same method holds true. The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumer's goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates" (Schumpeter 1942: 82n).

Consequently, capitalism, understood as "a method of economic change", is based on a competitive mechanism of internal restructuring: "(T)he same process of industrial mutations (...) that instantly revolutionizes the economic structure *from within*, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism" (Schumpeter 1942: 83). This standpoint implies that capitalism, as a historical manifestation of evolutionary change, is based on historically specific institutional forms that constitute its unique economic character. This institutional pattern should also include specific types of economic agents who carry out certain development functions.

Indeed, in Schumpeter's thought, the term "institutions" should stand for "all the patterns of behaviour into which individuals must fit under penalty of encountering organized resistance", including not only legal institutions such as property rights or contract regulations and the agencies engaged in their generation or enforcement, but also informal norms, conventions and customary types of behaviour (Schumpeter 1950/1991: 438). Resounding Schmollerian ideas, institutions thus enable as well as constrain the economic process. The corresponding notion of order should denote the institutional body of an economy, hence contributing decisively to the characterisation of an economic system and thus drawing attention to the pivotal role of institutions in Schumpeter's theorising on capitalism (Schumpeter 1928b: 363).

Among the most pointed definitions of capitalism formulated by Schumpeter, then, the focus is on the monetary means of introducing novelty to the economic process:

> "The form of economic organisation in which the goods necessary for new production are withdrawn from their settled place in the circular flow by the intervention of purchasing power created *ad hoc* is the capitalist economy, while those forms of economy in which this happens through any kind of power of command or through agreement of all concerned represent non-capitalistic production" (Schumpeter 1934: 116, emphasis in original).

This basic scheme of the capitalist economy is specified by a definition of capitalism in institutional terms: "capitalism is that form of private property economy in which innovations are carried out by means of borrowed money, which in general, though not by logical necessity, implies credit creation" (Schumpeter 1939: 223). Schumpeter proposed that the aspect of "commanding" the means of production by monetary aspects of credit creation would contribute decisively to economic phenomena which were a specific feature of modern capitalist economies, contrasting with other "economic styles" (Schumpeter 1926a: 107).

Accordingly, the dating of capitalism should depend on the criterion of adequate historical records concerning the institutional mechanism of credit creation. Schumpeter claimed that this would allow for dating the advent of capitalism in Southern Europe at least since the 12th century (Schumpeter 1939: 224). The institutional foundations of capitalism were well established since the 15th century, including business firms, stock and commodity speculation as well as financial organisations, although capitalism as a dominant economic system evolved only since the 18th century in Western Europe. The novel content of that capitalist economic pattern has been derived from the relative importance of its components, all of which have been existing before their rise to institutional dominance (Schumpeter 1954: 78n). Schumpeter thus concluded with respect to the persistence of variety in the institutional order of capitalism, perceived as a condition of economic development:

> "There was no such thing as a New Spirit of Capitalism in the sense that people would have had to acquire a new way of thinking in order to be able to transform a feudal economic world into a wholly different capitalist one. So soon as we realize that pure Feudalism and pure Capitalism are equally unrealistic creations of our own mind, the problem of what it was that turned the one into the other vanishes completely. The society of the feudal ages contained all the germs of the society of the capitalist age. These germs developed by slow degrees, each step teaching its lesson and producing another increment of capitalist methods and of capitalist 'spirit'" (Schumpeter 1954: 80n).

Capitalism therefore evolved from the socio-cultural substance of preceding forms of economic organisation, based on institutional elements that were cumulatively growing in economic and social influence. Resembling the principle of historical continuity as a perspective on economic development, Schumpeter claimed: "(W)e nowhere meet a distinct and logically autonomous problem of the birth of capitalism or of any outburst of economic activity of a new type" (Schumpeter 1939: 228).

In particular, Sombart's focus on "economic spirit", introduced as a characteristic of economic systems, was criticised for neglecting institutional variety and other common properties that could mark the intrinsic qualities of these systems (Schumpeter 1928a: 477). Therefore Sombart's idea of the advent of a distinct capitalist spirit since the 15th century was dismissed, as was Weber's concept of a specific type of rationality, rooted in protestant ethics, as a formula denoting that capitalist spirit (Schumpeter 1939:

228n).[111] This argumentation included a critique of the Weberian transition from an ideal typical "Feudal Man" to a "Capitalist Man" which seemed to misrepresent the character of historical transition (Schumpeter 1954: 80). Again, Schmoller was mobilised against Sombart and Weber: "Those problems owe much to Schmoller, who must also be credited with having been one of the first students of economic history to realise fundamental identities under widely different cultural forms" (Schumpeter 1939: 228n).[112]

In general, any attempt of finding a primary institutional impulse for the development of modern capitalism seemed to be as ill-conceived as Marxian theorising on the mechanism of primitive accumulation which tended to trace the origin of the capitalism in the historical emergence of commodity production as a means to generate surplus value. According to Schumpeter, the corresponding arguments would mistakenly suggest that the basic characteristics of modern capitalism would reveal themselves as essential features already during its historical formation. In contrast to that, Schumpeter suggested that credit creation, as a constitutive institutional mechanism of modern capitalism, need not have played a major economic role during the 13th century while it would play this major role in contemporary capitalist processes of innovation and economic change (Schumpeter 1939: 230).

According to Schumpeter, then, the specific feature of rising capitalism would not lie in diffusing a spirit of economic acquisition and material greed, but in developing and sharpening the institutional aspects of rationality in two ways. First, money becomes a unit of account and thus serves the practice of cost calculation, illustrated by the advent of double-entry bookkeeping as emphasised by Sombart. This type of logic, as manifest in a "spirit of rationalist individualism", tends to dominate the institutional sphere of modern capitalism, also propelling the logic of enterprise. Second, the mental attitude of modern science as well as the means of exploiting that attitude are promoted by that specific type of rationality, hence scientific and technological progress systematically emerge as an endogenous factor in the capitalist economic process (Schumpeter 1942: 123n). Even cultural spheres are subjugated to that type of hegemonic rationality, which finally extends its reach to the cultural domains of art and life styles, based on a drive for quantification and rationalisation (Schumpeter 1942: 123n).

Consequently, the features as well as the impact of modern capitalism transcends the margins of the economic process: "Capitalism (...) means a scheme of values, an attitude toward life, a civilization – the civilization of inequality and of the family fortune" (Schumpeter 1949e/1975: 419). It is an outstanding argument in Schumpeter's perception of modern capitalism, that the institutional order of capitalism is supported by pre-capitalist institutional patterns and social strata which exhibit a dynamising function in the development process. However, while innovations repeatedly dissolve industrial structures in the successive "gales of creative destruction", a decomposition of these pre-capitalist institutional and social spheres is taking place, finally even affecting the domain of capitalist institutions, thus expressing a developmental tendency of capitalist decline (Schumpeter 1942: 131n). This is the meaning of Schumpeter's thesis,

[111] Schumpeter's critique of Sombart's approach also highlighted problems of historical precision. Even more recent assessments of Sombart's theorising have set aside the claim that the emergence of double-entry bookkeeping marked the advent of early capitalism and thus should be understood as its constitutive element. Actually, these ideas fail in passing the test of detailed historical examination (Schneider 1996: 42).

[112] Schmoller's comparative analysis of merchant guilds and modern cartels sufficed as an example of historically sensitive "sober realism" (Schumpeter 1939: 229).

put forward with reference to Schmoller, which maintains that the economic success of capitalism undermines its institutional foundations.
In particular, the fundamental "scheme of values" crumbles, as private property and family-orientation, both setting major incentives for economic activity in the private sector undergo an institutional depreciation. The system of property rights, characterised as an indispensable component in the institutional order of capitalism is hollowed-out. Small businesses and their owner-managers are driven out of the markets due to industrial concentration, while the status of private property and free contracting is undermined in a business environment of large enterprises with their characteristic separation of ownership and management. Moreover, the pre-capitalist institutional scheme of family values, which had supported the capitalist process on a motivational basis, is decomposed on a social scale (Schumpeter 1942: 140n). The conclusion followed rather provocatively:

> "In breaking down the pre-capitalist framework of society, capitalism thus broke not barriers that impeded its progress but also flying buttresses that prevented its collapse. That process, (...) was not merely a matter of removing institutional deadwood, but of removing partners of the institutional stratum, symbiosis with whom was an essential element of the capitalist schema. Having discovered this fact (...) we might well wonder whether it is quite correct to look upon capitalism as a social form sui generis or, in fact, as anything else but the latest stage of the decomposition of what we have called feudalism" (Schumpeter 1942: 139).

A Marxist argumentation would portray the decomposition of pre-capitalist institutions as a dynamising factor in capitalist development, freeing the productive forces from the bondage of custom and tradition. Sombart basically followed that argumentation, although with different normative implications that resembled the Schmollerian scepticism regarding modernity.[113] Although Schumpeter shared some normative concerns of this standpoint, still his analytical position contrasted with Marx and Sombart in claiming that pre-capitalist traditions contributed decisively to the mechanism of economic evolution in capitalist economies, providing institutional incentives as well as shaping modes of economic behaviour that would be conducive to the carrying out of innovation. Hence, the enabling function of institutions for technological change was underlined. The figure of the entrepreneur belongs to that segment of Schumpeterian argumentation, which proclaimed that "the capitalist order not only rests on props made of extra-capitalist material but also derives its energy from extra-capitalist patterns of behaviour which at the same time it is bound to destroy" (Schumpeter 1942: 162).
For that reason, Schumpeter's capitalism appeared as a symbiotic amalgamation of pre-capitalist, that is basically non-capitalist, and capitalist components. Its reproduction would depend on their co-existence. Upholding institutional and structural variety then constitutes a crucial condition for sustaining capitalist development. Indeed, Schumpeter's approach to the "crisis of the tax state" elaborated on that thesis of a necessarily impure economic system. In this case, the bourgeois tax state was analysed as a fiction which did not exist as a pure type, for it was penetrated by "elements of the past" and "shadows of the conditions of the future" (Schumpeter 1918/1953: 345). Hence, institutions like the legal system would evolve from a historical process in which they could gain a relatively autonomous dynamism, obtaining a role beyond mere

[113] Even in an institutionalist framework, as inspired by Veblen, the assumed dichotomy of institutions and technology would imply that institutional habits may impede the growth of instrumental knowledge and its application to technological change (Tool 1990: 170n).

representation of the underlying material interests of social groups who took part most actively in their evolution.[114] This was in agreement with Schumpeter's notion of "distorted capitalism":

> "(I)t is important to keep in mind that what we know from experience is not the working of capitalism as such, but of a distorted capitalism which is covered with the scars of past injuries inflicted on its organism. This is true not only of the way in which our business organism functions but also of its structure. The very fundaments of the industrial organisms of all nations have been politically shaped. Everywhere we find industries which would not exist at all but for protection, subsidies, and other political stimuli, and others which are overgrown or otherwise in an unhealthy state because of them" (Schumpeter 1939: 13).

Schumpeter underlined, however, that both private initiative and public management would prevail to some extent in all the actually existing systems, regardless of their situation in an epoch of "intact capitalism" or in the realm of "Soviet socialism". Hence, the orientation at exclusive categories like capitalism or socialism could be misleading, due to persistence of categorically impure variants. Therefore, the thesis of an essential institutional heterogeneity of actually existing economies and societies was applied to capitalism as well as to feudalism and other formations, implying that "every society contains, at any given time, elements that are the products of different social systems" (Schumpeter 1943: 114n).

The constitutive role of institutional variety was also prevalent in the way Schumpeter conceptualised differences in the institutional set-up of nation-states and national economies. On the topic of national institutional specificity he suggested in general terms:

> "(A)t any given time, every nation has a certain class structure and a certain civilization. The concept of civilization comprises a system of beliefs, a schema of values, an attitude to life, a state of the arts, and so on. This (...) will in general determine a nation's behaviour in its foreign and domestic affairs" (Schumpeter 1948/1991: 429).

While Schumpeter held sympathy for the idea of historically rooted national regularities in habits and thoughts, subsumed under the term "*Volksgeist*", which had been prominent in idealist strands of German political philosophy, he argued that these regularities would result from hegemonic social values set up by dominant groups and classes in a certain historical context, exhibiting a high degree of inertia (Schumpeter 1929a/1953: 214n). Schumpeter then concluded:

> "Social structures, types and attitudes are coins that do not readily melt. Once they are formed they persist, possibly for centuries, and since different structures and types display different degrees of this ability to survive, we almost always find that actual group and national behaviour more or less departs from what we should expect it to be if we tried to infer it from the dominant forms of the productive process" (Schumpeter 1942: 12).

Accordingly, national economies would differ in terms of their inherent variety of production modes, accompanied by an equivalent variety in social structuration and institutional constellations. As these are closely linked, Schumpeter underlined "that the spirit of a people or a time is never an architectural unity" (Schumpeter 1929a/1953: 214).

Consequently, whether viewed from a historical standpoint on capitalism as an economic style, or from a position that deals with specific national or even regional

[114] Schumpeter thus presented a concept of institutional inertia that was especially meant to contradict the Marxian approach to institutional analysis with its focus on class interests (de Vecchi 1995: 6n).

economies, Schumpeter's argument applies that sustained reproduction depends on the persisting variety of institutional and structural forms. It reflects a rejection of those theories that seem to perceive a uniform style of economic life in favour of an approach that acknowledges the historically evolving multi-layered scheme of style elements.[115] Accordingly, the capability for innovation, understood as the internal factor of capitalist development, is embedded in an institutional setting which is shaped by a historically conditioned degree of variety; to be interpreted in terms of an "embedded entrepreneurship" (Ebner 1999: 148n). According to Schumpeter, however, the institutional core of capitalist development is more specifically constituted by the interdependent development functions of entrepreneurship, invention and finance. Approaching these functions implies a reconsideration of the type of rationality that shapes their interaction, as the process of rationalisation is closely related to the monetary and scientific spheres of economic development.

5.2 DEVELOPMENT FUNCTIONS AND RATIONALISATION

The crucial role of institutional variety in Schumpeter's approach is mirrored by the distinction of specific functions that need to be put into effect in the development process by certain institutional carriers. The core relationship in that perspective is constituted by the endogenous functions of the entrepreneurial introduction and the capitalist financing of innovations, accompanied by the originally exogenous function of invention that is increasingly endogenised during the evolution of capitalism. A decisive factor in the set up of these institutional constellations is the specific type of rationality that shapes both the use of money as a unit of account and the advent of modern science, expressing a tendency for the rationalisation of all spheres of socio-cultural life. Therefore, the monetary and scientific spheres, which serve as rationalising pillars of capitalist civilisation, actually shape the articulation of finance and invention as distinct functions in economic development.

The typical mode of financing innovation proceeds by means of credit, provided by capitalists as a specific category of economic agent:

> "It is obvious that this is the characteristic method of the capitalist type of society – and important enough to serve as its *differentia specifica* – for forcing the economic system into new channels, for putting its means at the service of new ends, in contrast to the method of a non-exchange economy of the kind which simply consists in exercising the directing organ's power to command" (Schumpeter 1934: 69n).

Schumpeter thus proposed that the logical relationship between credit creation and innovation was fundamental for understanding the economic evolution of modern capitalism, with credit creation perceived as "the monetary complement of innovation" (Schumpeter 1939: 111). The monetary creation of credit then parallels the material creation of novelty in production, serving as the financial precondition of the latter, with capitalist bankers and entrepreneurial industrialists as types of economic agents who represent this relationship on an institutional level. In the original scheme of Schumpeter's theory, the entrepreneur carries out new combinations of the means of production by setting up a new firm. This venture is typically financed by means of credit, provided through capitalists who come to represent the calculating elements in

[115] With reference to the Weberian approach, thus, Schumpeter's insistence on a dynamising role of the variety of institutional and social patterns has been termed the postulate of "overlapping geists" (Macdonald 1965: 378).

that scheme, acting as rational risk-takers. The credit debt is settled by funds provided through the realisation of an entrepreneurial profit in the market process. Thus, the economic functions of entrepreneurship and finance are conceptually coupled with the matter of uncertainty and novelty.

Risk is closely associated with capitalist finance. However, it enters into the pattern of entrepreneurial activity only indirectly, acting as a barrier to the flow of credit for financing innovations, and thus contributing to the obstacles that need to be overcome by entrepreneurial intervention (Schumpeter 1939: 104). Indeed, Schumpeter portrayed the relationship of capitalists and entrepreneurs as contradictory, settled on grounds similar to the relationship between the entrepreneurial owner-managers of firms and the labourers they employ. These conflicts do not necessarily result from contradictory economic interests but rather from problems of leadership that are associated with the economic process (Schumpeter 1927b/1985: 171n).

Moreover, the motivational aspect of that relationship was pinpointed regarding the setting of full capitalism, with entrepreneurial owner-managers and bankers as concerned parties. The entrepreneurial agent was said to be driven by motivations that are shaped by non-capitalist values of family-consolidation or dynasty-building, utilising the acquisition of entrepreneurial profit as a means to achieve these ends which are essentially alien to the rationality underlying the capitalist value system. However, the motive of monetary accumulation as an end in itself characterises the economic attitude of capitalists who are portrayed as the rationally calculating type of economic agent. An associated line of reasoning focuses on the banker as the carrier of the capitalist function of finance:

> "The banker (..) is not so much primarily a middleman in the commodity 'purchasing power' as a *producer* of this commodity. However, since all reserve funds and savings to-day usually flow to him, and the total demand for free purchasing power, whether existing or to be created, concentrates on him, he has either replaced private capitalists or become their agent; he has himself become the capitalist par excellence. He stands between those who wish to form new combinations and the possessors of productive means. He is essentially a phenomenon of development, though only when no central authority directs the social process. He makes possible the carrying out of new combinations, authorises people, in the name of society as it were, to form them. He is the ephor of the exchange economy" (Schumpeter 1934: 74).

This reference to the "ephor", an elected magistrate in ancient Sparta who had to supervise the king, should underline the distinct role of capitalist rationality in the relationship of entrepreneur and banker: "Just like the entrepreneur is the king, so is the banker the ephor of the market" (Schumpeter 1912: 198, translation by author).

Accordingly, due to the proposition that "the banker's function is essentially a critical, checking, admonitory one", Schumpeter emphasised that the institutional independence enjoyed by the banking sector, as opposed to industry and government, was of utmost importance for the development process (Schumpeter 1939: 118). However, ongoing rationalisation and the evolution of capitalism towards a trustified and increasingly administered type of economy would be fuelled by a more intense intervention of banks in the industrial sector, leading to a situation in which banks have established themselves as "a social organ of entrepreneurial activity." Hence, due to that interference, the possibility of an intensified conflict of interests between entrepreneurs and bankers was acknowledged (Schumpeter 1949c/1951: 262).

Historically, borrowing and lending for industrial purposes arrived comparatively late during the evolution of modern capitalism, while pre-capitalist modes of lending often

supported non-economic purposes. Financial systems, in terms of modern credit systems, emerged usually in concert with the demand for financing the establishment of new enterprises and industries, as exemplified by the case of the major German banks (Schumpeter 1926a: 105n). Furthermore, also governments and organs of public finance have taken part in that process of innovation-related credit creation, although the part played by governments was largely biased towards consumptive expenditures. Thus it was relegated to a position of secondary analytical relevance in Schumpeter's theorising (Schumpeter 1939: 113n).

Schumpeter then suggested that the money market would belong to the indispensable institutional components of capitalist economic development, with a market structure characterised by high volatility, resulting from its function as a decisive terrain in the allocation of resources: "All plans and outlooks for the future affect it, all conditions of the national life, all political, economic, and natural events" (Schumpeter 1934: 126). Schumpeter then claimed:

> "The money market is always, as it were, the headquarters of the capitalist system, from which orders go out to its individual divisions, and that which is debated and decided there is always in essence the settlement of plans for further development. (...) Thus the main function of the money or capital market is trading in credit for the purpose of financing development. Development creates and nourishes this market" (Schumpeter 1934: 126n).

Consequently, set in relation with the role of entrepreneurs and capitalists in the development process, Schumpeter concluded on the money market: "It becomes the heart, although it never becomes the brain, of the capitalist organism" (Schumpeter 1939: 127).[116]

In order to emphasise the specific orientation of that argument, Schumpeter's characterisation of banking, finance and the capital market as rational domains of an economy may be contrasted with Keynes's more sceptical portrayal with its focus on market psychology. Differentiating between "speculation" as "forecasting the psychology of the market" and "enterprise" as "forecasting the prospective yields of assets", Keynes claimed that the emergence of organised investment markets could lead to a dominance of speculation over finance (Keynes 1936: 158n). He suggested that the speculative element would impede an efficient allocation of investment: "When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done" (Keynes 1936: 159). Still, this does not imply that Schumpeter only dealt with positive effects of financial markets for economic development, ignoring their destabilising impact in triggering economic crises, as a Keynesian position might suggest, for crises were perceived differently in the corresponding theoretical schemes.

Schumpeter analysed business cycles as contours of capitalist development, with prosperity and recession as basic phases. This included an acknowledgement of the role of the financial sector as the provider of purchasing power for innovative uses, thus contributing to the stimulation of cyclical fluctuations. In other words, the development function of the financial sector contains the rational selection of entrepreneurial ventures, hence it is indispensable in the support of innovation with all its revolutionising effects, including crisis phenomena. Hence, the decisive problem lies not in the assessment of development functions, but in the perception of the

[116] The latter statement corroborates an interpretation in which the capitalist, basically the banker, exhibits an active role of allocation, as he channels capital to the most productive uses. This counters notions of a passive intermediation of savings from supplying savers to demanding investors who compete for money, contributing to the coordination of money supply and demand (Winkler 1998: 21n).

development process as a whole. Differences between Schumpeter and Keynes in modelling the financial sector thus reflect underlying differences in the vision of the economic process, that is differences between Schumpeterian evolutionism and Keynesian stagnationism. Furthermore, corresponding to the role of rationality and rationalisation in the Schumpeterian development theory, Schumpeter's emphasis on rational calculation in the functions of the financial sector remains a necessary component of his scheme of development functions, for it complements the irrational elements of entrepreneurial leadership in innovation.[117] Both of these rational and irrational elements need to be taken into account, as they stand for the functional effect of capitalist and non-capitalist institutions, which are recognised as indispensable for the reproduction of modern capitalism.[118]

Paralleling the monetary domain as a manifestation of capitalist rationality, and thus also as an institutional driving force of rationalisation, Schumpeter highlighted the sphere of modern science. Invention was introduced as a specific development function that would go along with innovation and finance, although it was said to become an endogenous factor of the economic process only in the historical course of capitalist development. In fact, Schumpeter was well aware of the Marxian aspects of that argument, as Marx had listed progress of science and technology under capitalist conditions as a specific product of bourgeois class culture, that is as an outcome of the specific rationale governing modern capitalism (Schumpeter 1949b: 210). In terms of the corresponding notion of rationalisation that had been taken to the fore by Weber and Sombart in discussions of the Historical School, then, this implied that the commercial penetration of scientific endeavours would at least cause the economic endogenisation of invention.

Initially, Schumpeter declared that inventions were of importance for economic development only in so far, as they would provide entrepreneurs with workable opportunities for carrying out innovations, meant as marketable applications of these inventions. Hence, according to Schumpeter, there is no automatism in the area of technological and organisational change which would lead to persisting progress in the production apparatus of an economy, based on the actual state of available knowledge (Schumpeter 1912: 479n). Consequently, in order to become relevant for the economic process, new knowledge, in terms of inventions based on exogenously generated scientific ideas, needs to be transformed to entrepreneurial innovations as an expression of commercial practice.

Indeed, the mere creation of ideas does not affect the economic process as long as these remain in the domain of inventions and are not carried into effect through commercial applications. Moreover, some innovations are not at all based on a specific invention, that is, on a specific act of knowledge creation, usually with a scientific background. In Schumpeter's argumentation, the latter case should underline that both development functions tend to differ substantially (Schumpeter 1926a: 129). Thus, invention could be considered as a case of external economies, while economic novelty, not scientific novelty, should characterise innovation:

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[117] In this context, it has been claimed from a post-Keynesian position, that the financial instability of modern capitalism calls for the establishment of a central authority, like a central bank, which intervenes in financial markets, thus acting as "the ephor of the ephor of the financial structure" (Minsky 1990: 56).

[118] Apart from these concerns with the matter of rationality and institutional order, it may be true that Schumpeter's differentiation of bankers and entrepreneurs actually reflected hegemonic clichés in the contemporary Viennese atmosphere of social values, distinguishing entrepreneurial newcomers in industry and established banking elites in finance (Streissler 1981: 78n).

> "(I)t is not the knowledge that matters, but the successful solution of the task *sui generis* of putting an untried method into practice – there may be, and often is, no scientific novelty involved at all, and even if it be involved, this does not make any difference to the nature of the process" (Schumpeter 1928b: 378).

Moreover, the assumed exogeneity of invention was also derived from the thesis that invention and innovation would belong to different social processes (Schumpeter 1939: 85n). In this context, underlining the specificity of invention, Schumpeter referred most favourably to the contemporary theoretical framework of Gilfillan's sociology of invention (Schumpeter 1939: 85). The latter portrayed invention as a cumulative evolutionary process, proceeding gradually, basically providing a "new combination" of previously known ideas without necessarily responding to aggregate social needs (Gilfillan 1935/1970: 5n).

Contrasting with the requirement of entrepreneurial intervention in transforming inventions to innovations, Schumpeter maintained that the introduction of inventions seemed to proceed almost automatically. Moreover, inventions would not pose a constraint on the activities of entrepreneurs, for knowledge was perceived to be ubiquitous and readily available: "New possibilities are continuously being offered by the surrounding world, in particular new discoveries are continuously being added to the existing store of knowledge" (Schumpeter 1934: 79). Therefore, the exogeneity of invention in Schumpeter's original scheme, placing invention beyond a primacy of economic incentives, excluded problems in the identification and application of promising projects for commercial application. Thus it seems that Schumpeter brought up a notion of objective knowledge that pointed primarily to accessible types of formal scientific knowledge.

However, Schumpeter proposed: "Inventions did not create capitalism, but capitalism created by itself the necessary inventions" (Schumpeter 1912: 479, translation by author). While this position dismissed Marxist orthodoxy of the primacy of productive forces in determining the mode of production, it was in agreement with Marxian arguments, also promoted by Weber and Sombart, that science and technology tend to become endogenous factors in capitalist development, due to incentives associated with the rationality of bourgeois culture.[119] Viewed historically, the carriers of the inventive function had never been clearly separated from entrepreneurs and capitalists. Schumpeter reported that even in the beginning of the 19th century, the types of the inventor and the entrepreneur were not to be distinguished unambiguously in practice, as the type of the inventor-entrepreneur remained influential; a result of the insufficient organisation of the credit system (Schumpeter 1926a: 208n).

Still, with the emergence of professional research departments in industrial enterprises and the institutional dispersal of the entrepreneurial function in large bureaucratic organisations, the integration of invention and innovation reflects an ongoing rationalisation of modern capitalism. Therefore, Schumpeter maintained that the distinction between entrepreneur and inventor would be increasingly blurred in the course of capitalist development, actually paralleling the institutional interference of finance with industrial entrepreneurship (Schumpeter 1942: 110). Nonetheless, in spite of that process of institutional integration, the analytical distinction of invention and innovation as particular functions remains a useful device, for it serves a recognition of their historical specificity. Indeed, in the Schumpeterian scheme, the rationalisation of the economic process corresponds with distinct phases of capitalist development that are

[119] These specific incentives are of course related to the profit motive in modern capitalism, which tends to stimulate the endogenisation of invention on a motivational level (Rosenberg 2000: 11n).

mirrored by a perception of Kondratieff cycles as historical individuals, characterised by a specific institutional atmosphere.

5.3 BUSINESS CYCLES AND DEVELOPMENT PHASES

Schumpeter considered business cycles as essential features of the capitalist economic style in its fully developed form, with innovation as their causal source, thus dismissing their interpretation as chance constellations during historical processes (Schumpeter 1926b: 39n). The type of business cycle originally identified by Juglar, covering a range of seven to nine years, provided a point of departure for Schumpeter's earliest exposition of that subject, which had its roots in crisis theory (Schumpeter 1915a: 1n). This orientation prevailed in both editions of the "*Theorie*", whereas Schumpeter argued later on, that different types of cycles needed to be distinguished. Thus, as presented in "Business Cycles", he came forward with the triple scheme of overlapping cyclical patterns, involving the Juglar, Kitchin, and Kondratieff types, differentiated according to the specific economic effect of innovations, especially regarding periods of gestation and their absorption in the economic system (Schumpeter 1939: 169n).[120] Due to its inherent recognition of the historical dimensions of economic change, the notion of the long waves of economic development, related to the contributions of Kondratieff and Spiethoff, then represented the focus of analytical interest.

Schumpeter actually presented the Kondratieff cycle as the manifestation of a comprehensive economic and socio-cultural process; an argument that echoed the Schmollerian concern with development cycles as an expression of processes which affect the economy as a whole. Thus, in Schumpeter's scheme of business cycles, the Kondratieff cycle was not linked to a specific innovation, but rather to the industrial process of a particular epoch (Schumpeter 1939: 168). Schumpeter's pioneering presentation of that specific long-range view then proceeded as follows, invoking the standard example of railroadisation as a major innovation which affects the whole economy in driving evolutionary change:

> "The railroadization or electrification of a country, for instance, may take between one-half and the whole of a century and involve fundamental transformations of its economic and cultural patterns, changing everything in the lives of its people up to their spiritual ambitions" (Schumpeter 1935: 7).

This perspective should allow for dealing with empirically observable institutional and social patterns as endogenous features of the economic process. In other words, Schumpeter acknowledged the interdependence between the evolution of capitalism and complementing social and socio-psychological dimensions as an integral part of the business cycle approach (Schumpeter 1939: 700). The corresponding procedure of giving up the distinction between economic process and institutional data thus aimed at the preparation of a comprehensive analytical framework that would highlight the interaction of economic, social, and cultural components in the development process, as indicated by the Kondratieff cycles. The Schumpeterian perception of innovation and competition, however, with its references to the Marxian vision of capitalist development, should provide a common understanding of that process:

> "We will glance at the social process as a whole and in so doing adopt the convenient, though possibly inadequate, hypothesis of Marxism, according to

[120] The related research program had been already presented in Schumpeter's essay "The Analysis of Economic Change", published in 1935, well before the Keynesian "General Theory" took off to dominate the contemporary economic discourse (Schumpeter 1935: 2n).

> which social, cultural, political situations and the spirit in which and the measures by which they are met, derive from the working of the capitalist machine. Our cyclical schema lends itself to this view, not only because of the length of its longest wave, which brings long-run social changes within the reach of business cycle analysis, but also because it stresses that kind of economic change that is particularly likely to break up existing patterns of and to create new ones, thereby breaking up old and creating new positions of power, civilizations, valuations, beliefs, and policies which from this standpoint are, therefore, no longer 'external'. The standard illustration is afforded by those innovations which drove the artisan's shop into modest reservations, and, together with the artisan's shop, also the artisan's world" (Schumpeter 1939: 696).

In addition to that characterisation of comprehensive changes underlying the Kondratieff cycles, including technological and structural aspects, as well as institutional elements like the spirit of the epoch under consideration, that is the hegemonic values as well as related political forces, also the spatial dimension was taken to the fore. In presenting this topic, which was also a major component of Marxian and Schmollerian approaches, Schumpeter then maintained that economic evolution would include a relocation of industries, allowing for the rise and decline of specific locations, principally regions which may be brought into cultivation or abandoned in industrial terms, thus altering the landscape of whole economies (Schumpeter 1939: 270n).[121]

Yet the matter of business cycle analysis, together with the recognition of the multi-dimensional character of economic change, raised the problem of historical periodisation. Indeed, according to Schumpeter, the empirical material seemed to provide substantial evidence for proceeding with a preliminary periodisation of Kondratieff cycles as "historical individuals", representing distinct formations with a specific technological and institutional character. The corresponding delineation of three particular Kondratieff cycles in capitalist development, however, involved explicit caution regarding detailed periodisation and cyclical regularity. The first Kondratieff cycle, ranging from the 1780s to 1842, should mirror the impact of the industrial revolution in Western Europe, basically dealing with an early capitalist setting of technologies and institutions that evolved during the Industrial Revolution. The second Kondratieff cycle, ranging from 1842 to 1897, should represent a so-called Bourgeois Age of steam and steel, highlighting the industrial process of developed capitalist economies, with railroadisation as a decisive innovation-driven component. The historically related institutional pattern of private sector entrepreneurship and associated banking activities should also provide the material for Schumpeter's theory of economic development. The third Kondratieff cycle, dated from 1898 onwards, was perceived as a reflection of the economic impact of those innovations rooted in the industrial domains of electricity and automobiles, among others. Due to specific tendencies in economic and political terms, involving the ongoing rationalisation of economic life, it was

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[121] Schumpeter illustrated these concerns as follows. "Railroadization may again serve as example. Expenditure on, and the opening of, a new line has some immediate effects on business in general, on competing means of transport, and on the relative position of centers of production. It requires more time to bring into use the opportunities of production newly created by the railroad and to annihilate others. And it takes still longer for population to shift, new cities to develop, other cities to decay, and, generally, the new face of the country to take shape that is adapted to the environment as altered by the railroadization" (Schumpeter 1939: 168).

labelled the Neo-Mercantilist Kondratieff (Schumpeter 1939: 170).[122] Kuznets presented a corresponding chronology of the Kondratieff cycles, depicted in Figure 5.1, that was approved by Schumpeter before its publication (Kuznets 1940: 261).

Figure 5.1: Schumpeter's chronology of Kondratieff cycles

	Prosperity	**Recession**	**Depression**	**Revival**
Industrial Revolution Kondratieff, 1787-1842: Cotton Textile, Iron, Steam Power	1787-1800	1801-1813	1814-1827	1828-1842
Bourgeois Kondratieff, 1842-1897: Railroadisation	1843-1857	1858-1869	1870-1884/85	1886-1897
Neo-Mercantilist Kondratieff, 1897 – to date: Electricity, Automobile	1898-1911	1912-1924/25	1925/26-1939	

Source: Kuznets (1940: 261)

Schumpeter's presentation in "Business Cycles" met fierce criticism regarding the empirical validity of the statistical material. Doubt was expressed primarily regarding the cyclical regularity as well as the actual mechanism of the clustering of innovations (Staley 1986: 11n). In particular, Kuznets' criticism of the "Business Cycles" focussed on Schumpeter's thesis of a "bunching" of innovation over time, whereas a conceptually sound theory of business cycles would have to deal with time lags between the emergence of inventions and the historical timing of the Kondratieffs based on the carrying out of innovations (Kuznets 1940: 263n). Apart from that, Kuznets also pointed out that the introduction of major innovations most of the time preceded the period of the Kondratieff cycle with which they were usually associated (Kuznets 1940: 267n). Therefore, significant problems concerning an empirical elaboration on the sequence of invention, innovation and diffusion in Schumpeter's statistical exposition of business cycle analysis seemed to persist.[123]
However, abstracting from the narrow statistical framework of the business cycle scheme with its periodisation of Kondratieff cycles, the relevance of delineating specific phases in the development of modern capitalism, as rooted in distinct technological and institutional patterns, maintained its relevance for Schumpeterian thought. In this case, contemporary Marxian concepts remained influential, although they were

[122] This periodisation of the Kondratieff cycles was inspired by Spiethoff's related attempts, presented in a seminal article on "crises", in which he dated the beginning of a "high capitalist epoch" in the 1820s, portraying it as the phase of the consolidation of the institutional forms and economic structures of the nation-state, with particular cycles identified since 1820 in Great Britain and since 1840 in Germany, according to an indicator of economic activities that should depict the utilisation of iron. (Spiethoff 1925: 47n)
[123] This viewpoint has been related with the claim that Schumpeter was not coping with technical change as a specific topic, approaching invention and innovation as complex processes, for his actual concern with innovation was associated with the broader context of capitalist development (Heertje 1988: 84n).

overshadowed by the impact of ideas that had emerged from within the German Historical School, especially from Sombart's scheme of economic systems with its early, high and late development phases. Indeed, the concern with specific phases of capitalist development evolved only after the second edition of the "Theorie" was published in 1926, running parallel with the research interest concerning the institutional and technological character of Kondratieff cycles as historical individuals. Similarities between the notions of Kondratieff cycles and phases of capitalist development were related to the question whether capitalism would break down in the context of a prolonged crisis, or whether it exhibited an inherent capability for restructuring in the context of a development process shaped by business cycles and distinct development phases. Both concepts thus confronted the crisis theory of orthodox Marxism. However, despite the resemblance, they were settled on distinct levels of argumentation.

Pointing to the specificity of certain development phases then posed the problem of specifying their duration. Regarding this problem, Wieser's "principle of continuity" was consulted, meant as a macroscopic position on the continuity of historical processes that would impede the accurate historical periodisation of economic epochs (Schumpeter 1939: 227). Nonetheless, Schumpeter turned to a characterisation of distinct phases of capitalist economic development, consistent with institutional characteristics, including a specific mechanisms of competition and selection. Like Sombart, who had pioneered the notion of formulating distinct phases in the evolution of economic systems before, so was Schumpeter inspired by the question whether modern capitalism was evolving towards socialism. Indeed, the process of social rationalisation provided the Schumpeterian scheme of economic development with an essential rationale, specified by the particular phases of capitalist development that would potentially lead to the rise of socialism (Dahms 1995: 11).

Most arguments on the feasibility of socialism had already been formulated in an essay on the "possibilities of socialism", published in 1920, that is in the aftermath of Schumpeter's intermezzo as a political activist in socialist dominated government bodies of Austria and Germany. In this essay, institutional changes that altered the character of the market economy, and thereby seemed to prepare the ground for socialism, were not yet described as a specific phase capitalist development, but as indicators of socialist transformation. Industrial concentration and the emergence of corporate trusts would lead to the economic dominance of bureaucratic organisations, accompanied by a rationalisation of economic life, as indicated by the automatisation of technological progress. This would imply the replacement of personal entrepreneurial by administrative guidance. Rationalisation would also cut loose the economic sphere from pre-capitalist and non-economic sentiments and ties, illustrated by the decreasing role of family values as a motive for the private accumulation of wealth (Schumpeter 1920/21: 312n).

In modification of this transformation scenario, Schumpeter discussed the issue of distinct phases of capitalist development only briefly in "*Theorie*", hinting at rationalisation and trustification in the competitive economy. In order to mark this point, Schumpeter underlined that the nature of economic development would be reflected by the competing down of outmoded agents and structures. New combinations, regularly the new firms embodying innovations, would not simply replace old combinations but rather co-exist with them for some time. This had consequences for the dynamism of the economy as well as for the mechanism of social change, especially concerning the mode of selecting the leading personnel. The competitive economy would fuel social mobility by supporting the rise and decline of individuals and groups,

whereas trustification would imply that competitive selection became an internal process of complex organisations. According to Schumpeter, then, this difference alone sufficed as a division line between two distinct epochs in the social history of capitalism (Schumpeter 1926a: 101n). In a complementing passage on business cycle dynamics, Schumpeter even argued that trustification and the corresponding opportunities for rational calculation would the alleviate cyclical contours of the development process (Schumpeter 1926a: 341). Thus, phenomena that had been perceived before as indicators of socialist transformation were now assessed in terms of a specific phase of capitalist development, supposedly mirroring the contemporary impression that the crisis of capitalism had given way to an institutional transformation within the confines of capitalist development. What seemed to be the advent of socialism was at last interpreted as a new epoch of capitalism.

A more detailed elaboration on the distinct periods of capitalist development was presented only subsequently in a range of articles, including the essay on the "instability of capitalism", published in 1928 as Schumpeter's contribution to debates in the "Economic Journal" concerning the impact of external economies and increasing returns on the foundations of Marshallian theory (Schumpeter 1928b). Moreover, two German essays on the nature of entrepreneurship were put forward, which elaborated on the idea of capitalist development phases in more detail (Schumpeter 1928a; Schumpeter 1929). Schumpeter then dated components of early capitalism in Southern Europe since the 12th century, with its institutional foundations established since the 15th century, whereas the beginning of a capitalist prevalence was observed from the late 18th century onwards, valid at least in the case of the United Kingdom. Then the scheme of historical periods distinguished between the phase of "competitive" capitalism during the 19th century, and the phase of "trustified" capitalism in the 20th century, derived from institutional patterns that could be identified in Western Europe and the United States (Schumpeter 1928b: 362). Accordingly, the period of competitive capitalism would cover the first and second Kondratieff cycles, to be distinguished from the emergence of trustified capitalism in the era of the third Kondratieff.

Curiously, this elaboration on specific periods of capitalism as a reflection of ongoing rationalisation was put forward only after the publication of the second edition of "*Theorie*" in 1926, although the matter had been considered much earlier in corresponding debates, even before the historical experience of an administered "war economy" during World War I. Indeed, specific periods of capitalist development had been highlighted in the context of Marxist debates, for instance in Hilferding's "*Finanzkapital*", published in 1910, with its thesis of an emerging bank-based financial system that would herald the final stage of capitalist development, combined with industrial trustification and a centralisation of administrative power (Hilferding 1910/1968: 507). Thus Schumpeter's notion of trustified capitalism is implicitly indebted to Hilferding's approach, representing positions Schumpeter must have become acquainted with during the discussions in Böhm-Bawerk's seminar at the University of Vienna (Bottomore 1992: 78n).[124] The Kiel party congress of the SPD in 1927 then established Hilferding's related notion of an "organised capitalism" as a programmatic element, perceiving industrial and financial concentration as well as bureaucratic administration in large enterprises as a precondition for socialist

[124] Streissler has claimed that the "*Finanzkapital*" was basically completed already in 1905, hence it should have provided material for academic discussions in Böhm-Bawerk's seminar (Streissler 1994: 30). Nonetheless, Schumpeter later on used to criticise Hilferding's "*Finanzkapitalismus*" with its thesis of an established rule of the financier over industry and politics as a "newspaper fairy tale" (Schumpeter 1939: 405).

transformation. However, it seems that Schumpeter followed primarily Sombart's argumentation, despite the problem of periodisation that had been associated with a differentiation of early, full and late capitalism. The third volume of Sombart's "*Der moderne Kapitalismus*" was also published in 1927, reviewing rationalisation and trustification in "full capitalism". This orientation was actually acclaimed by Schumpeter (Schumpeter 1927c: 349n). All of this echoed the contemporary perception of fundamental institutional changes within the setting of capitalist development, amounting to a specific development phase, which informed Schumpeter's discussion of the subject.

In a subsequently arranged scheme, Schumpeter distinguished even four particular phases in the historical development of capitalism, also including capitalist elements in ancient economies, thus approaching a Weberian perspective on capitalist development phases. Indeed, quite in contrast to Sombart's position, Weber had claimed that elements of capitalism could be traced in ancient economies, that is, in a politically constrained type of ancient capitalism.[125] Accordingly, Schumpeter identified an "early capitalism" in the ancient era, especially in the Graeco-Roman world, defined by the existence of capitalist institutions such as factories that produced for markets and merchants who directed trade. During the Middle Ages, further entrepreneurial opportunities were realised, while the advent of "mercantilist capitalism" since the 16th century coincided with fundamental institutional changes in occidental nation-building. The end of the 18th century then marked the emergence of "intact capitalism", based on rapid advances in technology and organisation, exhibiting the pattern of a bourgeois *laissez-faire* economy that should prevail until the end of the 19th century. Then, the "modern phase" of capitalism set in, accompanied by increasing government interventions, bureaucratic rationalisation, and intensified imperialist conflicts (Schumpeter 1946a: 801n). In this scheme, the phase of intact capitalism would cover the first and second Kondratieff, whereas modern capitalism set in with the third Kondratieff.

According to Schumpeter, then, the pattern of rationalisation underlying these distinct phases of capitalist development would promote the decline of capitalism as a mechanism of economic evolution. Thus the stabilisation of the economic process seemed to be feasible, as the fundamental cause of instability inherent to the capitalist system, namely the discontinuous introduction of innovations by entrepreneurial agents, could be expected to disappear (Schumpeter 1928b: 385). Envisioning the future course of economic life, even a planning of innovations was taken to the fore, for Schumpeter claimed: "(G)iven sufficient power and insight in a central authority, innovation may of course be planned for in such a way as to minimize disturbance" (Schumpeter 1939: 697).[126] This hint at the obsolescence of the business cycle was not to be understood in terms of a serious policy recommendation, but as a statement on the feasibility of

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[125] According to Weber, this type of ancient capitalism differed from modern occidental capitalism in terms of an almost symbiotic association with the political forces and motives of the state apparatus, which obstructed the emergence of those institutions that allowed for the economic dynamism of modern occidental capitalism (Weber 1921/1972: 800n).

[126] This argumentation differed from the discussion of rationalisation in Schumpeter's earliest works. For instance, in his pioneering essay on the theory of economic development, Schumpeter argued that the discontinuous character of economic crises, then perceived as turning points of the development process, were going to be diminished in the future, due to an improved market organisation and a high intellectual as well as moral level of the entrepreneurial personnel. Both factors should express advances of economic culture and learning effects. The development process would become a respected fact of economic life, perhaps supported by adequate monetary measures on well-organised markets, as opposed to futile attempts of regulation by means of state intervention (Schumpeter 1910a: 323n).

socialist planning, based on a perception of bureaucratisation as the major institutional ingredient of a post-capitalist system. Also in this case, parallels with the development schemes of Weber and Sombart were obvious, hinting at a historical tendency that was believed to bring about a fundamental transformation of the institutional order of modern capitalism.

It may be concluded that the phases of capitalist economic development, as outlined by Schumpeter, which were set to exhibit a historical range beyond individual Kondratieff cycles, actually resembled those cycles of socio-cultural evolution that had been addressed in the first edition of the "*Theorie*", then highlighting an evolutionary mechanism of economic and social restructuring by competitive selection (Schumpeter 1912: 492n). Still, in this particular scheme, entrepreneurship was understood as a development function that would be concerned with the introduction of novelty, carried out by historically specific agents. Entrepreneurship thus represents the internal driving force of the development process. Within the Schumpeterian system of development functions, it should complement the domains of invention and finance which were perceived as manifestations of capitalist rationality, based on a spirit of scientific endeavours and monetary accounting. However, in contrast to these rational components of the institutional order of the capitalist civilisation, then, the matter of entrepreneurship pointed to irrational elements in the development process. Indeed, both these rational and irrational elements were perceived as indispensable institutional features of economic evolution. Therefore, grasping the scale and scope of the Schumpeterian research program implies understanding Schumpeterian entrepreneurship, involving its historical specificity in the course of economic development.

6 EXPLORATIONS IN SCHUMPETERIAN ENTREPRENEURSHIP

6.1 AUSTRIAN THEMES IN SCHUMPETERIAN ENTREPRENEURSHIP

Schumpeter suggested that economic analysis had accounted for entrepreneurship since the 17th century, whereas historical and sociological components of that matter were considered seriously only in the research tradition of the German Historical School (Schumpeter 1928a: 480n). This tradition may be summarised as follows. Schmoller underlined the cyclical contours of socio-cultural development as an expression of evolutionary and ethical factors, involving entrepreneurs who exercise the economic functions of risk-bearing and organisation. Still, entrepreneurial activity was assessed with ambiguity, pointing to socially disruptive effects in the modern "machine age". Subsequently, Sombart and Spiethoff elaborated on the historically specific dynamism of capitalist development in terms of the notions of economic systems and styles. Sombart's corresponding concept of entrepreneurship combined a spirit of adventurous heroism with rational calculation, arguing that the latter would gain institutional hegemony in the course of capitalist development. In agreement with the thesis of rationalisation, Max Weber still rejected a heroic perception of entrepreneurship, favouring instead its interpretation in terms of professional rationalisation. However, both Weber and Sombart argued that the charismatic leadership of entrepreneurial agents would retain its importance in all socio-cultural domains.

According to Schumpeter, all of these approaches provided indispensable assistance in formulating a theory of entrepreneurship which could differentiate between functions and carriers of entrepreneurship. Yet they could not deliver such a theory, for they allegedly neglected problems of causality as a condition of economic theorising. As a methodological assessment, this was quite in accordance an inclusion of the institutional aspects of entrepreneurship in economic sociology, meant as a specific technique in Schumpeter's methodological scheme of economic analysis. This consideration is in agreement with an identification of the irrational dimensions of economic behaviour as a key aspect in approaching entrepreneurship from the Schumpeterian perspective. This position would primarily point to Sombart's historical exposition of the various types of entrepreneurship, put forward in the context of his historical theory of capitalist development. However, well in addition to these arguments that have their origins in the German Historical School, also the Austrian School provided conceptual material for further theorising. Indeed, apart form Sombart's influence, also the outstanding Austrian theorist Friedrich von Wieser has been presented as a major influence on Schumpeter's theory of entrepreneurship (März 1983: 98n).

In this context it is noteworthy that an early essay of Wieser's, outlining the Austrian research program, played down the methodological controversy between Menger and Schmoller: "The historical school of political economists in Germany, and the Austrian, or as it is frequently termed, the abstract, school are more nearly related than is at first sight apparent. Both follow the spirit of the age in rejecting speculative theory and in

seeking their highest laurels on the field of observation" (Wieser 1891: 108).[127] Paralleling the impact of Walrasian equilibrium theory, then, Schumpeter indeed referred explicitly to Wieser's inspiration in terms of a "sociology of leadership" which should serve the analysis of entrepreneurship by exploring entrepreneurial leadership in guiding the habitually behaving masses of economic agents (Schumpeter 1926a: XVIII). Indeed, when Schumpeter approached the matter of entrepreneurship for the first time in "*Wesen*", he already emphasised that it belonged to the domain of those irrational phenomena that were to be treated by sociology, for entrepreneurial characteristics would not fit an explanation merely in terms of proficiency or efficiency (Schumpeter 1908: 351).[128] Thus, Schumpeter's references to Wieser's sociology of leadership point to entrepreneurship as a manifestation of irrational aspects in the institutional setting of capitalist development.

The impact of Wieser's ideas is actually underlined by the fact that his general theses on the role of leadership in socio-cultural development had been made available to the academic public long before Schumpeter began his studies in Vienna, for instance in his essay on the evolution of the large firm and problems of collective ownership, published in 1892. Moreover, with regard to the historical context, it has been put forward that the hegemonic intellectual atmosphere of Vienna inspired a heroic interpretation of entrepreneurs as business leaders.[129] Nonetheless, it seems that Wieser's approach to entrepreneurial leadership coined Schumpeter's thought primarily through academic teachings (Streissler 1994: 34n).[130] Therefore, Wieser's theory of entrepreneurship may be approached most appropriately by invoking its position in the broader domain of Austrian economics, providing a variant of marginalist economic analysis in which the concept of entrepreneurship is indispensable for dynamising the economic process. A reconsideration of Schumpeter's statement that economic analysis had accounted for entrepreneurship already since the 17th century, however, highlights the origin of Austrian positions in classical schemes of analysis, especially in the contributions of Cantillon, who laid the foundations for further theorising on that subject.

Indeed, Cantillon excelled not only in pioneering a systematic account of political economy.[131] Moreover, he initiated the theory of entrepreneurship with his "*Essai sur la Nature du Commerce en général*", published posthumously in 1755, according to Schumpeter following scholastic doctrine by emphasising the role of "risk-bearing" directors of production and trade who had to face uncertain receipts (Schumpeter 1954: 222). Subsequent discussions of political economy on the British Isles took little notice of these positions. Adam Smith, for instance, distinguished the profit of capitalists and the wages of management, while the entrepreneur was represented merely by an undertaking business owner, as innovation was derived from the division of labour and

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[127] It may illustrate the selective cooperation between the post-Schmollerian German Historical School and Austrian marginalists that Max Weber, as an editor of the "*Grundriss der Sozialökonomik*", a voluminous exposition of social economics, with a first edition published in 1914, invited Wieser to provide sections on economic theory. Schumpeter then dealt with the history of economic thought.

[128] Correspondingly, on a methodological level, Schumpeter delegated the matter of leadership strictly to the analytical domain of sociology (Schumpeter 1954: 25n).

[129] This would underline the comparable focus on institutional aspects, to be traced in the works of Wieser and Schumpeter. In this view, both focussed on the role of power in economic evolution, located in diverse areas of economy and society, with special reference to the matter of entrepreneurial leadership (Samuels 1983: 12n).

[130] This thesis is illustrated by the detail that Schumpeter's "*Theorie*" was made available in 1911, whereas Wieser's detailed monographic elaboration on the subject of leadership in economic life was published only in 1914.

[131] For instance, he addressed the matter of the circular flow in a manner that anticipated Quesnay's physiocratic model (Schumpeter 1914: 32).

industrial specialisation (Blaug 1986: 167n).[132] Political economy in Continental Europe took a different direction. Say's major works, published in France in the first quarter of the 19th century, presented entrepreneurs as managerial organisers who combined the means of production, while capitalists operated with capital as money lenders (Hébert and Link 1982: 30n). German political economy paralleled these efforts, with Thünen and Mangoldt as outstanding contributors, pinpointing entrepreneurial profit as a premium on uncertainty attached to business ventures. Both innovation and arbitrage were identified as characteristics of the entrepreneurial function, accompanied by organisational capabilities (Schneider 1996: 78).

Neoclassical marginalism then shifted the analytical orientation towards subjective value theory, market exchange and consumption, pointing to a framework, in which scarce resources are allocated to meet given ends. Neglecting the role of entrepreneurship, then, equilibration was assumed to result from a seemingly automatic adjustment mechanism (Hébert and Link 1982: 52n).[133] Walrasian theory represented the most abstract endeavour, resting on a static exchange model. The entrepreneur comes into play as a buyer of services which are used as inputs in production, operating with fixed technical coefficients (Jaffé 1967: 6n). This implied a distinction between capitalists, related with finance, and entrepreneurs, related with the function of linking input and output markets. Due to the zero-profit situation in equilibrium, that is the constellation of "*ni bénéfice ni perte*", the opportunity for entrepreneurial profit arises basically from arbitrage between competitive market prices and average costs. Thus, Walrasian entrepreneurship was essentially meant as an equilibrating force (Walker 1986: 396n).

Schumpeter still suggested that households were the real carriers of economic initiative in Walrasian theory. He proposed that the notion of Walrasian entrepreneurship should be replaced by the impersonal term "the firm", for it would not denote a specific type of initiative or income beyond buying producer goods and selling consumer goods (Schumpeter 1954: 1011). A similar assessment would also apply to the Marshallian perception of entrepreneurship as an organisational factor within the firm. Nonetheless, the dismissal of the Walrasian approach to entrepreneurship did not affect Schumpeter's appreciation for the key concern of Walrasian theorising, namely the static theory of

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[132] Still, in an early draft of the corresponding sections of the "Wealth of Nations", Smith discussed certain types of agents regarding their role in introducing technological improvements. The "artist" proceeds with minor improvements; while major changes are associated with the "philosopher" and the "man of speculation" who is capable of combining the powers of opposite and distant objects (Smith 1763/1978: 570). In this case, Smith's reasoning hinted at the matter of entrepreneurship: "To apply in the most advantageous manner those powers which are already known and which have already been applied to a particular purpose, does not exceed the capacity of an ingenious artist. But to think of the application of new powers, which are altogether unknown and which have never before been applied to any similar purpose, belongs to those only who have a greater range of thought and more extensive views of things than naturally fall to the share of a mere artist" (Smith 1763/1978: 570). Moreover, Smith even claimed a rationalisation of this process: "Philosophy or speculation, in the progress of society, naturally becomes, like every other employment, the sole occupation of a particular class of citizens. (...) More work is done upon the whole and the quantity of science is considerably increased by it" (Smith 1763/1978: 570). In the published version of the "Wealth of Nations", then, these passages focussed on the division of labour as the crucial mechanism in technological change (Smith 1776/1976: 20n).

[133] The essentials of the "marginalist revolution" of neoclassical economics have been summarised by the concept of opportunity costs, rational behaviour and individual choice, as well as problems of information procession that lead to the question of stabilising equilibrium constellations. These essentials informed. the neoclassical view on economic growth, which was derived from individual choices, thus countering the classical surplus approach, while an optimal allocation of resources was said to be the crucial determinant of the national product (Spengler 1973: 211n).

general equilibrium, allowing for an adaptive equilibration mechanism that would be related to the allocative functions of market prices.
The Austrian School in the Mengerian tradition, however, represented a variation of neoclassical marginalism that promoted the case for entrepreneurship most explicitly, representing a strand of theorising that accounted especially for the matter of uncertainty, knowledge and time in production (Martin 1979: 272n). Accordingly, Menger's theory of value and prices, underlying the theory of production, has been portrayed as an information theory under uncertainty in which imperfect competition and disequilibrium prevail, for adaptation to new equilibrium positions remains time consuming (Streissler 1973: 161n).[134] Menger's approach to entrepreneurship is part of his theory of production, in which the intertemporal coordination of the factors of production is of paramount analytical importance, with the entrepreneurial position depending on the knowledge-based direction of resources on markets and in the production process (Hébert and Link 1982: 59n).
Menger's corresponding argumentation rested on a typology of goods, reflecting the time structure of production and its rationale, namely the satisfaction of consumptive needs. Higher order goods are used as investment goods in order to produce lower order goods, approaching goods of the first order which are directly used for consumption. This structuration indicates that production is time-consuming, as its outcome, that is the transformation of higher order goods to lower order goods remains uncertain (Menger 1871/1923: 27n). These arguments shaped the Mengerian concept of entrepreneurial activities.[135] The latter would include information on the economic situation, calculation required for arranging production; an act of will by which higher order goods are supplied to production, as well as supervision of actual production, but definitely not risk-taking. Entrepreneurial activities could be exercised by an individual in small enterprises, while they were often split among employees in large enterprises (Menger 1871/1923: 154). The function of credit, however, would lie in the provision of higher order goods to those entrepreneurs who could transform them to lower order goods (Menger 1871/1923: 153).
Hence, Menger sampled entrepreneurship, production and credit in a common framework, stressing the satisfaction of already established consumptive needs as a rationale of entrepreneurship, thus leaving out the matter of radical innovation. In the succeeding generation of Austrian economists, Böhm-Bawerk's theory of production added nothing specific to that scheme. Supposedly, this may have been due to his analytical focus on time preference in the intertemporal coordination of production, presenting a productivity-oriented theory of capital and interest that was harshly criticised by Menger. Instead, it was Wieser, Menger's successor at the University of Vienna, who excelled in the Austrian School of marginalist economics with his theses on entrepreneurial leadership, well in addition to his price theory of imputation (Streissler 1981: 66n).[136] A key position of Wieser's was provided by the proposition

[134] Indeed, compared with the related theories of Walras and Jevons, it has been proposed that the Mengerian position resembled a kind of institutional economics (Jaffé 1976: 520).
[135] Entrepreneurship was outlined as follows: "The process of transforming higher order goods to lower order goods, respectively first order goods, if it is still an economic one, furthermore demands under all circumstances that it is arranged and led in an economic sense by an economising subject, that is, it proceeds with economic calculations, referred to above, and supplies or lets supply the higher order goods, including technological performances, to the process for real" (Menger 1871/1923: 153, translation by author).
[136] Lasting Wieserian contributions to economic theory include the concept of optimal resource allocation according to marginal productivity of the factors of production and the role of prices as carriers of information (Streissler 1986: 85).

that a useful economic theory with analytical relevance for the situation of modern capitalism should deal with power as a decisive economic phenomenon (Wieser 1914: 235n). A conceptual background was offered by contemporary sociological theories on the behaviour of masses and the necessity of leadership as an organisational device. This concern should involve a rejection of Spencerian evolutionary theory, especially regarding the impersonal sterility attached to its scheme of increasing complexity. In this case, then, Wieser's position resounded the historist critique of Spencerian evolutionism, as put forward by Schmoller.[137] Wieser actually attempted to integrate the personal role of "leaders" as driving forces in the development process, with leadership perceived as a phenomenon prevalent in all areas of social life, involving military, political, religious and economic affairs (Ekkelund 1970: 184).

Indeed, according to Wieser, the impulse for development corresponds with the impact of novelty and leadership:

> "We notice the fact of development, but we do not grasp its necessity. Again and again, unexpectedly and surprisingly, the spark of talent, of genius needed to flare up out of the open space of intellect, in order to open wider the route of development, by the light of a new idea, by the breeze of new sentiment, by the courage for new deed" (Wieser 1907/1929: 340, translation by author).

Still, the masses, necessarily organised by the leading personnel, would play a decisive role in selecting among novelty thus provided and put to practice, yet also deciding on leaders they are in need of. Wieser then argued that this relationship coincided with the tendency for an ever increasing role of leadership during the process of socio-cultural evolution, as general progress in knowledge and culture made the introduction of novelty even more demanding (Wieser 1907/1929: 341n). Again resounding historist debates, a specific pattern of leadership was also put forward as a characteristic of the socio-cultural development of nations in general, for Wieser suggested that historical cycles were to be observed, based on the epochal rise and decline of phases dominated by the power of elite leadership and phases dominated by the liberty of the masses (Wieser 1914: 405).

Wieser's thesis of the role of a small number of leaders in organising the actions of the masses of ordinary economic agents then shaped his position on the role of entrepreneurship in the organisation of the firm: "Due to that general law of society, according to which the mass is only capable to act under guidance, every larger business organisation demands a leader who combines it to a unit of action" (Wieser 1914: 352, translation by author). In accordance with that definition of the entrepreneur as the "economic leader of his enterprise", entrepreneurial profit was defined as a premium on leadership. The corresponding historical variety of articulating the leadership principle should include figures like the master of slave ventures as well as the guild master of craftsmanship; whereas, in the monetary economy of modern capitalism, the type of the entrepreneur would excel, proceeding with capital inputs in order to gain monetary yield (Wieser 1914: 374n).

Attributes of entrepreneurship would contain an intuitive judgement of new business opportunities and their realisation, accompanied by a risk-taking attitude associated with investing capital in new ventures, based on a "joy of playing", but even more than that referring to a "joyful energy of creating" (Wieser 1914: 352n). Capitalist enterprise then serves as a terrain for diverse entrepreneurial types like the "courageous technological innovator", the "organiser who knows human nature", the "far-sighted banker", the

[137] Accordingly, Schmoller expressed his approval of Wieser's sociological explorations, underlining the impression that they would parallel his own views on the institutional dimension of economic life, despite Wieser's proximity to Mengerian positions in economic theory and methodology (Schmoller 1910: 443).

"reckless speculator", as well as the "world-conquering leader of trust organisations" (Wieser 1914: 354). While the leadership function proved to be the decisive aspect of entrepreneurship, it was accompanied by the role of the entrepreneur as a risk-taker, although Wieser argued that risk would be carried also by other contributors to the business venture, namely creditors and labourers. Hence, both leadership capabilities and property of capital were addressed as indispensable conditions for achieving an entrepreneurial position (Wieser 1914: 353, 375).

Consequently, Wieser maintained that the historical emergence of capitalist enterprise was related with "pioneers" who "open up new ways" by making use of technological knowledge and organisational leadership, characterised by the "courage of the innovator" (Wieser 1914: 375n). Large enterprises evolved similarly as a result of entrepreneurial leadership, highlighting visionary drive in analogy with the formation of dynastic empires: "Just as it took the conqueror's characters of Cortez and Pizzaro to establish Spanish rule in Mexico and Peru, so economic *conquistadores* had to come forward, in order to create trust organisations" (Wieser 1914: 406, translation by author). This essence of entrepreneurial leadership persists with the spread of trustification, while market structures are altered by industrial concentration:

> "With regard to the present it needs to be said that the impact of the personal selection of leadership, which is usually assigned exclusively to competition, may be attributed to trusts to the highest degree. They are creations of personalities with an extraordinary talent for business, combining intuitive judgement, knowledge and energy which are necessary for setting up technologically and organisationally modern large enterprises. The rise of these great leaders is nonetheless accompanied by the decline of numerous others, for the number of self-employed entrepreneurs is diminished extraordinarily by the trusts" (Wieser 1914: 286, translation by author).[138]

As a basic proposition in Wieser's approach, then, the increasingly important role of capital in the economic process would correspond with a shift of the institutional role of individual entrepreneurs, promoting distinct types of economic agents. Wieser maintained that the emergence of large bureaucratic enterprises and cartels, which had been responsible for social conflicts in the specific power constellations of an emerging mass society, also stimulated an institutional transformation of entrepreneurship. Although the leadership aspect remained important, the dominant role of capital implied that the former pattern of entrepreneurial activity, evolving from the disposal of small amounts of capital combined with personal genius, gave way to a competitive situation in which entrepreneurial newcomers would face large amounts of already invested capital in certain industries. In the evolution of the modern corporation, personal talent thus would be replaced by the disposal of capital, while technological problems and their solutions could be treated as data, to be solved by professional engineers and managers (Wieser 1892: 110).

Therefore, as large enterprises with monopolistic market power replaced small competitive enterprises, so the transformation of leadership mechanisms evolved from personal superiority to "capitalist supremacy", denoting the command of capital in

[138] Entrepreneurial leaders of trust organisations then achieve an almost hegemonic public status as agents of technological change and innovation: "Public opinion turns towards the new master who brings progress by translating economic inventions of technology to practical application" (Wieser 1914: 406, translation by author).

accumulation.[139] Accordingly, economic competition would be paralleled by personal supremacy, compared with a perspective on corporate trusts as manifestations of economic power (Wieser 1914: 352). The thesis ensued that the personal element in the economic process could become obsolete, just like the position of the entrepreneur as an economic agent attached to enterprise by specific property rights. Indeed, Wieser observed a tendency in large enterprises that seemed to hint at the dissolution of private entrepreneurship, for an application of property rights would be increasingly constrained by the separation of ownership and management. Hence, Wieser announced a transformation towards a collective and bureaucratic-administrative type of enterprise, in which economic leadership and enterprise were detached. The emerging mass character of economic life was illustrated by invoking the image of anonymous shareholders and employees in the bureaucratic structures of corporate business organisations (Wieser 1914: 354n). Nonetheless, Wieser had also pointed out that entrepreneurial leadership would retain its function of establishing organisational discipline and guidance even in the setting of a collectivist constitution of property rights. Thus, also a socialist society would be in need of entrepreneurial positions (Wieser 1892: 122).

This perspective on the dynamism of capitalism and its possible decline resounded a broader discourse on the advent of socialism and its Marxist prophets that had been prevalent not only in the domain of Austrian marginalism, but also in the discussions of the German Historical School. Menger believed in a continuous process of bureaucratisation, and so did Wieser who elaborated on his "sociology of leadership" during the final crisis of the Austro-Hungarian empire, fuelled by the political rise of social democracy and the ideological demise of bourgeois liberalism. This historical context, which also shaped the formative years of Schumpeter's early writings, influenced as well the theoretical controversies with Marxism in which Böhm-Bawerk's criticism of the labour theory of value excelled. In agreement with this orientation, then, Wieser also confronted Marxian ideas, especially regarding the theoretical aspects of economic organisation in a collectivist setting (Streissler 1986: 100).[140] Subsequent Austrian contributions to the socialist calculation debate, as presented after World War I by Mises, among others, were put forward with regard to the same set of problems, namely a critique of socialist organisation.[141]

Schumpeter's research interest in the economic possibilities of socialism also belonged to this intellectual perspective, outlined by Wieser, as did his vision of capitalist evolution in general. Actually, this assessment applies not only to the "principle of

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[139] This tendency of an evolving type of impersonal power based on the centralised control over accumulated capital constitutes a key characteristic in Wieser's account of modern capitalism (Ekkelund 1970: 187).

[140] In particular, Wieser's explorations in the institutional aspects of modern capitalism, as exemplified by his early work on large firms and collective ownership that was put forward with regard to debates on socialisation, underlined the motive of social reconciliation by cultural education as a solution to intensified class struggles (Wieser 1892: 102n).

[141] Regarding the underlying political orientation, however, differences prevailed. Wieser postulated a redefinition of traditional liberal positions in terms of a recognition of power constellations in society, thus favouring corporatist solutions to social fragmentation (Yagi 2001: 98n). Moreover, his endorsement of market interventions was at odds with Austrian positions of uncompromising market liberalism. This constellation, although not necessarily related with specific political positions, was even mirrored by contemporary arguments on the fate of political liberalism. Indeed, since the 1920s, Mises even sympathised with the fascist response to the persistent socialist challenge (Streissler 1986: 83n). It is safe to suggest that Schumpeter's well documented political conservatism followed a comparable, yet still different line of reasoning, whereas the individualist legacy of liberalism was resumed by those strands of thought that would be associated with Mises and Hayek.

continuity" in historical processes, put forward by Wieser and utilised by Schumpeter most explicitly, but it is also relevant with regard to Wieser's definition of innovation as a key factor in economic development, underlining the competitive nature of technological change:

> "The inventor's spirit is going to envision still many more technological revolutions, and any of these that provides relevant advantages which are worth mentioning will be carried out for sure, in the face of all others. Like the horse cart by the railway, so will the railway be replaced without mercy by the airship, if this should be run more consummate and cheaper" (Wieser 1892: 111, translation by author).

Obviously, this picture of the mechanism of innovation anticipated Schumpeter's subsequently elaborated position. Indeed, Wieser pointed to the nexus of invention and innovation in terms of an efficiency-oriented commercialisation of visionary advances in knowledge. This argument even highlighted Schumpeter's standard example of the railway as a revolutionary type of innovation. Therefore, apart from the impact of the German Historical School regarding the institutional analysis of capitalist development, then, Schumpeter's theorising on entrepreneurship and innovation represented a significant extension of Wieser's ideas.

6.2 THE ENTREPRENEURIAL FUNCTION

Schumpeter's theory of economic development approaches innovation as the internal driving force of evolutionary change, based on the idea that novelty does not evolve harmoniously from within an economic setting, but rather places itself alongside established patterns and then competes them down (Schumpeter 1939: 241). In the context of the institutional order of modern capitalism, innovation is carried out by the means of entrepreneurial leadership, recognised as a significant development function. According to the underlying theoretical scheme of functions and returns, the entrepreneur typically carries out innovations by setting up a firm, credit-financed by capitalists who represent the rational, risk-bearing element in capitalist development.[142] Cost-related competitive advantages in market competition that are created by innovations, which take basically the form of new goods or new methods of production, then generate an entrepreneurial profit that serves as a material incentive for entrepreneurial activity in modern capitalism.[143] Therefore, Schumpeterian entrepreneurship as the decisive internal carrier of economic change in modern capitalist economies exhibits an importance far above the impact of any other single factor in the development process (Schumpeter 1926a: 93).

This basic scheme in the theory of economic development was augmented by institutional aspects which should highlight the role of economic sociology in the Schumpeterian approach to economic analysis by referring to specific types economic behaviour and their institutional context.[144] Accounting for these institutional aspects,

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[142] Risk-bearing is actually not a part of that entrepreneurial function, as Schumpeter claimed that entrepreneurs would not bear economic responsibility in the case of failure, even if informal and non-material damage was done (Schumpeter 1926a: 217).

[143] This scheme is in agreement with Schumpeter's claim that the functional character of theorising on entrepreneurship rests on the proposition of attributing entrepreneurs certain functions in the economic process, while explaining the corresponding gains with respect to the carrying out of that function (Schumpeter 1954: 895).

[144] It has been noted that human action as a sociological topic was driven out of the static approach in Schumpeter's "*Wesen*", only to be reintroduced later on in the "*Theorie*", in which the process of

Schumpeter actually defined enterprise and entrepreneurs simultaneously, thus underlining the role of the firm as the institutional terrain of entrepreneurial activity, while alluding to the underlying idea that entrepreneurship is not necessarily linked to firms: "Enterprise we name the carrying out of new combinations as well as their embodiment in firms etc., entrepreneurs those economic subjects whose function it is to carry out the new combinations and who are the active element thereby" (Schumpeter 1926a: 111).

Hints at the theory of entrepreneurship were already presented in "*Wesen*". There, Schumpeter approached the behaviour of ordinary economic agents in a static economic setting, subsequently denoted as the circular flow, by highlighting an orientation towards equilibrium, as he portrayed these agents as subjects "without ambition, without enterprising spirit, in brief, without energy and life"; hence resembling the image of an "equilibrium man", stuck in routines and ignoring the exploration of "new ways" (Schumpeter 1908: 567n). Therefore, the economic world described by static theory was perceived as "bureaucratic" and "quietist" in reflecting essential aspects of the routine forms of human action (Schumpeter 1908: 568n). In contrast to that, the notion of "effort" was put forward as a representation of those "energetic" elements that would represent the internal sources of economic change, to be explored by dynamic theory (Schumpeter 1908: 596n). Implicitly articulating a concern with entrepreneurship as a driving force of business cycles, Schumpeter then even suggested that phenomena like the "will to power" could serve as a fundamental argument for elaborating on a general approach that would deal with major changes of economic epochs from a historical perspective (Schumpeter 1908: 618).

Schumpeter discussed the matter of leadership in a more extensive form for the first time in his pioneering essay on business cycle analysis, published in 1910. There, Schumpeter described the entrepreneur as a specific type of economic agent, endowed with an amount of "energy and intelligence" that would make him special as compared with "static economic subjects" (Schumpeter 1910a: 282). In particular, he pointed out that entrepreneurs would meet resistance against the introduction of routine-breaking novelty, additionally facing inappropriate legal frameworks and technological conditions, while they would need to secure their financial resources. Leadership then implied that pioneering efforts paved the way for related activities of less daring agents, who could proceed with their innovations in an institutional context that adapted to the new economic situation, including the stepwise establishment of adequate legal norms and associated contractual arrangements (Schumpeter 1910a: 298n).

In this context, uncertainty would contribute to the exercise of entrepreneurship, as it allowed for imagination, whereas perfect foresight would obstruct innovation, for instance regarding an assessment of the competing away of entrepreneurial profits on markets that were yet to be created (Schumpeter 1910a: 309n). This appreciation of uncertainty in the entrepreneurial drive for economic change was in agreement with Schumpeter's claim, put forward in a review of economic theorising in the United States, also published in 1910, that neoclassical theorists like J. B. Clark would neglect the problem of novelty in their approaches to economic development, although they addressed phenomena of technological and organisational progress. Thus, they would fail to take notice of the specific situation that production is not moved by the "herd of consumers", but guided by "leading personalities" (Schumpeter 1910b: 50n).

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economic development was embedded in non-economic dimensions, based on the notion of entrepreneurship as a specific type of behaviour (Osterhammel 1987a: 49n). This is why Schumpeter's theory of economic development has been assessed as an outstanding effort in dealing with human action, as represented by the notion of entrepreneurial behaviour (Redlich 1964: 88).

In the first edition of the "*Theorie*", Schumpeter then expanded these analytical efforts, primarily elaborating on the thesis that entrepreneurship would be based on imagination and action, that is the creative realisation of an imagined opportunity. This mechanism was interpreted as a most relevant source of change in diverse areas of socio-cultural life, above all in politics, science and the arts, while it had emerged as the internal driving force of development more specifically in the economic sphere of modern capitalism, in interaction with the other components of its institutional order (Schumpeter 1912: 124n). A comprehensive characterisation of the entrepreneurial personality, assuming personal entrepreneurship as the typical pattern of competitive capitalism, was presented accordingly, pinpointing the role of leadership:

> "Like the carrying out of new combinations is form and content of development, so is the deed of the leader its driving force. Were all economic subjects equally far-sighted and energetic, then our image of the economy, naturally, would come about differently. But it is not like that, and we mean that in this case gradual differences of personalities, which are principally irrelevant for the simple logic of the economy, become essential aspects of explanation of the events" (Schumpeter 1912: 162, translation by author).[145]

This argumentation mirrors Schumpeter's thesis that habitual routines govern economic behaviour in the absence of novelty and discontinuous change, releasing individuals from the necessity of permanently reconsidering of their activities: "Everything we think, feel, or do often enough becomes automatic and our conscious life is unburdened of it" (Schumpeter 1934: 84). Thus, Schumpeter claimed that the motives of ordinary economic agents, representing the constellation of the circular flow, were not based on rational choice and egoistic hedonism, but on habitual patterns of thought and beliefs, meant to satisfy given wants that are also shaped by the social environment (Schumpeter 1926a: 132n). The corresponding scheme of economic behaviour then distinguished between static and dynamic types of behaviour, based on hedonistic and energetic motives respectively (Schumpeter 1912: 128). In particular, then, ordinary and entrepreneurial agents could be distinguished, corresponding with a distinction of spontaneous and creative behaviour on the one hand, as compared with habitual and adaptive behaviour on the other hand (Schumpeter 1926a: 119).[146]

Schumpeter's suggestion that the carrying out of innovation would be based upon entrepreneurial leadership pointed to the argument that innovation implied the disruption of routines which had governed the behaviour of economic agents in the circular flow, fuelling the resistance of the social environment against the carrying out of innovation. The radical change of data that had been conventionally used as guideposts for calculation would lead to a decomposition of habitual attitudes and experience-based rationality, hence, autonomous adaptation becomes impossible for ordinary economic agents. The latter would depend on the visionary guidance of

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[145] This characterisation was reformulated in the second edition of the "*Theorie*", for which Schumpeter completely reworked the second chapter on entrepreneurship, with less emphasis on the individual characterisation of entrepreneurs with their creative heroism and artistic energy. As in the case of the omitted seventh chapter, Schumpeter explained these changes with the need for a more concentrated exposition, supposedly responding to various critical reviews (Schumpeter 1926a: XI). Indeed, these modifications did not imply a diminishing importance of the human factor in Schumpeter's theorising, as it has been suggested recently (Shionoya 1997: 168n). Rather, they signalled a downgrading of heroic individualism in favour of a conceptual extension in the explanation of entrepreneurship, involving different institutional carriers of the entrepreneurial function.

[146] The Schumpeterian entrepreneur so represents a "*homo oeconomicissimus*", conceptually directed against egalitarian principles (Salin 1927: 333n). In this sense, Schumpeterian entrepreneurship is not based upon social nearness, to be traced in a specific milieu, but rather upon distance and difference.

entrepreneurs for proceeding with the design of their new plans of production and consumption, while facing radical uncertainty. Schumpeter thus derived the need for entrepreneurial leadership from the habitual character of ordinary economic behaviour:

> "While in the accustomed channels his own ability and experience suffice for the normal individual, when confronted with innovations he needs guidance. While he swims with the stream in the circular flow which is familiar to him, he swims against the stream if he wishes to change its channel. What was formerly a help becomes a hindrance. What was a familiar datum becomes an unknown. Where the boundaries of routine stop, many can go no further, and the rest can only do so in a highly variable manner" (Schumpeter 1934: 79n).

In this situation, major entrepreneurial tasks would include breaking the inertia of persisting traditions, finding strategic partners, and gaining the acceptance of consumers (Schumpeter 1926a: 125n). Consequently, in stark contrast to notions of organic evolutionary change, innovation needs to be forced upon the majority of routine-oriented economic agents, thus driving discontinuous change. Schumpeter even argued that progress were basically a result of force and confrontation, not of persuasion and cooperation (Schumpeter 1912: 185n). Accordingly, the clustering of innovations that should generate the business cycle pattern of capitalist development was derived from the effects of entrepreneurial leadership, as the latter would remove barriers to innovation and thus enlarge opportunities for further innovations which were carried out by less venturing economic agents (Schumpeter 1939: 100n).

In agreement with this argument, the entrepreneurial function in economic development is characterised by a capability for a creative response to changes in economic data, which is neither predictable nor determined, quite in contrast to the predictability of an adaptive response:

> "Whenever an economy or a sector of an economy adapts itself to a change in its data in the way that traditional theory describes, whenever, that is, an economy reacts to an increase in population by simply adding the new brains and hands to the working force in the existing employments, or an industry reacts to a protective duty by expansion within its existing practice, we may speak of the development of an *adaptive response*. And whenever the economy or an industry or some firms in an industry do something else, something that is outside of the range of existing practice, we may speak of *creative response*" (Schumpeter 1947a: 150, emphasis in original).

The essential features of the Schumpeterian types of economic agents are summarised in the scheme of Figure 6.1.

Schumpeter then maintained that creative response would counter the drive for a bureaucratic rationalisation of capitalism, heralding the advent of the socialist leviathan. With creative response present, the evolution of modern capitalism would remain undetermined. Essentially, due to the persisting creation of new combinations, its future course would remain unpredictable (Schumpeter 1947a: 150). Creative response therefore characterises the quality of entrepreneurship as a historical force that shapes an undetermined trajectory of economic development (Schumpeter 1947b: 8).

However, these developmental aspects and their corresponding mechanism of economic change, rooted in certain behavioural characteristics, were conditioned by the prevailing institutional order which would also be affected by the evolutionary process:

> "It is not simply the increase of the existing factors of production but the incessantly different use made of these factors that matters. In fact much of the increase in factors and particularly of physical capital was the result rather than the cause of what we may identify as entrepreneurial activity. What we observe

> is rather a behaviour pattern, possibly supplemented by a schema of motivation; a typical way of giving effect to the possibilities inherent in a given legal and social system both of which change in the process; the effects of entrepreneurial activity upon the industrial structure that exists at any moment; the consequent process of destruction and reconstruction that went on all the time" (Schumpeter 1949c/1951: 257n).

Accordingly, entrepreneurship as the specific form of economic leadership in capitalist market economies, exhibits characteristics such as a self-interested orientation, a specific selection mode, as well as a mode of commanding the means of production, in this case by purchasing on the markets for the means of production (Schumpeter 1928a: 483).[147]

Figure 6.1: Schumpeterian types of economic agents

	Ordinary Type *"Wirte"*	**Entrepreneurial Type** *"Unternehmer"*
Type of Response	*Predictably Adaptive*	*Unpredictably Creative*
Type of Behaviour	*Experience-Based Habitual*	*Novelty-Embracing Spontaneous*
Type of Motivation	*Hedonistic Calculation*	*Visionary Imagination*
Mode of Action	*Uncertainty-Absorbing Routine*	*Uncertainty-Spreading Innovation*
Mode of Change	*Slowly Gradual by Administering Structures*	*Rapidly Discontinuous by Creating Structures*

Source: adapted from Ebner 2000b: 83, Table 1.

However, this logic of Schumpeterian entrepreneurship was not associated exclusively with the institutional setting of capitalist market economies. Rather, it should represent a general principle which is not only of utmost relevance in different areas of social life, but also in different historical formations. Indeed, echoing Wieserian ideas, Schumpeter emphasised the corresponding nexus between novelty and leadership as follows:

> "Social leadership means deciding, ordering, carrying out, forging ahead. As such it is special, both within the actions of the individual, and within the social whole always a distinguishable function. It is to be considered only when confronting novel individual and social situations, and it would not exist if the life of the individual and the peoples would run steadily in the tracks of always the same routine" (Schumpeter 1927d: 64, translation by author).

The historicity of that scheme was described by the proposition that the universal nexus of novelty and leadership would manifest itself through diverse carriers which are historically conditioned in their institutional expression. In other words, the essential scheme of introducing novelty into a habitual setting by means of leadership is of universal validity, it may be associated with a market economy in the same way as with a communist economy (Schumpeter 1910: 284). Hence, Schumpeter even claimed that

[147] Due to the thesis of a historical variability of entrepreneurship, it has been argued that Schumpeter's theory is not capable of addressing the institutional specificity of capitalist market economies in encouraging innovation (Choi 1993: 110). However, this is a misinterpretation of the Schumpeterian position which maintains that entrepreneurship, innovation and market competition are capitalist expressions of a general phenomenon of novelty-introducing leadership.

the entrepreneurial function could be fulfilled by the organs of a socialist commonwealth or by the chief of a primitive horde, that is by those agents who would hold the commanding leadership position in their particular institutional and social environment, enabling them to enforce change by introducing novelty (Schumpeter 1926a: 111).

Again, this argument implied references to the Wieserian distinction between guiding leaders and guided masses as a general phenomenon in socio-cultural evolution, in particular expressed by the role of entrepreneurship in the economic sphere (Schumpeter 1928a: 482). Still, in assessing these perspectives, also the differences between Wieser's and Schumpeter's approach need to be taken into account. Wieser's principle of leadership claimed that the masses are unable to organise spontaneously, hence their unguided activity would result in chaos. Entrepreneurial leadership is therefore closely associated with attempts to discipline the masses, representing an organisational force in the development process. Schumpeter obviously accepted this proposition, still he put the emphasis on the role of routine-braking novelty in economic evolution, thus stressing the disruptive impact of entrepreneurial activities which also consisted in the breaking up of established organisational schemes.[148] However, on a conceptual level, the charismatic nature of entrepreneurship coincided with both positions. In this case, the Weberian discussion of entrepreneurship provided further analytical insights.

Indeed, it has been pointed out that the Schumpeterian and Weberian approaches to entrepreneurship agreed on the developmental mechanism of the capitalist process in terms of the disturbance of a circular flow by innovation and imitation, hence setting up tradition and novelty as analytical devices. Schumpeterian entrepreneurship has thus been set in relation with the Weberian notion of charismatic leadership, pinpointing its routine-breaking features that are related with the introduction of novelty in established organisations and industries (Langlois 1998a: 198n).[149] These parallels in the assessment of charismatic leadership notwithstanding, the systematic rationality of the Weberian entrepreneur contrasts with the irrational elements of Schumpeterian entrepreneurship, especially regarding its heroic underpinnings in the first edition of the "*Theorie*" which seemed to be closer to Sombart's combination of irrational heroism and rational calculation.[150]

Again, this constellation was framed by the thesis of bureaucratic rationalisation, presented by Weber and Sombart, meant as a conceptualisation of the institutional dynamism of capitalist development that was shared by Schumpeter regarding its developmental implications. However, it seems that complementary arguments on the

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[148] The sociology of leadership both Wieser and Schumpeter referred to, also discussed by Weber and Sombart, may be perceived as a facet of sociological thought on modernisation at the end of the 19th century, coping with the irrational elements of socio-cultural evolution. Le Bon, for instance, who took issue with the masses as a socio-psychological phenomenon, whereas Michels elaborated on the organisational pattern of political parties, proclaiming an "iron law of oligarchy". Pareto then pointed to the matter of elite circulation. These specific approaches, reflecting a hegemonic intellectual context, may have contributed to an elitist flavour that characterised both Wieser's and Schumpeter's perspectives in that subject.

[149] In particular, the Weberian distinction of charismatic, rational and traditional types of rule seems to highlight decisive characteristics of the Schumpeterian entrepreneur, namely the charismatic, non-traditional and non-rational sources of his industrial leadership (Faucci and Rodenzo 1998: 36). Underlining these parallels, it has been argued that the Schumpeterian entrepreneur represents a specific sub-type of the Weberian charismatic leader (Carlin 1956: 34n).

[150] Still, regarding motivational aspects, it has been claimed that elitist tendencies n both concepts, were accompanied by a rejection of hedonism as a relevant entrepreneurial motivation (Macdonald 1965: 379n).

persistence of personal leadership in complex organisations, also put forward by Weber and Sombart, remained closer to Wieser's original perspective than to Schumpeter's notion of the obsolescence of entrepreneurship, in terms of its dissolution in the organisational body of large enterprises. Consequently, given the complex role of institutional attributes in Schumpeterian entrepreneurship, it becomes problematical to assess the theoretical implications of these attributes as an endogenous factor of the development process. The institutional underpinnings of entrepreneurship thus may be subject to further exploration.

6.3 ECONOMIC BEHAVIOUR AND INSTITUTIONAL VARIETY

According to Schumpeter, the process of rationalisation initiates an erosion of institutional habits and conventions that had been crucial in shaping economic activities. This decomposition of the institutional embeddedness of economic action would result in a behavioural shift towards individualism:

> "The more one focuses on the exploration on cultures, in which the social whole is engaged in economic activities by letting single individuals and groups engage in economic activities, cultures, in which ties have broken away which in others enclose individual or particular group inhibiting or protecting, in which ultimately the single person, fashioned as a personality, created as an individual, fundamentally oriented towards himself, the more one can declare furthermore, that this satisfaction of needs – although only in a broad sense – is affected egoistically" (Schumpeter 1926a: 133n, translation by author).[151]

This evolving type of individualism that seems to be so characteristic for entrepreneurial agents is marked by an individual alienation from the established institutional setting. Apart from the irrational implications of entrepreneurial ambition, then, this situation promotes rational patterns in entrepreneurial activity, confronting habitual routines and cultural milieus:

> "In one sense, he may indeed be called the most rational and the most egoistical of all. For, as we have seen, conscious rationality enters much more into the carrying out of new plans, which themselves have to be worked out before they can be acted upon, than into the mere running of an established business, which is largely a matter of routine. And the typical entrepreneur is more self-centred than other types, because he relies less than they do on tradition and connection and because his characteristic task – theoretically as well as historically – consists precisely in breaking up old, and creating new, tradition. Although this applies primarily to economic action, it also extends to the moral, cultural, and social consequences of it" (Schumpeter 1934: 92n).

In the second German edition of the "*Theorie*", the corresponding passage elaborates more precisely on these entrepreneurial attributes:

> "(H)e is extraordinarily void of tradition and relationships, the true lever of crushing all ties, specifically alien to the system of supra-individual values of the social stratum he comes from as well as of the stratum he rises to; in particular also the path-breaker of modern man and the capitalist mode of life, oriented towards the individual, clear-headed mode of thought, utilitarian philosophy" (Schumpeter 1926a: 134, translation by author).

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[151] This sentence has been completely omitted from the English edition of the "*Theorie*" (Schumpeter 1934: 91n). This fact may be interpreted as an unfortunate instance for a temporary shift in the emphasis of exposition, primarily abridging institutional aspects, during Schumpeter's early Harvard period.

This institutional estrangement belongs to the reasons why Schumpeter claimed the motto "*plus ultra*" as a characteristic device of entrepreneurial ventures, reaching beyond the circular flow of economic routines (Schumpeter 1926a: 137).
However, the related pattern of motivation that drives the actions of Schumpeterian entrepreneurs derives its specificity from the role of economic incentives. Entrepreneurial profits and the corresponding attributes of economic success are not viewed as ends in themselves but rather as means to achieve further ends.[152] These are first of all motivated by the drive for building a family-empire or dynasty, expressed in material terms by an entrepreneurial concern for the "family fortune" (Schumpeter 1949e/1975: 419).[153] The corresponding motivational viewpoint may be related to Schumpeter's basic proposition that families, and not physical persons, would constitute the true individuals of the theory of social classes, for the family represented the decisive unit of social mobility and group behaviour (Schumpeter 1927d: 12n). This proposition is part of Schumpeter's thesis that the selection pattern working through the market mechanism in capitalist development would be accompanied by a rise and decline of individuals and social groups. Creative destruction thus implies not only a restructuring of firms and industries, but also of social positions and hierarchies. Both domains are causally linked to the matter of entrepreneurship:

> "To-day, as well as in the epoch in which the beginnings of this social process were not yet known, the entrepreneurial function is not only the vehicle of continual reorganisation of the economic system but also the vehicle of continual changes in the elements which comprise the upper strata of society. (...) This represents the most important factor of rise in the social scale in the capitalist world. Because it proceeds by competitively destroying old businesses and hence the existences dependent upon them, there always corresponds to it a process of decline, of loss of caste, of elimination. This fate also threatens the entrepreneur whose powers are declining, or his heirs who have inherited his wealth without his ability" (Schumpeter 1934: 155n).

In capitalism, therefore, the specific modes of conditioning and selecting economic agents are closely interwoven. In the case of the rise and decline of business entrepreneurs and their families, it follows that individual ability and social mobility will coincide due to the competitive aspects of the development process (Schumpeter 1942: 74). Accordingly, Schumpeter argued that the rise and decline of entrepreneurs and entrepreneurial dynasties in the social structure of modern capitalism contributed to its inherent dynamism, as expressed by the cyclical renewal of its elites. In this context, the family was portrayed as a social institution, rooted in non-capitalist sentiment and with no particular role to play in the evolving egalitarian order of a socialist system, hence it would become subject to institutional depreciation and structural decomposition already in the course of capitalist development (Schumpeter 1942: 156n).[154]

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[152] Thus the profit incentive does not represent the ultimate cause for entrepreneurial activity (Santarelli and Pesciarelli 1990: 685).

[153] Samuelson criticised Schumpeter's notion of the circular flow for the fact that the structural features of that model would not depict diverse generations, but only immortal clans as perpetual-life agents with indifferent subjective time-preferences (Samuelson 1981: 22n). This implies that the dynastic motive in stimulating investment and savings does not matter in the circular flow. In the context of legitimate simplifications, this is what Schumpeter attempted to illustrate.

[154] The erosion of family values would inevitably lead to the downfall of another institutional niche of pre-capitalist values, that is, as Schumpeter suggested later on, "the heroism of *navigare necesse est, vivere non necesse est*", promoting the adoption of short-run philosophies and anti-saving attitudes (Schumpeter 1942: 160n). This argument underlines most clearly the constitutive role of non-capitalist

This reference to non-capitalist value schemes pointed to further entrepreneurial motives that were neither to be traced in hedonistic choices nor in rational calculation. These motives involved an impulse for conquering and fighting, reflecting the striving for success as an ultimate cause, as well as an artistic joy of creating, that should reflect the expression of creative energy (Schumpeter 1926a: 138n). These facets should complete the picture of entrepreneurial motivation, meant to underline the position that Schumpeter's entrepreneurs are driven by motivations which are basically alien to the capitalist rationale, despite rational organisation in the carrying out of innovation.[155] While executing the entrepreneurial function, they remain strangers in the value setting of capitalism, for, they seem to follow an aristocratic ensemble of motives, rooted in the atavistic sentiment of pre-capitalist habits and values (Schumpeter 1942: 156n). Accordingly, capitalist development is in need of these non-capitalist components in the carrying out of the entrepreneurial function; a position which explains Schumpeter's rather provocative claim that capitalism may be perceived as the latest stage of a decomposing feudalism (Schumpeter 1942: 139).[156]

However, concerning an interpretation of these arguments, this raises the question, whether Schumpeterian entrepreneurship is really an endogenous force of capitalist development. It seems that the intrinsic motivation of the entrepreneur in Schumpeter's approach is actually exogenous to the economic process, contrasting with Schumpeter's attempt to cope with endogenous change (Tichy 1985: 13). Entrepreneurship would thus represent an ultimate factor of change which is left unexplained by the underlying mechanism of the economic system, as modelled within the confines of theoretical requirements (Shionoya 1997: 170). Apart from the analytical implications for Schumpeter's theory at large, for instance, the more specific question may arise, how to deal with entrepreneurial failure as an economic phenomenon.[157] Nonetheless, the institutional side of that argument is in need of further specification, for the matter of endogenous or exogenous motives in Schumpeter's theory has to be resolved by invoking the problems of institutional variety.

First of all, according to Schumpeter, entrepreneurship contains non-economic aspects, in terms of a specific sociological content, basically pointing to the matter of

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values for the dynamism of capitalist development. Moreover, it highlights the promotion of Weberian disenchantment, for entrepreneurship as a driving force of the development process also affects those institutional patterns, in this case the family orientation, that uphold its own existence (Osterhammel 1987b: 115).

[155] Accordingly, it has been proposed that Schumpeter put the conceptual emphasis of his theory on the irrational side of entrepreneurship. The Schumpeterian entrepreneur would exercise "rational conduct without a rational motive", for his expectations are of an irrational kind, while he rationally exploits opportunities for innovation (Elster 1983: 120).

[156] Indeed, the motives of pioneering entrepreneurs in Schumpeter's theory seem to resemble aristocratic values, rooted in feudalism (Rothschild 1986: 192). This assessment is well designed to counter a recent interpretation of the motivation of the Schumpeterian entrepreneur in terms of a simple reflection of individual leadership in confronting group behaviour (Casson 1995: 132n).

[157] Apart from the institutional dimension, this problem applies also to specific arguments with a biologist flavour. Indeed, it has been suggested that Schumpeter's entrepreneurial type echoes a biological determinism regarding the genetic quality of the "human material" (Matis 1993: 116n). This criticism seems to be in accordance with an interpretation of the biologist features of Schumpeter's arguments in terms of nurtured entrepreneurship (Hutter 1993: 189). Indeed, paying tribute to contemporary views on genetic determination, Schumpeter briefly hinted at his belief that entrepreneurial capabilities could be compared with vocal talent, significant for circa 25 percent of an ethnically homogenous population, yet distributed with differing individual intensities (Schumpeter 1926a: 120). Moreover, he claimed the social mobility as an effect of market competition would explain why the bourgeoisie harboured "human material of supernormal quality" (Schumpeter 1942: 204).

leadership.[158] Given Schumpeter's viewpoint on the economy as a whole, then, this position does not allow for a strict demarcation of economic endogeneity as far as the development process is concerned. In addition to that, institutional variety in capitalist development implies that entrepreneurship is shaped by pre-capitalist sentiments that are nonetheless indispensable for the economic process, as they inform the profit motive in market competition, perceived as an endogenous component. However, these sentiments become endogenous to the economic process in the course of capitalist development with its persisting rationalisation. It follows that a more appropriate representation of the problem of endogeneity in Schumpeter's approach would point to a Sombartian discrepancy between an entrepreneurial heroism and a bourgeois rationalism, underlying the process of rationalisation.[159]

It is noteworthy that these arguments on atavistic values belonged to the core of the Schumpeterian research agenda, pinpointing institutional variety as a condition of evolutionary change, as they were also applied to other theoretical aspects of economic development. Concerning market competition, for instance, Schumpeter suggested that industrial concentration and trustification was not primarily rooted in an economic rationale of efficiency, but resulted from instinctive rivalry, rooted in "nationalist, militarist, imperialist instincts of struggle" (Schumpeter 1920/1921: 313).[160] Moreover, the modern territorial state, approached as a "tax state", was analysed as a historical product of the princely fiscal crisis, related with military expenditures, which induced the evolution of the modern state as an organisation for raising taxes. As it mirrored an alliance of an expansionist aristocracy and a rational bureaucracy, hence, the spirit of patrimonialism would prevail within its administration (Schumpeter 1918/1953: 6n). An implication of that position was the rejection of any "ideological theory of the state that raises the latter into a superhuman agency for the public good", also meant as a demarcation from Keynesian policy ideals (Schumpeter 1954: 37).

Schumpeter used that type of argument also as an explanation for the phenomenon of imperialism. He maintained that imperialism was neither an outcome of economic interests, including class interests in Marxian terms, nor a structural feature of modern capitalism, but the manifestation of atavistic motives like "expansion for the sake of expanding, struggle for the sake of struggling, win for the sake of winning, rule for the sake of ruling", proceeding under the leitmotif "*plus ultra*", thus informing the definition: "Imperialism is the objectless disposition of a state to violent expansion without given limits" (Schumpeter 1918-19: 3n, translation by author). Aggressive nationalism and national rivalry were thus said to be rooted in instincts of dominance and warfare, while imperialism should be understood as a historical atavism, a persisting element of pre-capitalist institutional patterns. This argument paralleled earlier proposals on the character of entrepreneurial motives, as Schumpeter himself noted with regard to the non-hedonistic behaviour of the "captains of industry" (Schumpeter 1918-19: 21).

However, the evolution of modern capitalism should imply a reduction of imperialist leanings, reflecting an inherently pacifist rationale of capitalism; just like instinctive modes of behaviour were gradually replaced by the pattern of rational calculation that

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[158] This is also reflected by Schumpeter's assertion that entrepreneurial leadership resembled essential elements of the social world of businessmen that were still extraneous to it (Schumpeter 1941/1991: 344).

[159] In this context, bourgeois rationality would tend to impede a heroic type of entrepreneurship, meant as an exogenous factor, thus interpreting endogenisation as a professional implementation of the entrepreneurial function (Shionoya 1997: 253n).

[160] This was perhaps the point, at which Schumpeter's arguments came closest to Veblenian ideas which he usually despised for a lack of theoretical sincerity.

contributed to the erosion of personal entrepreneurship. Conflicts between free-trade regimes and neo-mercantilist policies then denoted existing varieties of capitalist performance, namely mercantilism with its instinct of domination against free trade as an equivalent of peaceful and mutually beneficial exchange. Therefore, protectionism was not caused by the capitalist process, but rather grounded in alliances of banks and industrial cartels, expressing an instinctive drive for economic expansion and domination (Schumpeter 1918-19: 119n).[161]

These motives of leadership, authority and power are also to be traced in the sphere of democratic parliamentary politics, perceived as a selection procedure of political leadership.[162] According to Schumpeter, democracy as a method for the selection of leaders implies competition for the vote of the electorate. This points again to an aristocratic element, for Schumpeter discussed political leadership capabilities as a charismatic feature of aristocracy, contrasting with bourgeois rationalism. Hence, quite in accordance with the thesis that a pure capitalism does not exist, and could not exist, Schumpeter dismissed the idea of a pure democracy that would be based on people's sovereignty in a parliamentary system (Schumpeter 1942: 137n).[163] Actually, this thesis shaped Schumpeter's policy conclusions on the situation of the Austro-Hungarian Empire during World War I, as he advocated a "tory democracy" to the benefit of conservative hegemony (Schumpeter 1916/1985: 271).

The insistence on the role of atavistic values in economic development hints at an underlying pattern of Schumpeter's thought which reflects the intellectual impact of *fin de siécle* philosophy, that is an expression of irrational thought, mirroring a contemporary crisis of beliefs in a rational automatism of economic as well as socio-cultural progress that had also affected Wieser, Weber and Sombart, among others. Schumpeter pointed to Nietzsche, Bergson and Sorel as the most prominent representatives of that strand of thought with its anti-rationalist stance and "anti-intellectualist" orientation (Schumpeter 1954: 774n). Indeed, the emphasis on irrational and instinctive acts of creation in a process of change was directed against rationalist philosophies with a Hegelian orientation, and thus it was also accessible for elitist and anti-democratic leanings. In essence, it shaped the fundamental values of Schumpeter's cultural pessimism.

In resuming motives of Dilthey's life philosophy, among others, Nietzsche exercised a major impact on Schumpeter's approach to entrepreneurial motivation, which echoed the "*Übermensch*" who would command superhuman will power in overcoming the "herd" routines of ordinary humans, yet also exhibiting a capability for artistic creation and playfulness. Bergson's vitalist philosophy seems to have influenced primarily Schumpeter's scheme of innovation in evolution, for its concept of "*evolution créatrice*" differentiated between inertia and creation as basic moments of an evolutionary process. Vital impulses of creation would be absorbed by the life process, resulting in monotonous repetition until another impulse would introduce novelty once

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[161] Schumpeter revised that theory subsequently, acknowledging that economic interests indeed played a role in the development of imperialism. He hinted at a retreat of his atavistic approach in favour of Renner's theory of "social imperialism", still rejecting orthodox Marxist explanations like Hilferding's, who was among Renner's comrades in the Austrian socialist party, while he explained imperialism in terms of capitalist trustification (Schumpeter 1939: 696).

[162] Thus, in Schumpeter's scheme, both the aspects of leadership and selection resembled the character of market competition (Brouwer 1996: 358n).

[163] Heilbroner proposed that for Marx the driving force of historical development was a dialectical process based on class struggle, with a decisive role for the working class, whereas Schumpeter also took account of social classes but delegated the decisive role to the upper strata of the aristocracy (Heilbroner 1981: 461).

more.[164] Schumpeter invoked related arguments especially in his early works, reflecting the contemporary intellectual context: "After some reflection one realises (...) that we actually *live* only in comparatively rare moments for real, usually still carry on 'mechanically' with the routine working day" (Schumpeter 1908: 568, translation by author, emphasis in original). Liveliness was thus meant to underline the temporary character of entrepreneurial activity, for creative acts of entrepreneurial leadership would only amount to brief periods, as potentials of creativity were running out of vital energy (Schumpeter 1912: 147).[165] In view of that, the notions of "creative destruction" and "creative response", designed as characteristics of evolutionary change, implied a vitalist mode of argumentation as well.[166]

Moreover, with reference to that intellectual atmosphere, another constitutive influence on Schumpeter's thought seems to have been exercised by Sorel's political philosophy, which introduced a "myth of violence", perceived as a revolutionary and creative force. Sorel indeed maintained that degeneration and decadence were seemingly natural facets of historical development, whereas the rise to cultural "greatness" needed to be enforced upon the masses. In this case, it seems that Sorel's impact on Schumpeter's ideas was most significant with regard to the disruptive nature of evolutionary change by entrepreneurial intervention (Sanatarelli and Pescialrelli 1990: 693). Accordingly, it has been suggested with reference to the underlying "myth of violence", that Schumpeter's use of the notion of "creative destruction" indicated at least a coquetry with Sorel's terminology (Andersen 1991a: 42). Still, in Schumpeter's thought, all these universal principles of evolutionary innovation were to be combined with historical dimensions that allowed for diverse styles of their actual manifestation. In particular, this implied a recognition of the historicity of entrepreneurship, reflecting the process of rationalisation in the specific phases of capitalist development.

6.4 THE HISTORICITY OF ENTREPRENEURSHIP

The notion of historicity applied to the matter of entrepreneurship shall reflect the suggestion that entrepreneurship, perceived as a type of economic action, is conditioned by a historically-specific institutional setting. Thus, according to Schumpeter, the entrepreneurial function of introducing novelty by means of leadership represents an universal principle which is historically conditioned in its actual realisation, as it is carried out by a variety of economic agents. For that reason, Schumpeterian entrepreneurship involved diverse institutional forms, reaffirming concepts that had been constitutive for the Historical School. In the terminology of the "Youngest"

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[164] This emphasis on creative acts was indeed prevalent both in Nietzsche and Bergson (Santarelli and Pescialrelli 1990: 689n). It has been pointed out, however, that Tarde preceded vitalist positions with his work on invention as the "motor of social evolution", emphasising the role of creative individuals by differentiating "inventors" and "repetitors" as types of human behaviour, based on instinct and intuition (Redlich 1964: 89n). Actually, Pareto's theory of elite circulation was also formulated with reference to Tarde's theses (Andersen 1991a: 30n).

[165] Regarding these arguments, it seems that Bergson's influence was also apparent in Schumpter's methodological statements on abstract schemes of theory that needed to be filled with life (Redlich 1964: 88n).

[166] These vitalist arguments remained constitutive for Schumpeter's theorising. For instance, Stolper has reported that Schumpeter referred to Bergsonian ideas when he privately commented on Marschak's criticism of "Business Cycles" which had pointed to a lack of formal theory, that enterprise would represent an internal "source of energy". Hence, economic development should not deal with "surface mechanical relations" but with an unpredictable evolutionary process that is not to be formalised (Stolper 1994: 375).

German Historical School, then, the historicity of entrepreneurship corresponds with specific economic styles which are again affected by entrepreneurial interventions. Schumpeter thus pictured the interdependence of institutional forms and entrepreneurial activity as "the 'shaping' influence of the former and the 'bursting' influence of the latter" (Schumpeter 1947a: 153). Hence, entrepreneurship is shaped by institutions, in terms of constraining as well as enabling functions, while it is also a driving force of institutional change.[167] Institutional change then imposed, furthermore, a reconsideration of the historical specificity of theoretical positions, in this case affecting the theory of entrepreneurship.

However, in opposition to Sombart's thesis of epochal changes in economic spirit, Schumpeter suggested that a distinction of development phases would not imply a change of the nature of economic activity, but only a change of socio-economic data. This position shaped the associated approach to the historicity of entrepreneurship. Thus Schumpeter claimed that it was not commercial motivation that made the 11th century merchant different from his modern counterpart, but the particular set of data that posed specific problems to solve (Schumpeter 1928a: 478). Accordingly, with respect to the diversity of historical types of entrepreneurs, Schumpeter accounted for social origin and sociological type, thus pointing to feudal lords, aristocratic landowners, civil servants, farmers, workmen, artisans and even members of the learned profession. Another possibility for approaching these distinct types was offered by using the entrepreneurial function and related attitudes as criteria. For instance, institutional qualities such as the setting up and organising of enterprises could be distinguished from mere leadership, all of them subject to historical specificity (Schumpeter 1947a: 153n).

Schumpeter's distinction of specific phases of capitalist development characterised the competitive period of capitalism in terms of a competitive behaviour of heroic entrepreneurs in family enterprises who participated in an evolutionary process, reorganising the productive organism in the direction of ever-increasing efficiency by the means of competing down unfit enterprises (Schumpeter 1928a: 478n). As the "liberal epoch" of competitive capitalism was dominated by competing family enterprises, the motivation of the corresponding entrepreneurial type of the "industrial bourgeois" exhibited a sense of duty as well as an unambiguous family-orientation (Schumpeter 1929: 308). This entrepreneurial type, also typified as a "merchant", was additionally portrayed as a socially responsible businessman, as a patriarch and master who tended to care for the enterprise in terms of a personal as well as a family concern, implying a rationale beyond pure calculation (Schumpeter 1928a: 484n).

Trustification during the neo-mercantilist phase then would lead to the dominance of large enterprises, as rapid technological progress would presuppose the large organisational unit (Schumpeter 1929: 316). Moreover, this developmental tendency would support industrial concentration, perceived not as an inherent component of market competition, but as an outcome of entrepreneurial behaviour, motivated by a drive for conquest and novelty (Schumpeter 1928a: 479). The corresponding entrepreneurial type of the corporate "captain of industry", endowed with professional habits and an authorisation by shareholders, would act unintentionally as the "pioneer of the planned economy" (Schumpeter 1928a: 484n). Visionary intuition that coined the

[167] It has been claimed that Schumpeter did not explore the sources of the entrepreneurial capabilities to innovate, which could be identified as inscriptions in the cultural profile of an economy, for he treated these institutional aspects as elements of the data set framing the economic process (Röpke 2001: 45). Accounting for Schumpeter's positions on the interplay of entrepreneurship and institutional order, however, this criticism does not hold.

commercialisation of technical inventions in the competitive period was replaced by the professional calculation of engineers and business statisticians, who would prepare the decision horizon of the "captains of industry". Schumpeter thus concluded: "(T)he business cycle loses its mysteries little by little, and curves and coefficients of correlation replace 'intuition' or 'sensitivity'" (Schumpeter 1929: 317).
Furthermore, in trustified capitalism, different types of entrepreneurs would be selected, for large organisations required an increasing role of leadership capabilities in coordination and cooperation. Selection procedures in the trustified economy would become less competitive and performance-oriented, yet more politicised in such a sense that compromise solutions between special interest groups would often determine the filling of leadership positions. This process would contribute to a separation of the success of enterprise and entrepreneur, for the latter finally would become a salaried employee (Schumpeter 1929: 318n). The major characteristics of Schumpeter's periodisation of modern capitalism with regard to these types of entrepreneurship are depicted in Figure 6.2.

Figure 6.2: Entrepreneurship in the phases of capitalist development

	Competitive Capitalism	**Trustified Capitalism**
Style of Kondratieff Cycle	*Bourgeois*	*Neomercantilist*
Type of Enterprise	*Family Enterprises*	*Corporations and Trusts*
Type of Entrepreneur	*Merchant*	*Corporate Director*
Mode of Innovation	*Individual Impulse*	*Organisational Routine*
Mode of Behaviour	*Intuitive Creativity*	*Professional Calculation*
Selection Mechanism	*Market Competition*	*Political Compromise*
Economic Return	*Entrepreneurial Profit*	*Employee Salary*

Given the recognition of these contextual aspects, shifts in Schumpeter's approach to innovation and entrepreneurship become accessible. Current discussions on Schumpeter's theorising tend to assess his approach as a dualistic concept of an early and a late Schumpeterian approach, shifting from a "Schumpeter I" model of personal entrepreneurship in newly founded enterprises with exogenous invention, as presented in "*Theorie*", to a "Schumpeter II" model of professionally organised science and technology by means of R&D in established large enterprises with an endogenous integration of invention and innovation in a model, as presented in "Capitalism, Socialism and Democracy". This alleged shift has been interpreted as a reaction to historical changes in the productive organisation of capitalist economies, pointing to the proposition that Schumpeter altered his basic argumentation on entrepreneurship and innovation (Freeman et al. 1982: 41n). Countering these positions, it has been suggested that a conceptual continuity in Schumpeter's argumentation is to be observed as soon as a historical perspective is taken into consideration, thus combining shifts in the characterisation of the carriers of the entrepreneurial function with explanations of the development pattern of modern capitalism as a process of rationalisation and bureaucratisation (Langlois 1998a: 57n).[168] Schumpeter's indication that corporate

[168] Moreover, it has been put forward that Schumpeter held an instrumental methodology, with historical experiences and theoretical insights settled on different levels. Thus changes of the empirical situation are

bureaucracies would come to replace personal entrepreneurship therefore represents not a reorientation of Schumpeter's thought, but a consistent approach to institutional change in industrial evolution (Langlois 1998a: 196n).[169]

A more precise assessment of Schumpeter's argumentation would have to address the variety of institutional forms that were conceptually essential in Schumpeterian entrepreneurship, as the corresponding analytical horizon had indeed widened beyond the heroism of personal entrepreneurship soon after the first edition of "*Theorie*". It is indeed a curious aspect in the evolution of Schumpeter's thought that he tended to relax rigid assumptions in his theory of economic development, allowing for an augmentation of its empirical content. In particular, the institutional foundations for Schumpeter's model of the development process, as put forward in "*Theorie*", referred specifically to the historical phase of competitive capitalism in the 19th century, when the typical carrier of the entrepreneurial function was said to be the entrepreneurial founder of a new enterprise who receives credit from the banking sector. However, Schumpeter claimed that this scheme had been established only because it represented the practically more important case, distinct from established enterprises that could turn to entrepreneurial activities at some point (Schumpeter 1926a: 216n). The concession that even established firms could exercise entrepreneurial functions indicated that the causal explanation of entrepreneurial profit, credit and interest, as well as the associated business cycle scheme, was open to further debate, including the analysis of entrepreneurship as an internal factor in the development process.

Still, even concerning competitive capitalism as a historical reference, Schumpeter had to admit that in many cases the identification of those agents who had actually carried out the entrepreneurial function, was difficult, due to the fact that entrepreneurship was carried out only temporarily and never in isolation (Schumpeter 1939: 103). In other words, the individual character of entrepreneurial leadership was said to be bounded by the complexity of economic action, for leadership was never purely embodied by single persons and thus needed to be identified analytically in a conglomerate of activities (Schumpeter 1928a: 482). Also the analysis of Schumpeter's standard example for an epochal cluster of innovation, namely railroadisation in the United States during the second Kondratieff cycle, indicated that the entrepreneurial function was often split between individuals. Schumpeter argued as follows:

> "The entrepreneurial function consisted, in this case, not so much in visualising possibilities – everyone saw them and speculated on them – or in the solution of technological problems – the locomotive functioned sufficiently well by that time and was thenceforth improved almost automatically by a series of typically 'induced' inventions, and no major problems impeded the building of the lines – as in the leadership of groups, in successfully dealing with politicians and local interests, in the solution of problems of management and of development in the regions the roads opened up. It was 'getting things done' and nothing else, a variety of pure entrepreneurship stripped of all accessories. But this entrepreneurship was often split between several individuals and is not always easy to attribute to any single one" (Schumpeter 1939: 327).

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said not to interfere epistemologically with the validity of the related theory (Frank 1998: 505n). Thus, a changing institutional manifestation of the entrepreneurial function in different historical settings would not affect the validity of Schumpeter's theory; a position that is in agreement with Schumpeter's emphasis on the historicity of entrepreneurship (Ebner 2003c).

[169] Even in Marshall's approach to the growth of firms and industries a similar shift of orientation has been noted. For example, Marshall's early position, that external economies benefit primarily industrial agglomerations of small enterprises, was extended to embrace the case of large enterprises (Prendergast 1992: 454n).

This perspective was taken up with regard to depersonalised entrepreneurship that would become prominent with the increasing organisational complexity in large enterprises:

> "Again the entrepreneurial function may be and often is filled co-operatively. With the development of the largest-scale corporations this has evidently become of major importance: aptitudes that no single individual combines can thus be built into a corporate personality; on the other hand, the constituent physical personalities must inevitably to some extent, and very often to a serious extent, interfere with each other. In many cases, therefore, it is difficult or even impossible to name an individual that acts as 'the entrepreneur' in a concern" (Schumpeter 1951: 256).[170]

The argument on the dissemination of the carriers of the entrepreneurial function within the complex organisation of large enterprises then paralleled the proposition that these large organisations would evolve as the most powerful "engine" of economic progress by combining organisational advantage in the productive use of large-scale technologies with the professional combination of invention and innovation (Schumpeter 1942: 106).[171] Specific types of innovation, especially their technological attributes regarding scale and complexity, would accordingly affect the institutional form of their entrepreneurial realisation. Despite the advantages in carrying out complex innovations, large enterprises were persistently challenged in a competitive process, as their basic technological and organisational improvements would wear out over time (Schumpeter 1939: 404).

Already in a pioneering elaboration on "the opportunities of socialism", Schumpeter had come forward with the diagnosis that technological progress would become automatised, with managed science dominating the sphere of invention, while the application of inventions in the innovation process would be established as a business routine (Schumpeter 1920/1921: 317n). In paraphrasing Weber, Schumpeter then put forward that, in the course of rationalisation, leadership functions were going to be carried out by specialised professionals representing the type of "professional man" (Schumpeter 1920/21: 318n). These arguments were basically reiterated in "Capitalism, Socialism, and Democracy", relating an obsolescence of the entrepreneurial function in its capitalist format with the thesis that employees in large corporations could act as entrepreneurs, for they would need to exhibit the entrepreneurial blend of charismatic leadership only temporarily in the context of professional routine tasks.

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[170] Nonetheless, Schumpeter commented on those approaches which replaced the notion of entrepreneurial action by the impact of organisations, milieus and the whole of society, that they would neglect those agents that drive the process of change (Schumpeter 1926a: 228n). This position does not contradict Schumpeter's additional assessment that "groups and classes are the real agents in the social process" (Schumpeter 1950/1991: 440). Collectives may indeed serve as institutional points of reference, however they are no substitute for individual action.

[171] Chandler's notion of managerial capitalism, with its consideration of the multidivisional organisation of large enterprises, seems to have been inspired by these Schumpeterian positions (Langlois 1998a: 195n). Indeed, the whole discipline of business history was influenced by Schumpeter and the German Historical School, as exemplified by the Harvard Research Center in Entrepreneurial History which had its programmatic roots in the Schmollerian research program (Redlich 1964: 11n). Chandler's definition of "industrial enterprise" was actually presented as a conceptual subspecies of Sombart's "capitalistic enterprise", that is, as an organisation that reaches beyond its individual members (Chandler 1962: 8). It was said to dominate not only economic affairs but also the domains of polity, military and religion, among others, understood in terms of a Weberian bureaucratisation in which private enterprises and public administration converge (Chandler 1962: 400).

Regarding the establishment of in-house R&D laboratories in large enterprises, the situation was summarised as follows, pinpointing the causal relationship between rationalisation and the demise of personal entrepreneurship:

> "Technological progress is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways. The romance of earlier commercial adventure is rapidly wearing away, because so many more things can be strictly calculated that had of old to be visualized in a flash of genius" (Schumpeter 1942: 132).

Innovation would become foreseeable as even consumers got accustomed to a type of predictable change which would lose its quality of spreading uncertainty. Hence, with innovation transformed to a mass phenomenon, coinciding with an emerging mass character of economic life that would be mirrored by a "democratisation" of the innovation process, the original leadership function of entrepreneurship in the institutional setting of capitalism would indeed become obsolete (Schumpeter 1942: 132n).

The matter of socialist transformation, implicit in these arguments, leads to Schumpeter's controversial thesis, that even government may carry out the entrepreneurial function. These government initiatives in the area of innovation, which could be singled out as entrepreneurial activities, would focus on stimulating the assimilation of innovative processes or products. The agrarian sector, then representing a standard case of traditionalism and innovation-aversion, was singled out as an example for that kind of collective action in the innovation process. Still, the generation of externalities by government intervention should be consistent with a primacy of entrepreneurship in private business firms:

> "Industrial evolution inspires collective action in order to force improvement in lethargic strata. Of this kind was, and is, Government action on the Continent for improving agricultural methods of peasants. This is not 'secondary' in the sense we mean it, but if it comes to creating external economies by non-economic influence, it has nevertheless been due so far mainly to some previous achievement in some private industry" (Schumpeter 1928b: 377).

Furthermore, the entrepreneurial function of teaching users and consumers the use of certain new processes and products, hence stimulating demand, could be exercised by government agencies. Again, Schumpeter illustrated this point of view by invoking agricultural policies in the United States:

> "Every social environment has its own ways of filling the entrepreneurial function. For instance, the practice of farmers in this country has been revolutionised again and again by the introduction of methods worked out in the Department of Agriculture and by the Department of Agriculture's success in teaching these methods. In this case then it was the Department of Agriculture that acted as an entrepreneur" (Schumpeter 1951: 255).

This perspective on government agencies as entrepreneurial agents was of course perceived as historically conditioned and context-specific. Historically, the case of cameralist strategies for economic development after the Thirty Years War in Germany provided an example for situations when the state carried out the entrepreneurial function before the emergence of competitive capitalism in the 19th century:

> "Was it not – again, in Germany – the state rather than the entrepreneur which initiated modern industry? The answer is (...) in the affirmative, and with the dosing appropriate to each case, similar answers would have to be returned for other countries. The German principality in many cases, ..., directly filled the entrepreneurial function, particularly in mining. Beyond that it conditioned

> enterprise by reshaping the institutional framework (legal reforms and so on) and improving the environment (canal and road building and the like), and by fostering it in various ways, some of which in fact come within what we usually understand by mercantilist policy" (Schumpeter 1939: 235).

Thus, statecraft was not to be understood as a distinct factor in the development process, but either as a particular kind of entrepreneurship or as a power in shaping the data (Schumpeter 1939: 235). In this sense, an articulation of the entrepreneurial function by organs of the state pointed primarily to an intervention in the economic process, basically by setting up public enterprises in certain industries, proceeding with the introduction of innovations. Moreover, an entrepreneurial conditioning of the economic process by means of restructuring institutional and physical infrastructures, among other possibilities, could accompany that type of entrepreneurial activity.

Although Schumpeter acknowledged the entrepreneurial intervention of governments as a historical variant, he remained sceptical on its sustained efficacy. For instance, the discussion of government involvement in railroadisation underlined problems of finance and investment under uncertainty. In this situation, as pointed out by Schumpeter, the planning and execution of innovations could be carried out rather successfully by state enterprises, like in the case of Russia, although the establishment of state enterprises in the early development of the railroad sector in the United States had proven to be a failure (Schumpeter 1939: 328). Basically, then, Schumpeter claimed that no government had been able to create sustainable economic structures that would not have evolved out of the market process in similar terms (Schumpeter 1918/1953: 371). Yet it remains noteworthy that Schumpeter's assessment of entrepreneurial interventions by government put an accent on the aspect of their sustainability. Recognition of the temporary character of entrepreneurship allowed for a more affirmative appraisal of entrepreneurial states, pinpointing the positive impact of a short-term engagement. Accordingly, an entrepreneurial conditioning of the economic process seemed to provide the most promising perspectives in the long run. Schumpeter emphasised that innovation was based on a distinct type of entrepreneurial behaviour that could be incited by a conducive institutional framework, also involving strategic activities of government in moulding that kind of entrepreneurial behaviour in the private sector of the economy (Schumpeter 1939: 86).

This differentiation between intervention and conditioning as policy devices was also applied to the analysis of industrial policies for import substitution, perceived as a negative factor under static welfare considerations but potentially positive as a dynamic force of prosperity in the development process. The case of German industrial policy towards achieving autarky from 1933 onwards provided a historical illustration, discussed in "Business Cycles". In this context, Schumpeter differentiated between "creative adaptation" and "passive adaptation" as a response to opportunities offered by import substitution. German industrial policy was portrayed as a case of conditioning innovation by offering investment opportunities beyond established patterns of industrial specialisation, hence allowing for entrepreneurial activities in new areas like synthetic rubber. This would represent a creative adaptation to changing economic conditions. Passive adaptation, in contrast to that, would be reflected by a mere expansion on the grounds of established patterns, for instance in wool production (Schumpeter 1939: 973).[172] On the role of government in that policy approach, Schumpeter then suggested:

[172] This argument matches the distinction between "creative response" and "adaptive response" that has been put forward in Schumpeter's succeeding presentations on entrepreneurship as a development factor.

> "By stating that the policy of autarky, as such, conditioned but did not more than condition a certain type of innovation, we do not mean that the government did not do more than that. It gave leads. It exerted pressure. It helped in various ways in financing and promoting. (...) And there were many cases of pure state enterprise. This active leadership was, of course, something very different from mere 'control' or 'regulation' and also from mere conditioning. But it must be distinguished from the policy of autarky as such" (Schumpeter 1939: 973).

Hence, the provision of financial resources as well as the establishment of state enterprises and government-related holdings in strategically important industries were assessed as components of an entrepreneurial function exercised by the state. Still, Schumpeter also remarked that a conditioning of entrepreneurial efforts would not imply that an absence of these policies corresponded with a lack of private sector entrepreneurship in the particular industry under consideration. Moreover, the possibility of arriving at damaging results needed to be taken into account, for instance due to the potentially distorting impact of policy measures that support certain industries while neglecting others. Therefore, the opportunity costs of industrial policy should be taken into account (Schumpeter 1939: 973n).

This qualified appreciation of industrial policy coincided with a primacy of market-orientation on the level of applied policy analysis and related recommendations. For instance, in the aftermath of the "Great Depression" Schumpeter stated that economic development as an evolutionary process would perform most effectively when running its course without regulative impediment (Schumpeter 1931/1985: 207n). Moreover, in the domain of competition policy, Schumpeter criticised the "sectional ideology" of anti-monopolistic arguments that followed an ideal of perfect competition.[173] Economic analysis would not legitimise "trust busting" in general, advising instead ad hoc inspections that should account for the performance of large-scale enterprises as well as for the social costs of destroying established structures (Schumpeter 1949a: 358). Still, the necessity of "restrictive practices" was acknowledged, pointing to patent systems that would allow for long-range investments in uncertain innovations due to their insurance and appropriability functions.[174]

Despite the commitment to market-oriented policy concepts, and in contrast to a theoretical concern with entrepreneurial profit, interest, capital and credit in the explanation of business cycles, based on institutions of private property and private enterprise, Schumpeter's policy argumentation allowed for the notion of an entrepreneurial state as a temporary phenomenon in capitalist development. As such, it belongs to the domain of economic sociology, constituting a specific subject in the institutional analysis of entrepreneurship. The corresponding differentiation between general function and specific carrier of entrepreneurship, to be perceived as the conceptual foundation of the notion of an entrepreneurial state, then underpins the historicity of entrepreneurship in Schumpeter's approach. Still, it also addresses the specificity of a theoretical framework that loses its explanative power beyond the institutional setting of capitalist market economies. Indeed, according to Schumpeter, an

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[173] This ideology of perfect competition was portrayed as follows: "(T)he ideology of a capitalist economy that would fill its social functions admirably by virtue of the magic wand of pure competition were it not for the monster of monopoly or oligopoly that casts a shadow on an otherwise bright scene" (Schumpeter 1949a: 357n).

[174] Schumpeter argued that these restrictions were among the institutional preconditions of sustained economic development: "(R)estrictions of this type are, in the conditions of the perennial gale, incidents, often unavoidable incidents, of a long-run process of expansion which they protect rather than impede. There is no more of paradox in this than there is in saying that motorcars are travelling faster than they otherwise would because they are provided with brakes" (Schumpeter 1942: 88).

administrative enforcement of innovation as the dominant type of entrepreneurship would already signal the socialist transformation of trustified capitalism. Capital, credit and interest would lose their function as levers of change during the transformation process. Innovation would result from administrative command, not mediated any more by monetary means. Thus government could carry out the entrepreneurial function in a socialist system quite logically by exercising economic leadership in the shape of socialist planning bodies (Schumpeter 1912: 173). This specific setting could be perceived as an outcome of rationalisation: "The principle of efficiency can assert itself much purer in the economy, when all the persons involved are merely calculating, instead of ruling, serving and being guided by other than purely economic considerations" (Schumpeter 1920/21: 319, translation by author).[175]
Regardless of that perspective of socialist transformation, which seemed to involve an almost complete decomposition of the institutional variety that constituted the foundations of modern capitalism, Schumpeter realistically envisaged specific transition states and mixed economic systems. Increasing government intervention and the retreat of private sector entrepreneurship could lead to the establishment of a "guided capitalism", characterised as "capitalism in the oxygen tent", which may include nationalisation programmes and could thus lead to "state capitalism" based on government ownership and management in industry, paralleled by regulated labour and capital markets (Schumpeter 1943: 125). Schumpeter thus claimed: "It follows that, public management or planning being never either absent or complete, our question concerning the immediate future should not be couched in terms of 'capitalism or socialism': there is a great variety of intermediate possibilities" (Schumpeter 1943: 114). Still, in order to underline the general historical tendency underlying the developmental process, these hybrid systems could be approached also as particular variants of an evolving socialist system (Schumpeter 1946a: 807).[176]
The Schumpeterian perspective on policy regulation and transformation was of course also meant as a response to the contemporary impact of Keynesian ideas on instability and stagnation of the economic process. This Keynesian position addressed the rationalisation of entrepreneurship, a fundamental topic in the Schumpeterian approach, in a manner that expressed a most sceptical attitude towards the institutional foundations of capitalist development, promoting a line of moral reasoning that resembled Schmollerian arguments. According to Keynes, then, capitalist economies are driven by an instinctive drive for the accumulation of monetary wealth, shaping the economic activity of entrepreneurs, including both producers and investors.[177] In the course of capitalist development, then, a speculative forecasting of the psychological dynamism of markets would come to dominate over enterprise, while economic instability would be fuelled by organised investment markets, allowing for excessive speculation and stimulating a disturbance of optimistic "animal spirits", meant as

[175] This position implied a fundamental disagreement with the contemporary criticism of socialist planning as a hindrance to efficiency considerations, as put forward by Mises. Indeed, it indicated a belief in the advent of socialism without sharing its goals (Osterhammel 1987b: 118).
[176] Variants of that perspective included arguments on a "managerial revolution", as put forward by Burnham, for Schumpeter claimed that bureaucratic organs of the war administration seemed to have prepared the ground for the rule of a managerial class (Schumpeter 1943: 122).
[177] Keynes thus suggested: "Many of the greatest economic evils of our time are the fruits of risk, uncertainty, and ignorance. It is because particular individuals, fortunate in situation or in abilities, are able to take advantage of uncertainty and ignorance, and also because for the same reason big business is often a lottery, that great inequalities of wealth come about; and these same factors are also the cause of the unemployment of labour, or the disappointment with of reasonable business expectations, and of the impairment of efficiency and production" (Keynes 1926: 291).

spontaneous urge to action that paralleled the rational calculation of entrepreneurial investors (Keynes 1936: 158n). This possibility of fading enterprise was also related with pioneering activities: "Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die" (Keynes 1936: 161n). Keynesian proposals for a regulation of the economic process then pointed to the public stimulation of effective demand that would include a "socialisation of investment" (Keynes 1936: 325n). In particular, corporatist bodies were taken to the fore as organisational solutions in a related type of "wisely managed" capitalism which seemed to be heralded by a developmental tendency of large enterprises socialising themselves in the process of trustification (Keynes 1926: 288n).

Despite certain parallels in the interpretation of entrepreneurial activity, contrasting Keynesian market psychology with Schumpeterian economic sociology, however, Schumpeter did not share these views, neither in positive nor in normative terms. Indeed, he used to address Keynesian thought as a variant of those ideologies that would almost unconsciously promote the advent of socialism. This constellation notwithstanding, a consensus seemed to persist in claiming that modern capitalism had reached a developmental phase that required specific institutional modes for promoting its economic dynamism.[178] Schumpeter, however, argued that the indeterminateness of technological innovation would remain a crucial factor in shaping the future course of capitalism, at least obstructing any tendencies for economic stagnation, as proposed even in advance of the "Great Depression" that was subsequently interpreted as a business cycle phenomenon, and not as an indicator of capitalist decline:

> "(T)he major shortcoming of any prophecy on the economic future of mankind is grounded in our ever more exact observation of the opportunities that are provided by presently used factors of production within known technology, but not of the technological opportunities themselves: While we may know how much land of what kind of productiveness is available, and while in this and any analogous sphere so far one needs to advance to ever more unfavourable production possibilities, still the field of technology is not to be seen at a glance, and it may deliver increasing as well as decreasing returns in the future – our epoch may appear to those who come after us as a climax of technological achievement as well as a point of departure hardly to be mentioned. Therefore the ghost, Keynes is amused to sketch, bears no scientific legitimisation. This is one side of the matter. The other is, that various circumstances, that is the automatisation of invention, first of all, argue *against* it that the – objectively possibly existing – interval of decreasing returns – in *that* sense, not in the sense of theoretical economics – will manifest itself soon, and that technology on its way may tear apart the relationship between famine and social will for design on the hand, and enforce a social order on the other hand, which may be called socialism or not according to matter of taste" (Schumpeter 1927c: 367, emphasis in original, translation by author).

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[178] As an antidote for the tendency of socialist transformation, Schumpeter, the Austrian conservative, expressed sympathy with the papal encyclica on social policy, "*Quadragesimo Anno*", which suggested that private initiative could be maintained by placing it in a corporatist framework, as opposed to extended regulations and government interventions (Schumpeter 1946b/1991: 400n). It is noteworthy that representatives of the Historical School held similar convictions. The notion of the social market economy, as formulated by Müller-Armack in Germany, belonged to that intellectual milieu. The Keynesian sympathy for corporatist principles, however, lacked from this religious dedication.

Looking back, it is safe to argue that economic development has taken a different direction than imagined by Schumpeter, although the Western European welfare states may have exhibited features that resembled his characterisation of a mixed economy approaching the socialist system. Yet it seems that Schumpeter, who never questioned the economic capacity for a survival of capitalism, underestimated its reproductive capacity on an institutional level, that is, its capacity for creative response, regaining a variety of institutional forms that included various carriers of the entrepreneurial function. The historicity of entrepreneurship seems to have promoted the persistence of capitalist development by renewing its institutional basis, reflecting attributes that were taken to the fore most prominently in Schumpeter's theorising. In this sense, the Schumpeterian perspective resumed its relevance, whereas Keynesian market regulation proved to be a failure at last. However, subsequent contributions to an analysis of entrepreneurship in economic development needed to deal with critical aspects of these Schumpeterian efforts as well. In transcending their inherent limitations, this meant that entrepreneurial functions needed to be conceptualised apart from a strict Schumpeterian setting of novelty and routine, specifically by emphasising the matter of entrepreneurial coordination in the development process. Despite Schumpeter's own attempt of widening the characterisation of entrepreneurial activities regarding the matter of coordination, echoed by the multifaceted characterisation of entrepreneurial ventures in "Business Cycles", still, in terms of systematic theorising, the underlying discussion points to the Austrian line of reasoning on the market process.

7 ENTREPRENEURSHIP, MARKET PROCESS AND EVOLUTION

7.1 COMPETITION AND THE DIVISION OF KNOWLEDGE

Schumpeter's approach has been assessed as an integral component of the Austrian tradition of economic thought stimulated by Menger, primarily due to the emphasis on uncertainty in economic change (Simpson 1983: 26n). Indeed, Schumpeter's thought evolved from the intellectual context of the second generation of Austrian economists like Böhm-Bawerk and Wieser, sharing fundamental arguments of the subsequently formulated Austrian critique of Keynesian theory and policy. Still, apart from the evident diversity of influences on Schumpeter's thought, it is the subjectivist orientation of modern Austrian theory in its Misesian or Hayekian interpretation that gets in the way of such a categorical inclusion of Schumpeter's theorising. This holds also for Knight's theory of entrepreneurship which was as well influenced by the Austrian School, highlighting knowledge and coordination as crucial factors in the cumulative process of economic development with its characteristic of substantial uncertainty.[179] Knight proposed that risk-taking entrepreneurs carried the responsibility for production, offering a guaranteed incomes within the organisation of enterprises (Knight 1921/1964: 244n).[180] Like Schumpeter's theory, Knight's approach ran parallel to the subjectivist mainstream of modern Austrian economics, yet contributing to an orientation towards evolutionary and institutional topics that should also become relevant for Austrian theorising.

The modern Austrian perspective in economic theory was established by Mises and Hayek in the context of controversial efforts in business cycle theory as well as in capital theory since the late 1930s (Kirzner 1999b: 19n). The commonly shared theoretical position of modern Austrian economics is based on the key categories of time and ignorance, pointing both to the role of novelty and uncertainty in the irreversible historical flow of events as well as to the subjective character of knowledge. Austrian subjectivist economics then deals with an unforeseeable process of coordination and discovery, shaped by institutional rules, while unintended consequences of individual action are perceived as constitutive factors of the economic process in terms of a spontaneous order (O'Driscoll and Rizzo 1985: 5n). Regarding the intellectual roots of that perspective, it has been suggested that Mises excelled as a founder of modern Austrian subjectivism, inspired by neo-Kantian and Weberian ideas in emphasising the proposition that the rationality of human action should be perceived

[179] Knight thus claimed: "Universal foreknowledge would leave no place for an 'entrepreneur'. His role is to improve knowledge, especially foresight, and bear the incidence of its limitations" (Knight 1921/1964: lix). The foundations of that approach were constituted by a distinction between measurable risk and unmeasurable uncertainty as the basis for an analysis of competition and profit. A refined perspective pointed to a differentiation of objective and subjective probability, denoting a known probability distribution in the case of risk, due to experience and past calculation, as distinct from uncertainty in dealing with unique events (Knight 1921/1964: 233).

[180] In his subsequent elaboration on the theory of the firm, Coase dismissed Knight's thesis of the risk-taking provision of guaranteed incomes as a distinguishing characteristic of firms (Coase 1937/1991: 21n). Still, it has been put forward that the Knightian scheme exhibits the conceptual advantage of addressing the opportunity costs of entrepreneurial ventures which may include the possibility of losses, and even the collapse of markets and firms (Kanbur 1980: 492n).

in terms of an assessment of ends and means (Lachmann 1976: 56n).[181] Austrian economics as a manifestation of hermeneutical thought in a subjectivist shape would accordingly focus on rational action, recognising the institutional specificity of economic phenomena (Lachmann 1990: 139). However, in accordance with Austrian principles, the relativism of historist thought was persistently confronted with an assumption of universal rationality.

Indeed, Mises designed the approach of "praxeology" as a specific perspective in economics, namely as the theory of human action that formulates the universally valid principles underlying human behaviour which were needed as a priori devices for categorising and explaining the objects of inquiry (Mises 1949: 32). Robbins's landmark definition characterised economics as a science that studies human behaviour as a relationship between a given hierarchy of ends and scarce means which have alternative uses. For Mises, however, a theory of choices regarding the allocation of scarce resources according to alternative ends-means frameworks should constitute the analytical focus. The corresponding aprioristic approach is concerned with economic laws in terms of the logic of choice and action, distinct from mere responses to external stimuli (Koslowski 1990: 6). Hence Mises suggested:

> "(E)conomics is not about things and tangible material objects; it is about men, their meanings and actions. Goods, commodities, and wealth and all other notions of conduct are not elements of nature; they are elements of human meaning and conduct" (Mises 1949: 92).

This position would imply a rejection of market equilibrium as a primary analytical device, emphasising instead the process character of economic activities:

> "Economics is not about goods and services, it is about the actions of living men. Its goal is not to dwell upon imaginary constructions such as equilibrium (...) The sole task of economics is analysis of the actions of men, is the analysis of processes" (Mises 1949: 354).

The notion of entrepreneurship then emerged as a major concern in that theoretical scheme. According to Mises, economic ideal types of entrepreneurs would denote a specific economic function, regardless of social, historical or geographical specificity, distinct from the historical ideal type of entrepreneurs that is not a general type but historically conditioned (Mises 1949: 61n). In the catallactic theory of human action, then, the corresponding concept of entrepreneurship was situated in spontaneous market processes. A point of departure was provided by the notion of the evenly rotating economy, resembling Schumpeter's circular flow, in which there no specific function for entrepreneurs were to be exercised, while economic agents would behave like mechanical devices, with no choices to make and no purpose to proceed with in "a world of soulless unthinking automatons" (Mises 1949: 249). Economic change set in as soon as choices were to be made.

According to Mises, entrepreneurship thus belongs to the core features of economic processes which are time-consuming and characterised by uncertain outcomes. Moreover, it is not confined to certain individuals or specific social groups, as Mises presented a concept of entrepreneurship that was attributable to all economic agents who would participate in the entrepreneurial equilibration of market constellations. Hence the claim: "In any real and living economy every actor is always an entrepreneur and speculator" (Mises 1949: 253n). In particular, entrepreneurship should imply activity in the face of uncertainty: "Entrepreneur means acting man in regard to the

[181] Such a broad interpretation that combines hermeneutical and subjectivist aspects only holds with regard to a wide-ranging interpretation of modern Austrian positions on human action as an expression of a universally valid rationality which may be distorted in its empirical manifestation (Oakley 1997: 237n).

changes occurring in the data of the market" (Mises 1949: 255). Accordingly, the market process was defined with respect to interacting economic agents: "The market process is the adjustment of the individual actions of the various members of the market society to the requirements of mutual cooperation" (Mises 1949: 259). While entrepreneurs would represent those economic agents who earn profits or suffer losses in the market process, profit should indicate a gain derived of action, that is, yield minus cost, perceived as an invariable aim sought by any action. Yet the pure entrepreneur, as modelled by Mises, is not an owner of capital, hence not a bearer of risk, for he merely receives loans from capitalists as risk-bearers.

This concept of entrepreneurship, is clearly distinguished from the notion of pioneering leadership, as represented by Wieser and Schumpeter. Mises reserved for the latter type of economic activity the term of the "promoter", defined as "the pushing and promoting pioneers of economic improvement" (Mises 1949: 255n). Hence, he suggested:

> "The phenomenon of leadership is no less real on the market than in any other branch of human activities. The driving force of the market, the element tending toward unceasing innovation and improvement, is provided by the restlessness of the promoter and his eagerness to make profits as large as possible" (Mises 1949: 256).

The differentiation between an active perception of market opportunities as an entrepreneurial venture and the matter of economic leadership as a kind of promotion function paralleled the distinction of entrepreneurship as a function that could be carried out by every economic agent as opposed to Schumpeterian entrepreneurship, which addressed only a minority of economic agents.

Additionally, Mises even argued that entrepreneurs would serve consumers, thus underlining another crucial difference with the Schumpeterian position:

> "The direction of all economic affairs is in the market society a task of the entrepreneurs. Theirs is the control of production. They are at the helm of and steer the ship. A superficial observer would believe that they are supreme. But they are not. They are bound to obey unconditionally the captain's order. The captain is the consumer" (Mises 1949: 270).

In Schumpeter's theory, of course, the "captain" is the entrepreneur, acting as the educator of habitual consumers in their assimilation of innovation. Accordingly, Schumpeter's concept of the historicity of entrepreneurship, even allowing for governments as carriers of entrepreneurial leadership, contrasted with Mises's focus on individual agents in the market process.

This leads to differences regarding the perception of rationality. In contrast to Schumpeter, who maintained that irrational modes of behaviour would prevail, Mises concept of the "*homo agens*" sensed rational behaviour as a universally valid pattern, based on a methodology of apriorism, that should also draw on Weberian ideas concerning an ideal typical approach to rational behaviour.[182] In this context, however, Mises refuted the conceptual foundations of debates on the evolution of capitalism which had been promoted within the German Historical School. Sombart's contributions, in particular, were interpreted as a variant of Marxist anti-capitalism and anti-liberalism, based on a fundamental suspicion concerning the individualist

[182] However, Lachmann has claimed that Mises also addressed the Bergsonian philosophy of vitalism with its emphasis on the dynamising role of human action (Lachmann 1976: 58). This would constitute some common ground with the Schumpeterian use of vitalist concepts.

principles of rationalism and efficiency in the development mechanism of market economies (Mises 1925: 289).[183]

The latter problems were also part of the research agenda pursued by Hayek, who paralleled Mises' efforts in elaborating on a theory of spontaneous order. Like Mises, Hayek took his analytical point of departure with explorations on the decentralised coordination of individual economic plans by proceeding with research in business cycle analysis.[184] These initial efforts in business cycle theory highlighted exogenously generated disturbances of the economic process, as banks would erroneously reduce monetary rates of interest below the corresponding natural rates, fuelling investment decisions which are not in accordance with prevailing time preferences, and thus contributing to disequilibrium in the economy. In this context, subjective knowledge and market coordination seemed to constitute the basic analytical challenges. In particular, Hayek argued that the division of knowledge, fashioned in analogy with the division of labour, would bring about the problem of coordinating fragmented knowledge no central authority can posses on its own (Hayek 1937: 49). While emphasising the subjective character of knowledge in economic coordination, Hayek's use of the category of knowledge should involve both scientific knowledge as a universal type and the knowledge of particular circumstances, conditioned by time and space, which is thus not to be quantified and measured statistically. The subjective acquisition of knowledge in learning processes then shifts established traditions and routines.[185] Accordingly, the problem of economic coordination would transcend the static limitations of Robbins' influential formulation on allocation as the constitutive economic problem:

> "The economic problem of society is thus not merely a problem of how to allocate "given" resources – if "given" is taken to mean given to a single mind which deliberately solves the problem set by these "data." It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality" (Hayek 1945: 519n).

Hayek characterised the price system as the most efficient mechanism for the decentral communication of information in an economic system that is characterised by a dispersion of subjective knowledge among the economic agents; an effect allegedly overlooked by approaches like Keynesianism that would remain conceptually fixed to the regulation of aggregates without accounting for the situation of individual agents (Hayek 1945: 523n). Again, contrasting with the Keynesian belief in a foreseeable stagnation of the economic process, Hayek maintained that the persistence of change as a crucial feature of market economies:

> "(E)conomic problems arise always and only in consequence of change. So long as things continue as before, or at least as they were expected to, there arise no new problems requiring a decision, no need to form a new plan. The belief that changes, or at least day-to-day adjustments, have become less important in

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[183] In response to these allegations, it has been claimed more recently, that the apriorism in Mises's portrayal of rational action within a universal means-ends framework belongs to a strand of theorising that promotes a hollowing-out of economic theory by dismissing its most indispensable historical and institutional content (Schefold 1994a: 232n).

[184] Despite their underlying common ground in the Austrian tradition, which is in itself marked by diverse theoretical positions, Hayek also dismissed certain fundamental issues of Mises's approach, primarily the apriorism in modelling subjective rationality as a basis of human action.

[185] This argument on the process of learning was meant to underline the subjective sources of institutional evolution in the Hayekian scheme of analysis (Garrouste 1994: 279).

> modern times implies the contention that economic problems also have become less important" (Hayek 1945: 523).

Hayek then applied these arguments to historical processes like industrialisation, which was attributed to market competition as a discovery procedure regarding material and human resources. This role of competition also seemed to be most important in cases of underdevelopment, for the particular discovery procedures in developing economies were still in their earliest stage, leaving habitually-oriented economic agents without experience from past competition as a device for future decisions (Hayek 1945: 188). Presenting an affirmative understanding of rationalisation as a development tendency, Hayek thus suggested:

> "During the whole of this modern period of European history the general direction of social development was one of freeing the individual from the ties which had bound him to the customary or prescribed ways in the pursuit of his ordinary activities. The conscious realization that the spontaneous and uncontrollable efforts of individuals were capable of producing a complex order of economic activities could come only after this development had made some progress" (Hayek 1944: 18n).

The evolution of knowledge since the Renaissance contributed decisively to that development process, based on individual economic initiative, which led to the establishment of modern capitalism, defined as "a competitive system based on free disposal over private property" (Hayek 1944: 77). Individualism reinforced the progress of scientific knowledge in the discovery procedure of market competition, thus contributing to the comparative success of capitalist economies:

> "Perhaps the greatest result of the unchaining of individual energies was the marvellous growth of science which followed the march of individual liberty from Italy to England and beyond. (...) Only since industrial freedom opened the path to the free use of knowledge, only since everything could be tried – if somebody could be found to back it at his own risk – and, it should be added, as often as not from outside the authorities officially intrusted with the cultivation of learning, has science made the great strides which in the last hundred and fifty years have changed the face of the world" (Hayek 1944: 19).

Socio-cultural evolution was thus linked to the division of knowledge. The growth of knowledge would actually imply a decrease of individual shares in the total complex of the division of knowledge, thus contributing to a relative deepening of subjective ignorance, while advancing the requirement for a coordination of decentralised knowledge. These coordination efforts should involve specific institutional forms of knowledge, like habits, rules and even technological aspects; all of them subject to an inherent variety of forms that shapes individual behaviour and choices:

> "The growth of knowledge and the growth of civilization are the same only if we interpret knowledge to include all the human adaptations to environment in which past experience has been incorporated. (...) Our habits and skills, our emotional attitudes, our tools, and our institutions – all are in this sense adaptations to past experience which have grown up by selective elimination of less suitable conduct. They are as much an indispensable foundation of successful action as is our conscious knowledge. Not all these non-rational factors underlying our action are always conducive to success. Some may be retained long after they have outlived their usefulness and even when they have become more an obstacle than a help. Nevertheless, we could not do without them: even the successful employment of our intellect rests on their constant use" (Hayek 1960: 26).

Innovations in institutional and technological terms, understood as basic elements in the evolution of knowledge, should be perceived as adaptations to changing data:

> "The undesigned novelties that constantly emerge in the process of adaptation will consist, first, of new arrangements or patterns in which the efforts of different individuals are coordinated and of new constellations in the use of resources, which will be in their nature as temporary as the particular conditions that have evoked them. There will be, second, modifications of tools and institutions adapted to the new circumstances (Hayek 1960: 32n).

Hence, cultural evolution according to Hayek would be based on a trial-and-error process which combines intentional and unintentional experiments in proceeding with institutional and technological innovations as an adaptation to changing socio-economic conditions (Vanberg 1992: 109). Hayek's evolutionary theory of institutional change then followed a rudimentary scheme of variety, transmission and selection. Underlining the aspect of evolutionary efficacy, Hayek suggested: "It is in the pursuit of man's aims of the moment that all the devices of civilization have to prove themselves; the ineffective will be discarded and the effective retained" (Hayek 1960: 36). The institutional structuration of particular groups would serve as the basis of knowledge transmission, while the selection mechanism also intervened on the group level, in accordance with capabilities for learning and innovation (Hayek 1960: 36). This evolutionary logic of institutional change, however, was not presented in terms of a detailed elaboration of evolutionary theory, despite the reference to Darwinian population thinking regarding transmission and selection. Indeed, it seems that Hayekian thought resembled most prominently a Mengerian evolution of organic institutions as well as Spencerian concepts of social evolution (Hodgson 1993: 186). Accordingly, the introduction of novelty was associated with a competition mechanism, promoted by an institutional framework which allows for variety in the discovery procedures in driving economic development (Hayek 1960: 37).

The subjectivist underpinnings of that position also informed the Hayekian critique of Walrasian equilibrium theory with its characterisation of market prices as carriers of objective knowledge. Attempts at modelling a socialist system of administrative planning by using Walrasian arguments were thus dismissed; a denunciation that included Schumpeter's thesis of the economic feasibility of socialism.[186] These essential arguments shaped further policy implications concerning a rejection of development planning and extensive public regulation, as modes of technological advance and the emergence of related social structures were not to be foreseen and controlled, neither in industrialised, nor in developing economies (Hayek 1978b: 188). Hayek claimed that development planning would imply attempts to regulate and shape economic processes in a scientifically founded manner, related with a predictive anticipation of future developments that was typical for constructivism, denoting a belief in the design and engineering of the institutional and social order of a society at large (Hayek 1978a: 3n).[187]

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[186] More precisely, Hayek reproached Schumpeter for an allegedly positivist position, supporting the possibility of socialist calculation, for Schumpeter treated the movement of relative prices as the reflection of objectively given quantities of goods, thus overlooking subjective moments in the evaluation of information that would be related to market prices as indicators of scarcity (Hayek 1945: 529n).

[187] The philosophical roots of these positions were associated with Cartesian beliefs in the construction of legal and social order, opposed to Scottish Enlightenment philosophy, as represented by Ferguson who claimed that a large part of social formations were a result of human action but not of human design, thus crossing conceptual boundaries between the naturally grown and the artificially designed (Hayek 1978a: 4n).

In contrast to these types of planning schemes, the relationship between competition, novelty, and entrepreneurship should be held responsible for the dynamism of economic development, based on the institutional framework of a particular economy. The delineation of a pioneering minority as a dynamising force that confronted a traditional majority then resembled the Schumpeterian argumentation:

> "This is that required changes in habits and customs will be brought about only if the few willing and able to experiment with new methods can make it necessary for the many to follow them, and at the same time to show them the way. The required discovery process will be impeded or prevented, if the many are able to keep the few to the traditional ways" (Hayek 1978b: 189).

Therefore, the implementation of an institutional order that is conducive to entrepreneurship, based on private property, would provide the most promising device for the formulation of development polices:

> "The much lamented absence of a spirit of enterprise in many of the new countries is not an unalterable characteristic of the individual inhabitants, but the consequence of restraints which existing customs and institutions place upon them. This is why it would be fatal in such societies for the collective will to be allowed to direct the efforts of individuals, instead of governmental power being confined to protecting individuals against the pressures of society" (Hayek 1978b: 189n).

Entrepreneurship in Hayekian terms actually mirrors the interaction of competition and cooperation in the division of knowledge which is rooted in the condition that every economic agent commands a specific advantage in his subjective knowledge. This thesis was exemplified by the entrepreneurial figure of an arbitrageur who gains from local price differentials, thus performing functions of adjustment and discovery (Hayek 1945: 521n). Hayek's notion of entrepreneurship then underlined the role of entrepreneurial discovery:

> "Yet there can be no doubt that the discovery of a better use of things or of one's own capacities is one of the greatest contributions that an individual can make in our society to the welfare of his fellows and that it is by providing the maximum opportunity for this that a free society can become so much prosperous than others. The successful use of this entrepreneurial capacity (and, in discovering the best use of our abilities, we are all entrepreneurs) is the most highly rewarded activity in a free society, while whoever leaves to others the task of finding some useful means of employing his capacities must be content with a smaller reward" (Hayek 1960: 81).

This type of entrepreneurship was presented as an institutional characteristic of market systems, involving "creative powers of a free civilization" that would parallel "spontaneous forces of growth" in terms of the decentral coordination of economic activities (Hayek 1960: 38). The notion of entrepreneurial discovery then supported the thesis of an essential unpredictability of economic development, paralleling the role of novelty in the course of scientific progress with its systematic as well as spontaneous characteristics.[188]

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[188] Hayek claimed on that relationship: "(M)ost scientists realize that we cannot plan the advance of knowledge, that in the voyage into the unknown – which is what research is – we are in great measure dependent on the vagaries of individual genius and of circumstance, and that scientific advance, like a new idea that will spring up in a single mind, will be the result of a combination of conceptions, habits, and circumstances brought to one person by society, the result as much of lucky accidents as of systematic efforts" (Hayek 1960: 33).

In spite of the unpredictability of evolutionary processes, Hayek's later works conceded at least the possibility of pattern prediction. In this context, the notion of organised complexity should denote a specific structure, characterised by the properties of its elements, the frequency of their occurrence, and the connection between them. Explaining and predicting these structures would mean, improbably, that full information about all elements were accessible. In the absence of these informations, at least pattern prediction would become possible as a prediction of the general attributes of structures without specific statements on their elements (Hayek 1978c: 26n). Therefore, an acknowledgement of entrepreneurial adjustments and discoveries in unpredictable processes could be combined with the identification of certain tendencies that would shape the pattern of development. Thus it should become possible to assess the course of complex processes without resorting to determinist explanations which are devoid of analytical means for grasping the developmental characteristics of these processes.
Indeed, the matter of predictability and determinism in economic development led Hayek to criticise the thesis of industrial concentration with its interpretation of the emergence of large enterprises as carriers of large-scale technologies in terms of an organisational shift towards central coordination beyond the market process. Again, at this point, a critique of Schumpeterian positions was at hand. Hayek claimed that decentral adjustments remained crucial in economic change, not at all losing in importance due to an increase of technological knowledge and a related extension of time intervals in investment decisions (Hayek 1945: 523). The economic relevance of innovation in Hayek's perspective was thus not confined to major technologies that could stimulate the evolution of whole industries. Rather it should denote all the results of discovery procedures that mark the essence of market competition, carried out by individual entrepreneurs on the corresponding markets. However, in the light of a comparison with Mises, it seems that Hayek neglected the comprehensive theoretical foundations of entrepreneurship, just like Mises allegedly underestimated the full theoretical impact of knowledge coordination (Kirzner 1999b: 22n). Indeed, further explorations of entrepreneurship in economic development from an Austrian perspective followed that line of reasoning with a distinct emphasis on the conceptual foundations of entrepreneurial market coordination, indicated by Kirzner's market process approach as a theoretical venture that proceeded most decidedly with attempts of utilising Schumpeterian ideas for its distinct analytical purposes.

7.2 ALERTNESS AND COORDINATION IN THE MARKET PROCESS

The analytical context of Kirzner's approach is situated in the domain of price theory, presented as a framework for understanding the interaction of individual decisions in a market process which is driven by spontaneous changes of prices, outputs, methods of production, and patterns of resource allocation (Kirzner 1973: 6n). With reference to Hayek's notion of markets as devices for knowledge coordination, Kirzner emphasises the notion of equilibration as error correction:

> "The perfection of knowledge which defines the state of equilibrium ensures complete coordination of individual plans. It follows that the movement from disequilibrium to equilibrium is at once a movement from imperfect knowledge to perfect knowledge and from uncoordination to coordination. We have seen that the movement from disequilibrium to equilibrium is nothing but the

> entrepreneurial-competitive process which is a process of communicating information" (Kirzner 1973: 218n).

This perspective on equilibration in the market process should constitute a "middle ground" between neoclassical equilibrium theory and those approaches that reject the notion of equilibrium altogether (Kirzner 1992: 3n).[189]

Kirzner's corresponding arguments on market equilibration rest on the concept of competitive discovery, addressing subjective learning which is related to the revision of individual plans:

> "The market process, then, is set in motion by the results of the initial market-ignorance of the participants. The process itself consists of the systematic plan changes generated by the flow of market information released by market participation – that is, by the testing of plans in the market" (Kirzner 1973: 10).

Despite a common concern with the role of knowledge and information in the institutional foundations of markets, this approach should differ from neoclassical theories of imperfect information, as put forward for instance by Stiglitz, due to a distinct use of the concept of knowledge. The notion of information asymmetry refers to costly information which is known to be available for market agents, whereas the Austrian perspective treats knowledge as a subjective matter, focusing on the discovery of already known as well as yet unknown knowledge segments; to be discovered most promisingly in an institutional setting of free markets (Kirzner 1997: 65).[190] Austrian subjectivism then provides the basis for Kirzner's concept of entrepreneurship, due to the subjective interpretation of economic signals, involving error and ignorance, which is at odds with the idea of an automatism in the adaptation of market activities to changing data (Kirzner 1994: 109n).[191]

Indeed, the Kirznerian type of entrepreneur constitutes the centre of Austrian market process theory, set in the tradition of Mises' notion of human action. At the outset, Kirzner introduces the type of the pure entrepreneur, fashioned in the context of a market constellation in which economic agents are unable to learn from past experiences with disequilibrium situations. In this market setting, the entrepreneur denotes a type of economic agent who perceives opportunities for entrepreneurial profit, derived from the realisation of arbitrage. An arbitrage concept that involves the matter of ignorance and learning thus provides the basis for Kirzner's theory of entrepreneurship. It is also used as a reference scheme for a more comprehensive view on the market process, in which the notion of pure entrepreneurs is dissolved in favour of the argument that every market participant is able to realise buying and selling opportunities (Kirzner 1973: 14n).[192] Accordingly, the exercise of entrepreneurship is

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[189] Indeed, even within the Austrian strand of economic theory, the status of equilibrium concepts has been the subject of controversies. Kirzner shares the position set up by Mises and Hayek, hence endorsing the thesis that markets exhibit an equilibrating tendency. Lachmann, however, excelled in contradicting this thesis of the effectiveness of intertemporally equilibrating forces by emphasising uncertainty as well as unknowability of the future (Garrison 1986: 88n).

[190] Stiglitz has outlined the basis of the "imperfect information paradigm" as follows. Individuals are rationally coping with costly information. They are imperfectly informed which implies that transactions may not occur which would have been realised in a state of perfect information. Institutional change is accordingly driven by the structure of information and transaction costs. All of this points at the incompleteness of markets, resulting in Pareto inefficiency all over the economy (Stiglitz 1986: 257n).

[191] Indeed, the Austrian entrepreneur performs equilibrating feedback functions which are similar to the Walrasian auctioneer, although the former dispenses from the centralist coordination structure of the Walrasian approach by contributing to the decentral coordination of the plans of economic agents in the market process, based on the dispersion of subjective knowledge (Schmidtchen 1990: 141).

[192] All of this boils down to Kirzner's general proposition: "we are *all* entrepreneurs" (Kirzner 1992: 27, emphasis in original).

neither attached to the condition of asset ownership, nor is it related with the capitalist role of providing capital:

> "The key point is that *pure* entrepreneurship is exercised only in the *absence* of an initially owned asset. Other market roles invariably involve a search for the best exchange opportunities for translating an initially owned asset into something more eagerly desired. The "pure" entrepreneur observes the opportunity to sell something at a price higher than that at which he can buy it. It follows that *anyone* is a potential entrepreneur, since the purely entrepreneurial role is presupposes no special initial good fortune in the form of valuable assets (Kirzner 1973: 16, emphasis in original).

Hence, factor ownership does not matter as a qualifying identity for entrepreneurial positions, as entrepreneurial activity may be independent from productive acts in terms of investment:

> "Pure entrepreneurial profit is the difference between two sets of prices (...) It comes from discovering sellers and buyers of something for which the latter will pay more than the former demand. The discovery of profit opportunity *means the discovery of something obtainable for nothing at all.* No investment at all is required" (Kirzner 1973: 48n, emphasis in original).

According to Kirzner, then, neoclassical theory is not fit to cope with these aspects, for the entrepreneurial element in the market process is not to be grasped by categories like efficiency and maximisation which are relevant only in the context of Robbins notion of economising in a given ends-means framework. Kirzner follows Mises in arguing that even the identification of ends and means belongs to the entrepreneurial function, as alertness toward the identification of economic goals and the discovery of resources in pursuing these goals constitute the decisive entrepreneurial capabilities (Kirzner 1973: 33n). However, pure entrepreneurs may be conceptually introduced to the market process model as a major simplification, allowing for an entrepreneurial agent who is confronted Robbins' maximisers. The decisions of these economising agents would be subject to error, as they deal passively with prices that were falsely perceived as signals of equilibrium. This would provide opportunities for interventions of the pure entrepreneur, who contributes to changes in prices, quantities and qualities of inputs and outputs (Kirzner 1973: 41n). Thus, entrepreneurship as an equilibrating force in market competition would remain crucial even in the absence of transaction costs, understood in Coase's terms as the costs of information, negotiation and inspection in preparing as well as carrying out contracts (Kirzner 1973: 225n).

The alert discovery of profit opportunities as a characteristic of entrepreneurial behaviour is linked with a specific type of knowledge:

> "(T)he kind of 'knowledge' required for entrepreneurship is 'knowing where to look for knowledge' rather than knowledge of substantive market information, The word which captures most closely this kind of 'knowledge' seems to be *alertness*. (...) Entrepreneurial knowledge may be described as the 'highest order of knowledge', the *ultimate* knowledge needed to harness available information already possessed (or capable of being discovered)" (Kirzner 1973: 68, emphasis in original).

This type of knowledge-based market coordination differs from the neoclassical standard treatment of knowledge, with its modelling of rational, well-calculated and deliberately conducted search procedures that are framed by specific cost-benefit arrangements, for entrepreneurial alertness includes both intended search as well as unintended discovery, including spontaneity (Kirzner 1979: 148n). Consequently, in the Austrian view, markets are perceived as stimulators of learning processes, yet often not

deliberately so, contributing to changes in the complex web of perceptions in which economic action is embedded (Kirzner 1979: 152n). Decision-making is accordingly linked to entrepreneurial alertness as the primary component of entrepreneurial activity (Kirzner 1985: 22). Therefore, the concept of alertness with its connotation of active modes of conduct should counter mechanistic and passive notions of economic behaviour: "It is this entrepreneurial element that is responsible for our understanding of human action as active, creative, and human rather than as passive, automatic, and mechanical" (Kirzner 1973: 35).[193]

This notion of entrepreneurship has decisive consequences for an assessment of economic growth and development. Kirzner points out that neoclassical growth theories in the Solow tradition consider technological change as the engine of per capita output growth in a steady state, yet model it only as a factor that is exogenous to the economic process. Thus they would fail in specifying the sources of economic growth, namely the entrepreneurial discovery of profit opportunities. In particular, the perception of a seemingly automatic mechanism of technological advance which is available all over the economy implies that new opportunities are to be realised instantly. Still, the mere expansion of technological knowledge as well as the related expansion of production possibilities do not imply an immediate realisation of these possibilities, for an awareness of such an expansion is related with the entrepreneurial role of exploiting previously unseen yet already existing opportunities. (Kirzner 1985: 74n). This neglect of discovery procedures and their institutional foundations in market processes corresponds with a policy orientation towards aggregate planning mechanisms (Kirzner 1985: 70n). An expansion of production possibilities that allows for new profit opportunities may indeed result from deliberate planning, for instance mirrored by an investment in human resources. Nonetheless, entrepreneurship is indispensable in the realisation of that growth potential, so a design of growth paths becomes impractical, for entrepreneurial discovery can not be planned systematically (Kirzner 1985: 78). Kirzner thus claims in Hayekian terms:

> "To plan is not to discover; in fact to plan presumes that the framework within which planning takes place is already fully discovered. In contrast, (...) the unfolding development of a nation's economy over time (i)s a process made up, to a major extent, of the interaction of innumerable individual acts of mutual discovery" (Kirzner 1985: 71n).

Therefore, according to that approach, the error-correction of economic agents is most effectively pursued by the decentral coordination of individual plans on markets without government intervention that would distort price signals and profit incentives (Kirzner 1997: 81n).[194]

This hint at the misconceptions of aggregate analysis, and the underlying Keynesian schemes of investigation, which are assessed in comparison with theorising on entrepreneurship, actually resembles Schumpeterian positions once again. Indeed, in addition to Mises, it is Schumpeter who is repeatedly mentioned as a major influence on market process theory. With regard to the role of entrepreneurship in economic change,

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[193] In this case, Kirzner's reference to Misesian arguments highlights once more a vitalist flavour in theorising on entrepreneurship, with an obvious resemblance concerning Schumpeterian positions, yet also paraphrasing Veblens institutionalist criticism of the neoclassical concept of economic man (Ebner 2003d).

[194] Nonetheless, the existence of individually differing degrees of entrepreneurial alertness is taken for granted, to be observed also collectively with regard to societies and groups, whose location in specific "climates" seems to make some of them keener to alertness than others (Kirzner 1985: 25).

conceptual parallels seem to prevail.[195] Indeed, it has been claimed that the Schumpeterian entrepreneur should be recognised as the same type of individual that is denoted by Kirzner's type (Kirzner 1973: 72). Furthermore, Schumpeter's distinction between ordinary economic agents and entrepreneurs is said to be reflected by the Kirznerian distinction between economisers, who act within given ends-means frameworks, and entrepreneurs, who discover profit opportunities, thus altering these ends-means frameworks. Also, the thesis of entrepreneurial alertness as the source of realised profit opportunities is said to parallel Schumpeter's notion of entrepreneurial profit through innovation, with both positions dismissing an explanation of profit as a specific type of income, as suggested by the neoclassical logic of factor compensation (Kirzner 1973: 79n).

Still, differences between Schumpeterian and Kirznerian theories of entrepreneurship persist, although they allow for an interpretation in terms of a complementary relationship. A first fundamental difference between Schumpterian and Kirznerian entrepreneurship lies in the equilibrating impact of the latter which is evidently distinct from the disequilibrating force of the former. The Schumpeterian entrepreneur is appropriately portrayed as a disturber of equilibrium who disrupts the established circular flow by initiating change and generating new business and profit opportunities. The Kirznerian entrepreneur, in contrast to that, denotes entrepreneurial initiatives towards equilibrating changes in a disequilibrium situation which is shaped by mistaken decisions and missed opportunities (Kirzner 1973: 72n).[196] The related criticism of Schumpeter's perspective then interprets Schumpeterian entrepreneurship as an exogenous force in the disruption of equilibrium, reflecting a theoretical framework which suggests that new equilibrium positions could be attained automatically, that is without further entrepreneurial intervention. Hence, it is postulated that the entrepreneur should not be viewed as a "source of innovative ideas *ex nihilo*", like allegedly in Schumpeter's case, but as an economic agent who is alert regarding already existing opportunities (Kirzner 1973: 73n). Hence, the emphasis on creativity and leadership which excels in Schumpeter's approach is replaced by the matter of discovery and knowledge, drawing on Mises and Hayek. Accordingly, Kirzner states that "the function of the entrepreneur consists not of *shifting* the curves of cost or of revenues which face him, but *of noticing that they have in fact shifted*" (Kirzner 1973: 81, emphasis in original).

Consequently, Kirzner has suggested that Schumpeter's approach is conceptually limited to cases where only major impulses matter, while the market process view of economic development also includes the indispensable elements of gradual change. Thus Schumpeterian economic development would constitute a special case of the market process (Kirzner 1973: 81). This characterisation of the market process perspective applies also to the role of entrepreneurship. Both innovation and imitation in Schumpeterian terms are perceived as activities of entrepreneurial agents who contribute to the squeezing of profit opportunities that arise in the context of above-equilibrium prices. Short-run movements as well as long-run developments are relevant in this context, as entrepreneurial innovators and imitators proceed with their equilibrating activities (Kirzner 1973: 81n). Equilibration then includes small adjustments and improvements regarding the supply of goods and services, also denoted

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[195] In terms of a negative reference, however, Kirzner also invoked Mises' criticism of static theory in Schumpeter's "*Wesen*", specifically the characterisation of static theory as a mechanistic concept which excludes a reflection of human action (Kirzner 1960: 69n).

[196] In this context, the perception of the circular flow as an even process is denounced as illusory, for it would actually cover disequilibrium constellations (Kirzner 1973: 127).

as incremental innovations, as well as price competition in general (Kirzner 1973: 128n).
Applied to the situation of less-developed economies, Kirzner even declares that the Schumpeterian notion of entrepreneurship, with its emphasis on disruptive innovations that add to the productive potential of an economy, would fail to address the phenomenon of underdevelopment appropriately. Instead, the Austrian position would provide more useful analytical devices by maintaining that entrepreneurship is meant to fulfil the already given development potential of an economy (Kirzner 1979: 115n). The profit incentive in market systems, constitutive for entrepreneurial activity, is accordingly perceived as an indispensable institutional device for the development process. Exercising entrepreneurship is only feasible in market economies, for their institutional setting allows for an entrepreneurial discovery of profit opportunities, whereas the absence of this mechanisms amounts to a key problem in systems of administrative planning (Kirzner 1979: 118n). An appropriate role of government from the Kirznerian point of view would thus reject state intervention in the development process, rather highlighting a concern with the establishment of an institutional order that encourages private sector entrepreneurship (Ioannides 1992: 68n).
However, in clarifying his position with reference to the concept of Schumpeterian entrepreneurship, Kirzner has recently come to acknowledge the psychological profile of real-world entrepreneurs, as drawn by Schumpeter, while confirming the impact of "creative destruction" as a characteristic of capitalist development. Moreover, the notion of an alert discovery of profit opportunities should include the aspect of Schumpeterian creativity. Still, in contrast to the Schumpeterian position, the entrepreneurial equilibration of markets remains valid as a theoretical device (Kirzner 1999a: 5n). In a modification of earlier arguments, Kirzner then suggests that his initial approach referred to markets for single commodities within a single time period, basically abstracting from production, while portraying the entrepreneur as an economic agent who notices profit opportunities in an alert but passive manner (Kirzner 1999a: 6n). However, arbitrage aspects remain elementary also in a multi-period constellation. Even in the case of an "intertemporal entrepreneurship", the decisive point is the perception of a price gap between present input and discounted future output. Hence, it is not the quality of entrepreneurial leadership, but the alertness it expresses, which needs to be explored (Kirzner 1999a: 11n).[197] Accordingly, in Kirzner's modified scheme, the discovery of pure profit opportunities may arise from pure arbitrage, intertemporal arbitrage, or innovative production. Pure arbitrage leads to the exploitation of opportunities for exchange, intertemporal arbitrage promotes an efficient intertemporal allocation of resources; whereas innovative production generates technological change (Kirzner 1990: 72).
The characterisation of the entrepreneurial role in the market process then requires a choice between innovation and coordination. Kirzner argues in favour of the latter, for he suggests that industrial change by innovation is to be interpreted as a correction of the misallocation of resources, representing the essence of entrepreneurial activity. Thus, both the discovery of already available knowledge as well as the discovery of new knowledge reflect a situation of incomplete coordination (Kirzner 1985: 158n). With regard to the introduction of the automobile as a major innovation resulting in the decline of horse-drawn carriages, Kirzner claims:

[197] The introduction of uncertainty within a multi-period framework would indeed allow for dealing with imagination, creativity and leadership, typical for Schumpeter's theory of innovation, at least in terms of psychological dispositions (Kirzner 1985: 63n).

> "Those entrepreneurs alertly *saw* better ways of using resources; their putting into effect the productive possibilities they saw was coordinative in the sense that it brought the pattern of resource allocation into a *higher* degree of coordination both with the true pattern of technological possibilities and the pattern of consumer preferences (...)" (Kirzner 1999a: 15).

The coordination aspect of entrepreneurship is derived from an optimal pattern of allocation, including technological possibilities, which is not recognised or discovered until entrepreneurs carry out a comprehensive restructuring of industrial activities (Kirzner 1999a: 15n).

While the topic of technological possibilities is really in accordance with Schumpeter's notion of invention as a precondition of innovation, still, Kirzner's related proposition of a "true" pattern of consumer preferences, which needs to be matched by innovations, contrasts most obviously with Schumpeterian positions. The latter argument addresses the matter of discontinuity and the role of leadership in shaping preferences. However, Kirzner concludes that the principle of alert entrepreneurship, referring to the need for coordination in the market process, provides more convincing insights than Schumpeterian ideas of breaking routines by disruptive innovations. Schumpeter's approach is said to take an outside view of capitalist economic development, driven by technological revolutions, while Kirzner's approach should provide an inside view, dealing with the discovery of profit opportunities, and thus also covering the case of technological innovations and the related creative qualities of Schumpeterian entrepreneurs (Kirzner 1999a: 16n).[198]

Still, Kirzner underlines the compatibility of these positions. He claims that entrepreneurship has been inadequately characterised either as an equilibrating or as a disequilibrating factor, whereas the Kirznerian view would integrate these views by modelling entrepreneurship as an equilibrating activity, yet without insisting on a realisation of equilibrium positions (Kirzner 1992: 6n). Entrepreneurial coordination then requires an economic setting that provides regularities beyond the apparently chaotic volatility of economic data. In this context, Kirzner points at the underlying variables of the market process, namely preferences, resource availability, and technological possibilities, that are to be distinguished from induced variables like prices, production methods, and output quantity as well as quality. The capability for an entrepreneurial equilibration of markets, that is the domain of induced variables, depends on the rate and volatility of unanticipated changes in these underlying variables. Persistently drastic changes, for instance in the technological domain, would overload the entrepreneurial potential for coordination, thus obstructing an increase in the orderliness of the market process (Kirzner 1990: 72n). However, in between the extremes of neglectable and extremely volatile data changes, their general unpredictability does not impede the emergence of economic regularities as a manifestation of equilibrating forces (Kirzner 1992: 5n). This is reflected by the notion of "bounded uncertainty", denoting a setting in which a certain course of action is imagined to be relatively more successful than others, thus giving directions for entrepreneurial alertness (Kirzner 1992: 25n).

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[198] This parallels an Austrian type of criticism which suggests that Schumpeter modelled the innovative introduction of new knowledge as an exogenous shock for the economic process (Berg and Brandt 1998: 244). However, the neglect of the subjective dimension of knowledge, which is indeed a shortcoming of the Schumpeterian perspective, does not allow for such a perception of innovation, for, according to Schumpeter, the entrepreneurial commercialisation of new knowledge implies an endogenous impulse for change.

In summary, it may be suggested that Schumpeterian entrepreneurship, dealing with drastic economic changes by means of innovative leadership, should be distinguished as a complementary perspective from Kirznerian entrepreneurship, dealing with gradual change by alert discovery in the coordination of the market process. Austrian market process theory thus exhibits a gradualist perception of economic change that is complemented by the Schumpeterian notion of discontinuous restructuring. Accordingly, bounded uncertainty characterises the activities of Kirznerian entrepreneurs, as it allows for economic coordination under conditions of reduced uncertainty in a structured institutional and technological framework. Schumpeterian entrepreneurs carry out innovations which revolutionise that framework, and thus they tend to generate uncertainty, while their leadership capabilities contribute to the establishment of a new pattern of routines and expectations that directs the economic process. The related aspects of innovation and coordination may be associated with current efforts in theorising on the institutional dimension of economic development. The domain of evolutionary economics excels in these efforts, resembling Schumpeterian and Austrian as well as historist and institutionalist ideas, yet positioning itself primarily as a neo-Schumpeterian strand of economic analysis.

7.3 EVOLUTION, COGNITION AND ENTREPRENEURIAL TYPES

Outlining the evolutionary perspective in economic theory from a general point of view, Boulding defined its subject matter as follows: "In its largest sense, evolutionary economics is simply an attempt to look at an economic system, whether of the whole world or of its parts, as a continuing process in space and time" (Boulding 1991: 9). In this case, the import of metaphors from biology should support attempts of establishing a perspective that is able to cope with the process-like character of production, innovation and economic development at large (Hodgson 1999: 76).[199] This general definition with its focus on the internal causes and consequences of economic change parallels a broad spectrum of ideas, involving the German Historical School as a major inspiration for subsequent institutionalist and evolutionary explorations in theorising on economic development (Ebner 2000a: 169n). Austrian theory also exhibits evolutionary features in its insistence on the indeterminacy of knowledge-based market processes, paralleled by evolutionary concepts of institutional change. However, the perspective of evolutionary economics provides more specific arguments, in particular allowing for a variety of institutional mechanisms for the creation and selection of novelty beyond market ensembles.[200]

From the perspective of evolutionary economics, economic development needs to be viewed as evolving in historical, irreversible time, perceived as a process which is caused by the generation and diffusion of innovation (Witt 1987: 9).[201] In order to

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[199] The impact of metaphorical schemes on economic theory may be exemplified with regard to mechanistic ideas underlying classical and neoclassical models, paralleled by evolutionary schemes that inform the arguments of related economic approaches, serving the heuristic purpose of ordering analytical positions (Hodgson 1999: 67).

[200] Three versions of market process theory have been distinguished by Littlechild, comparing the positions of neoclassical theory, the Austrian approach of Kirzner, and radical subjectivism in the tradition of Lachmann (Littlechild 1986: 28n). Yet it seems more appropriate to establish evolutionary approaches as the third alternative, with radical subjectivism as a crossing point to their terrain of argumentation.

[201] The compatibility of evolutionary and historical approaches to economic development has been emphasised by Heuss, stated with reference to Sombart's historical theory of modern capitalism as a

underline the differences between modern evolutionary economics, which allows for path-dependent change, and the Spencerian blend of evolutionary thought that had discredited earlier ventures in that particular direction, as stated by Schumpeter, the notion of economic evolution should not contain an unqualified notion of global optimality or linear progress (Nelson 1995: 57n). Evolutionary models in economics then comprise of learning and discovery processes, both allowing for error and imperfection, as well as a distinct selection mechanism (Dosi and Nelson 1994: 154n).[202] Still, in comparison with the formal sterility of the neoclassical theories of growth and development, the matter of creativity and novelty excels as a characteristic of the evolutionary position which is not to be analysed as readily in formal terms (Hesse 1990: 50n). This argument draws on Shackle's powerful thesis that novelty would be related to inspiration as the "birth of fundamentally unpredictable thoughts", leading to decisions that form creative acts (Shackle 1958: 23). In this sense, Shackle proposed that mathematical models were unfit to cope with novelty, the sphere of the imagined and the uncertain, for they would only reflect what is already given (Shackle 1972: 26n). At this point, then, the close relationship between Shackle's and Schumpeter's positions is most impressively illustrated, especially regarding the matter of creative imagination as an entrepreneurial act in processes of evolutionary change (Loasby 1984: 80).

Indeed, the impact of Schumpeterian ideas on the research agenda of modern evolutionary economics is most obvious, echoing a neo-Schumpeterian strand of theorising. The constituent features of such a neo-Schumpeterian position in economics, equivalent to the notion of an evolutionary approach, have been outlined by pointing at a common vision of economic evolution, expressed by a concern with institutional variety, technological innovation, and interdependent mechanisms of change and coordination (Dosi 1990: 337n).[203] In accordance with that, the causal relationship between evolution, innovation and entrepreneurship is summarised as follows:

> "Evolution can be defined here as the self-transformation of an observed system over time. Accordingly, economic evolution must be related to the capacity of an economy, or some part of it, to generate change from within. Mere adaptation to exogenously changed data (as change is usually interpreted in economic theory) is not everything. How is endogenous change produced? A sufficient condition – and, it is submitted here, a generic feature of evolution – is the creation of novelty within the system under concern which, after emerging, may disseminate (...). In the domain of economics, and in accordance with its action orientation, novelty is the outcome of human creativity and of the discovery of new possibilities for action" (Witt 1993: 2).

The endogenous character of economic evolution is accordingly derived from the behaviour of economic agents who take part in procedures of trial and error that drive the creation and dissemination of novelty (Witt 1994: 106). However, if the evolutionary process is divided into the segments of variation, transmission and selection, then the mechanism of enhancing variety by innovation needs to be clarified

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model of theorising on the evolution of economic systems. In this case, the historical uniqueness of evolutionary development paths is derived from the capability for innovation, understood in terms of entrepreneurial imagination and creativity (Heuss 1990: 92).

[202] More precisely, it has been claimed that evolutionary explanations of economic phenomena should include a mechanism of preservation and transmission, a mechanism of variety-creation, a mechanism of selection, as well as a mechanism of segregation between populations (Andersen 1994: 14n).

[203] Accordingly, the welfare-enhancing effects of evolutionary processes have been reconsidered in terms of a "Schumpeterian progress" which should denote a long run increase in per capita real income in all percentiles of the income distribution resulting from innovation (Witt 1996: 116).

more precisely with regard to the role of entrepreneurship and its institutional conditions.

Modern evolutionary biology usually refers to mutation or genetic drift as chance events. In contrast to that, an evolutionary perspective in economic theory may refer to consumer learning on the demand side, but even more prominent, and also uniquely related to the social sciences with its characteristics of purpose and intention, is a concept of motivation and action that pinpoints entrepreneurial activities.[204] Accordingly, an evolutionary approach would counter the conceptual framework of general equilibrium theory with its static underpinnings. Indeed, it is primarily the assumption of perfect competition which leaves no space for a concept of entrepreneurship that would involve novelty and uncertainty (Blaug 1986: 171). In particular, due to its reliance on the objectivity of the auctioneer as a centralised clearing agency, the coordination mechanism of Walrasian equilibrium theory seems to resemble a "Hobbesian central authority" rather than the institutional ensemble of a market system with its subjective and evolutionary features of decentral coordination (Hodgson 1994: 391n).[205]

Two distinct approaches to entrepreneurship in an evolutionary context may be distinguished. From the perspective of an individualist approach, the notion of entrepreneurship is presented as an individual type of behaviour. The source of novelty lies in the innovative behaviour of individuals which is rooted in a motivational inclination for coming up with novelty. Novelty then results from subjective thought and imagination, it is cognitively rooted in mental processes (Witt 1995: 83). Institutionalist and behaviourist alternatives to that position maintain that norms and routines as guiding principles for economic action need to be recognised. Thus, neoclassical and Austrian positions are criticised for modelling individuals, who are already endowed with certain preferences when they enter the economic process, whereas habits and other institutional aspects of economic behaviour should be perceived as the basis for interpreting information and hence for learning (Hodgson 1991a: 122n).[206] Based on behavioural aspects, the exploration then focuses on the search and satisficing schemes of firms which are considered the decisive organisational terrain of technological innovation, competition and economic change (Nelson and Winter 1982: 3n).[207]

The individualist position in evolutionary economics claims a necessity for elaborating on the behavioural foundations of theorising on innovation and evolution. Methodological individualism is thus considered indispensable, for innovations are discovered, implemented and adopted on the level of individuals (Witt 1987: 14n).

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[204] The original challenge of Darwin's evolutionary theory was the differentiation of genetic variety and divine creation, while evolutionary economics would focus on creative action and learning of entrepreneurs as well as consumers, thus reflecting the limited range in applying metaphors and analogies from evolutionary biology to economic processes (Schnabl 1990: 233n).

[205] Even from a post-Keynesian perspective, similar arguments have been pointed out. Kaldor referred to Walrasian general equilibrium theory as a blind alley in economic theorising that focussed attention on the allocative functions of markets, thus excluding their creative functions as an instrument for transmitting impulses to economic change (Kaldor 1972: 1240). Unfortunately, the role of entrepreneurship remains largely ignored in this effort to counter Walrasian equilibrium theory.

[206] From a Veblenian position, then, it is not individual entrepreneurship but rather the mechanism of cumulative causation which is treated as the engine of economic development (Hodgson 1991a: 126n).

[207] From this point of view, innovation and selection constitute the decisive interdependent facets of the evolutionary process: "When one looks at the economic problem from the perspective of evolutionary theory, economic progress depends on the quantity and quality of mutations (innovations) that are introduced to the system, and effectiveness of the processes that winnow the new departures, and spread those that are advantageous, and stamp out those that are not" (Nelson 1984: 648).

Accordingly, innovations are defined as the introduction of a set of opportunities for action, consisting of artefacts and strategies that have not been put to use before by individuals or groups of individuals in the context under consideration (Witt 1987: 18). Moreover, the entrepreneur is portrayed as an individual type of economic behaviour, based on an novelty-embracing individual attitude that is derived from genetic endowments as well as from individual acquisition by learning, embedded in a specific socio-economic context. Innovations then spring from the mental sphere, shaped by a cultural pool of information and knowledge (Witt 1987: 116n). This is in line with the postulate that an evolutionary economics should cope with novelty-embracing economic action in a general sense, hence overcoming the focus on special cases of entrepreneurial types (Witt 1987: 100).

Drawing on psychological approaches to economic behaviour, like those of McClelland's theory of achievement-driven entrepreneurship, it is claimed that individual attitudes towards innovation depend on novelty-embracing preferences, risk-bearing attitudes and an achievement-oriented drive for economic success.[208] Individual characteristics like competence and creativity then shape both the generation and diffusion of innovation. Therefore, entrepreneurial activity may be explored by subjectivist concepts in terms of an understanding of the meaningful action of individual agents (Witt 1987: 160n). All these individual factors are embedded in an institutional context that stands for a system of formal as well as informal incentives and sanctions. Regarding an endogenous change of that incentive system, it is suggested that societies which exhibit a novelty-averse orientation, like subsistence-oriented traditional agrarian societies, will develop novelty-embracing attitudes as a result of the emergence of a critical mass of entrepreneurial individuals, who promote an innovative type of behaviour (Witt 1987: 170n). With regard to the emergence of such a critical mass, the dissemination of knowledge and information becomes crucial, involving collective action; a process which becomes ever more difficult with the increasing complexity of industrialised economies (Witt 1994: 114). Consequently, even an individualist approach to evolutionary economics requires the use of supra-individual, institutional arguments (Witt 1995: 93).

Regarding the theoretical context of these propositions, Schumpeter's theory of entrepreneurship and innovation is appreciated as a pioneering approach in the individualist domain of evolutionary economics, in addition to the influence of the Austrian School (Witt 1987: 31). The corresponding interpretation of Schumpeterian entrepreneurship points at individuals who are endowed with a capability for initiative, foresight and leadership. It follows that the clustering of innovation, that is the key concept in Schumpeter's business cycle framework, is analytically derived from the presence of individuals with specific entrepreneurial qualities (Witt 1987: 37n). However, the positions of an individualist evolutionary economics also involve a critical assessment of Schumpeter's approach, concentrating on a lack of subjectivist insights in the emergence and diffusion of novelty. Schumpeterian entrepreneurship provides decisive arguments in that assessment, highlighting an alleged elitism that

[208] According to McClelland's psychological approach, motivation constitutes the decisive internal factor of economic growth, derived from an individual need for achievement that depends on values acquired during individual socialisation. As such, it is said to be an underlying aspect in the Weberian analysis of Protestant ethics in the rise of modern capitalism (McClelland 1963: 74n). Entrepreneurship, defined as the exercise of control over production combined with a risk-taking and novelty-embracing attitude, then articulates the achievement orientation of individuals independently from the prevailing economic systems (McClelland 1963: 84n). However, the neglect of the institutional specificity of economic incentives in capitalist economies has provided convincing arguments against this psychological theory of economic development.

would contribute to the neglect of incremental innovations and demand effects which seem to represent mass phenomena that are not qualified to fulfil a vital function in the Schumpeterian scheme (Witt 1987: 45). In conclusion, this assessment would imply that Schumpeter's approach lacks from a theory of the emergence of novelty; indeed a major shortcoming for an evolutionary approach (Witt 1992: 10n).

Again, this addresses the problem of subjective knowledge. Its neglect in Schumpeter's approach is said to correspond with the distinction of accessible exogenous inventions and endogenous innovations. In the Schumpeterian system, it seems that the meaning of new ideas is instantly and unambiguously revealed to the public. However, a reconsideration of knowledge problems reveals that economic agents suffer from a lack of experience with inventions. Hence, the subjective imagination of entrepreneurs is necessary to outline their possible commercial use as innovations. Moreover, due to the character of innovation as a trial and error process, unanticipated novelty may evolve even during the diffusion of innovation (Witt 1995: 85).[209] Yet even regarding the diffusion phase, Schumpeter's modelling of adaptive economic agents seems to remain unconvincing, as those agents who follow the pioneering entrepreneurs have to operate on disequilibrium markets, suffering from data volatility as a hindrance of calculation. Consequently, the institutional basis of competition in the whole innovation process needs further clarification (Witt 1987: 42n).

In defence of the Schumpeterian position, however, it may be claimed that these critical arguments fail to account appropriately for the concept of historicity, as well as for the aspect of rationalisation which reflects the historical differentiation of functions and carriers of entrepreneurship. In other words, this criticism does not account for the historical and institutional dimensions of Schumpeter's theorising which are still essential for an assessment of their analytical value. Furthermore, the individualist approach to evolutionary economics seems to follow Austrian market process theory in dealing principally with a gradual type of evolutionary change, thus contrasting with Schumpeterian saltationism and its focus on epochal innovations like the commercial introduction of railway systems with major spill over effects for a whole economy. In this scheme, pioneering entrepreneurs establish routines that serve as devices for those economic agents who follow the expansion of production possibilities, thus enabling economic calculation in competitive restructuring. This aspect of entrepreneurial leadership has been overlooked by critics from the evolutionary domain. Rather convincing is the additional argument that Schumpeter's theory does not explain the relationship between innovation clusters, their economic feedback, and the time pattern of business cycles (Witt 1987: 43n).[210] Most significant from an evolutionary point of view, however, is the argument that Schumpeter's thesis on the institutional decline of capitalism underestimated its developmental potential, reflected by the variety of institutional forms that remains an important source of innovation and economic change (Witt 1987: 51).

Austrian market process theory also exhibits specific advantages and deficits in relation to evolutionary positions. According to the individualist standpoint, a prime advantage seems to lie in the Austrian theory of entrepreneurship with its conceptual demystification and empirical secularisation of allegedly elitist components in Schumpeter's approach, as Kirzner adopts the Misesian concept of an entrepreneurial

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[209] Schumpeter's thesis that large enterprises would combine invention and innovation in the same organisational setting then seems to indicate a further modification of Schumpeter's ideas beyond the original business cycle scheme (Witt 1987: 41n).

[210] Nonetheless, it has been stated that the problem of cyclical regularity is only of secondary importance in an assessment of the evolutionary content of Schumpeter's theory (Nelson 1996: 92n).

potential to be observed in the activity every economic agent. This corresponds with a broadening of the notion of innovation, including incremental improvements and gradual change, as well as opportunities for price arbitrage (Witt 1987: 75). Yet also critical points have been identified. First of all, the decidedly non-empirical nature of Mises' apriorism, which is actually shared by Kirzner, means that the Austrian research program is not fit to provide individualist foundations of the market process in empirically valid terms. Moreover, related to these methodological problems, Kirzner is criticised for failing to give an uncompromising statement on the subjective mechanism that actually leads to the discovery of arbitrage opportunities. This means that market process theory neglects the analysis of novelty, an aspect which is of outstanding importance from an evolutionary perspective (Witt 1987: 73n).

Facing these problems, a synthesis of neo-Schumpeterian, Austrian and evolutionary approaches to entrepreneurship and innovation has been proposed by presenting diverse types of entrepreneurs who are settled in a distinct market structure, thus modifying Schumpeter's distinction of entrepreneur and ordinary economic agent. "Pioneering entrepreneurs", who set up new product markets, resemble the Schumpeterian type, while "spontaneously imitative entrepreneurs", as early participants in these new markets, would fit Schumpeter's notion of the secondary wave. Both of these entrepreneurial types are "initiative entrepreneurs" who are contrasted with "conservative entrepreneurs". These comprise of "responsive entrepreneurs", taking adaptive initiative only under major competitive pressure, and "immobile entrepreneurs", who are unfit to cope with innovation in general (Heuss 1965: 9n).[211]

The competitive evolution of the market process then corresponds with the phases of a product cycle scheme, commonly depicted by a S-shaped logistical diffusion curve. It relates entrepreneurial types, market structures and industrial output over time. The pioneering type dominates the phase of experimentation, in which innovations are commercially introduced, while both pioneers and imitators drive competition during the phase of expansion. In the phase of maturity, the type of the responsive entrepreneur enters the economic process, accompanied by an immobile type during the stagnation phase, when initiative entrepreneurs have already opted for market exit (Heuss 1965: 25n).

This market phase approach has sparked critical comments from the position of an individualist evolutionary approach. Apart from the methodological problems of delimiting market phases and partial markets, it is argued that the characterisation of distinct entrepreneurial types seems to overlook the effects of learning and competitive selection. Moreover, the demand side of the diffusion process remains out of the picture (Witt 1987: 67n). From a Schumpeterian point of view, furthermore, it would be necessary to discuss the particularly inappropriate use of the notion of entrepreneurship. Instead of a reconsideration of novelty and uncertainty, the market phases approach mirrors the diffusionist perspective of product cycle concepts.[212] Problems of diffusion,

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[211] This typology denotes personal characteristics which may shift during industrial evolution, as exemplified by the case of entrepreneurial pioneers who may develop an immobile orientation in the course of the development process (Heuss 1965: 11n).

[212] In this context, it is noteworthy that Rogers' landmark definition of diffusion proceeds as follows: "Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Communication is a process in which participants create and share information with one another in order to reach a mutual understanding" (Rogers 1995: 5n). The role of information resembles Austrian themes of knowledge coordination, yet in this case examined from a point of view which takes innovation basically as invariant during the diffusion process, hence allowing for new information on the object of diffusion but not necessarily for new innovation opportunities related to that object.

however, provide only a useful complement but not a substitute for theories of entrepreneurship. Related efforts have thus attempted to combine the notion of market phases with systemic aspects of the innovation process, proposing that the modelling of entrepreneurial types should mirror the subjective potential for creativity that shapes activities like adaptive problem-solving, arbitrage-oriented discovery, and creative innovation (Röpke 1977: 142n). The process of creative destruction then implies the emergence of new problems and potential solutions, based on the establishment of novel economic structures. An adaptation of economic agents within the embedding institutional framework then generates an ordered pattern of economic activity, leading to temporary stabilisation before innovation shakes up the economic system again (Röpke 1977: 43n).[213] In general, then, it seems that the moulding of entrepreneurial types according to specific market phases reduces the historical range of Schumpeter's approach to a tool of partial market analysis, hence it overlooks the rich institutional content of the Schumpeterian perspective.

This conceptual shortcoming applies also to other analytical ventures of individualist approaches in evolutionary economics. The firm, for instance, has been largely neglected as the crucial organisational terrain of innovation. In acknowledging that deficit, thus, the role of entrepreneurship in firms has been highlighted with regard to the matter of leadership and imagination. This means that entrepreneurship is perceived as cognitive leadership in the creation of a corporate culture, providing tacitly shared cognitive frames which are associated with the implementation of a business conception that promotes a certain strategic orientation (Witt 1999: 103n). Hence, within firms, entrepreneurial leadership implies coordinating individual motivation and dispersed knowledge, thus contributing to the Coasean advantages of firm organisations as compared with the governance mechanism of markets (Witt 2000: 744). This perception of entrepreneurship as cognitive leadership, while retaining Schumpeterian motives on the essence of entrepreneurial function in a modified form, still points to those strands of evolutionary economics that deal with the process of economic development from the perspective of a behavioural and evolutionary theory of the firm. In this case, the notion of entrepreneurship is conceptually transposed as an organisational capability which is rooted in specific institutional constellations governing firms in market competition. Beyond, the individualist position, then, the nexus between entrepreneurship and organisations is taken to the fore.

7.4 ROUTINES, CAPABILITIES AND THE FIRM

The evolutionary criticism of the neoclassical theory of the firm has commonly focused on its assumption of profit maximisation, reflecting a formal scheme of analysis that has been also made responsible for a neglect of entrepreneurship as a theoretical concern.[214] However, beyond that assumption of profit maximisation, attempts have been formulated to synthesise neoclassical and evolutionary perspectives by appealing to the

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[213] Concerning the institutional context of innovation, the notion of variety-enhancing mutation may be combined with changes in property rights, including norms and values that allow for specific regimes of appropriability regarding the returns to innovation (Röpke 1990: 112n).

[214] Actually, Baumol's verdict on the neglect of entrepreneurial behaviour in neoclassical theory addressed primarily the role of optimisation schemes: "For maximization and minimization have constituted the foundation of our theory, and as a result of this very fact the theory is deprived of the ability to provide an analysis of entrepreneurship" (Baumol 1968: 68).

selective efficiency of the market process.[215] Indeed, Alchian dispensed with the notion of profit maximising firms by invoking principles of biological evolution and natural selection. The economic system is perceived as an adoptive mechanism, while firms exhibit an adaptive, imitative behaviour of trial and error, striving for a realisation of positive profits, not for their actual maximisation (Alchian 1950: 211n). Entrepreneurship then becomes a subordinate aspect in the competitive process of selection and survival, in which firms with above-average cost structures are eliminated. An economic analysis of that process needs to account primarily for survival conditions as well as for the introduction of new combinations that become the subject of selection and adoption, whereas individual behaviour remains only of secondary relevance (Alchian 1950: 217). Alchian went on to propose that the counterparts of biological notions like genetic heredity, mutation, and natural selection in the economic domain were the notions of imitation, innovation, and positive profit. Innovation would become equivalent to the chance event of mutation. However, also imitation could lead to an unintended introduction of unique attributes, hence promoting specific forms of innovation as "unconscious pioneering and leadership" (Alchian 1950: 218n). Still, this argumentation leaves no conceptual space for an exploration of entrepreneurship as an economic force.

Even critics of Alchian's position, like Penrose, conceded that the concept of entrepreneurship was difficult to transfer in frameworks of formal economic analysis due to qualitative dimensions, like personal aspects of the involved economic agents (Penrose 1959: 33). In order to shed light on the internal mechanism of the growth of firms, Penrose defined entrepreneurship by means of the functional concept of entrepreneurial services, distinct from managerial services, yet relevant for the diverse areas of technology, organisation, location, and strategy. They were basically associated with knowledge and learning: "Entrepreneurial services are those contributions to the operations of a firm which relate to the introduction and acceptance on behalf of the firm of new ideas" (Penrose 1959: 31). Similar concerns have been expressed in Chandler's theory of the multidivisional firm, in which differences between entrepreneurial and managerial executives are based on the nature of their decisions. Managers fulfil their coordination function by proceeding with decisions in the framework of resources allocated to them, while entrepreneurs affect that allocation through their own decisions and actions (Chandler 1962: 11). Accordingly, "strategy" denotes the determination of long-run goals, while "structure" defines the administration of organisational forms that fit these strategic objectives. Chandler then claimed that structure would follow strategy. This implies a primacy of entrepreneurial decisions on "organisational innovations", thus reflecting the persisting role of entrepreneurial intervention in the evolution of organisational forms (Chandler 1962: 13n).

Yet this perspective involves a shift in orientation from an analysis of entrepreneurship as the carrying out of innovation and coordination in an economic system, to the problems of innovation and coordination within firms. The underlying thesis of the obsolescence of personal entrepreneurship points to the matter of organisational creativity and learning as major topics in the modern theory of organisation (Hagedoorn

[215] This position is related with Friedman's "as-if" hypothesis, which claims that theory needs to be judged by its predictive power, not by the realism of its assumptions. Applied to the theory of the firm, this implies that it does not matter whether firms really maximise returns, for evolutionary selection in market competition eliminates inefficient firms, so that all successfully competing firms can be treated as if they had been maximising their returns. Hence, strategies that are consciously pursued by economic agents in a firm would be analytically irrelevant (Hodgson 1988: 76n).

1994: 13n). Indeed, problems of organisation have been taken to the fore more extensively, quite in accordance with the observation that the emergence of innovation routines in large enterprises seems to underline the need for a theory of the firm rather than a theory of entrepreneurship (Bottomore 1992: 77). Most prominently, in this case, the behavioural approach to the theory of the firm emphasises the organisational dimension of economic activity. Both profit maximisation and perfect knowledge are identified as ill-conceived assumptions of the neoclassical theory of the firm, underlining the role of rationality. In contrast to that, satisficing and bounded rationality should emerge as alternative positions. According to Simon, bounded rationality means that any perception of information is bounded by the computational limitations of individuals. Informational complexity then demands a setting of decision rules and procedures which implies that economic agents engage in satisficing, instead of maximising, as they satisfy certain aspiration levels. In agreement with the organisational focus of analysis, entrepreneurship is said to be dispersed among diverse agents: "In a modern market society, economic decisions (...) are made not by individual entrepreneurs but by a complex of private and public institutions" (Cyert and March 1963: 4). Paralleling the behaviourist underpinnings of that perspective, the matter of innovation is associated with the organisational response to certain stimuli. When performance criteria remain unsatisfied, for instance in terms of market shares or rates of return on investment, organisational procedures change, and thus stimulate innovation processes. This means that innovation becomes institutionalised as an organisational response to changing market data that affect the competitive position of the firm (March and Simon 1958: 182n).

Based on these advances in the behavioural theory of the firm, a distinct evolutionary approach has been put forward by Nelson and Winter, pronouncing the organisational foundations of economic evolution. This approach aims at an behavioural-evolutionary theory of firms which operate in a market environment; a venture that shall lead to an analysis of economic change in evolutionary terms, including the behaviour of firms and industries in the course of competition and economic growth (Nelson and Winter 1982: 3). A decisive difference from individualist approaches lies in a separate perspective on the sources of change, for the analytical emphasis is not on individuals but on the analysis of larger systems, that is basically organisations (Nelson and Winter 1982: 51; 72). Evolutionary features of that theory, apart from a general concern with processes of change, are derived from the notion of an economic "natural selection" of firms during market competition, as well as from the perspective of an "organisational genetics" that copes with the transmission of organisational attributes over time (Nelson and Winter 1982: 9n). On methodological grounds, then, the idea of a predictive power of unrealistic assumptions like the neoclassical maximisation hypothesis is rejected in favour of assumptions that are close to historical and empirical evidence, although this might imply a less abstract and formal mode of analysis.[216]

In particular, it is argued that hypotheses on maximisation as a device of economic behaviour are not able to deal with uncertainty, innovation and institutional variety, thus misrepresenting technological change as an essential feature of capitalist development, key to its dynamism in generating profits as disequilibrium phenomena. Instead, it is claimed that neoclassical theory installs behavioural concepts which resemble "automaton maximizers" (Nelson and Winter 1982: 28n). Moreover, given the path-

[216] Indeed, it has been claimed that this evolutionary perspective with its focus on the organisational components of enterprise performance excels in its conceptual sensitivity to historical specificity and institutional variety, as compared with neoclassical and transaction cost types of theorising (Hodgson 1999: 248).

dependency of evolutionary processes, the optimisation of choice variables is essentially local and myopic, thus not approaching a global optimum as depicted in neoclassical models (Nelson 1995: 51). In rejecting the assumption of maximisation, including the assumption of a specified choice set, an alternative framework is presented as well. For that cause, the concept of routine is introduced, resembling the "genes" of a firm which transmit and define its opportunity space. As the sum total of norms and rules that govern the activities of firms, routines combine the skills of the personnel with the accumulated physical capital of the firm. Routines then constitute the heuristics that shape the identification and solution of problems in the economic process by moulding economic behaviour in organisations across the conceptual boundaries of capability and choice (Nelson and Winter 1982: 14n). Moreover, routines operate at different levels of persistence and change, forming a functional hierarchy. Some are concerned with operation characteristics, others with changes of the capital stock, while a third type shapes the search for changing operation characteristics. This scheme includes production routines as well as R&D strategies and related search procedures for innovation, yet also patterns of price setting in terms of mark-up rates that respond to demand fluctuations.

The modelling of routine-guided search procedures then focuses on the criterion of anticipated profit, perceived in the context of a feedback mechanism of search and selection (Nelson and Winter 1982: 16n). In particular, the notion of search shall designate the evaluation of current routines, resulting in persistence, modification or replacement. The impact of search activities that lead to a change of routines and related aspiration levels thus may be understood in terms of a stochastic generation of mutations (Nelson and Winter 1982: 135n).[217] Innovation then denotes principally a change in routines, affecting both technological and organisational dimensions of the economic process. It results both from chance events as well as from specific routines for problem-solving, representing conditions upon which the organisational capability for innovation rests as an unpredictable phenomenon (Nelson and Winter 1982: 128n). From that viewpoint, selection focuses not on distinct firms, but on routines, quite in accordance with the adopted population perspective. The selection environment of organisations is accordingly shaped by the behaviour of other firms in the industry under consideration, as well as by factors external to that industry. Moreover, both market and non-market selection environments influence the evolutionary process, allowing for a distinct role of the public sector and related policies (Nelson and Winter 1982: 266n). This institutional complexity is of course starkly reduced by the modelling of incentives for innovation, based on technological opportunity, market size, and the appropriability of returns, indicating prospects for the realisation of quasi-rents in the innovation process (Nelson 1984: 650).

In accordance with Gomulka's exposition of the simulation models that have been put forward by Nelson and Winter, their basic approach to a behavioural-evolutionary theory of innovation may be formalised as follows (Gomulka 1990: 72n). Assumed is an industry with a large number of firms, producing a homogenous good by using homogenous inputs of labour and capital in terms of fixed input coefficients a_L and a_K, describing a specific technology. Knowledge of technologies is locally bounded, hence

[217] In critical examination of the satisficing approach, it has been argued that the profit incentive in capitalist market economies does not allow for a steady reproduction of established satisficing schemes, as aspiration levels are consistently raised, driven by the rationale of market competition, and not by a mechanism of satisficing in organisations (Dunn 1998: 98). However, the behavioural-evolutionary approach tends to reflect the latter aspect in claiming an interdependence of competition, search and routines.

single firms are not completely informed about opportunities, whereas all firms together possibly are. The state of a firm j in a specific time period t is described by a triple of input coefficients and capital stock K_j. The assumption of a full utilisation of capital and labour implies full employment, regulated by labour supply as a function of the wage rate w. Aggregate capital stock K, output Y and employment L of an industry are thus defined in equations 7.1:

$$(7.1) \qquad K = \sum K_j \quad ; \quad Y = \sum \frac{K_j}{a_{K_j}} \quad ; \quad L = \sum \frac{a_{L_j}}{a_{K_j}} K_j$$

Moreover, the growth of the capital stock of a firm over time proceeds as follows. Net investment, equal to excess of net profits above a required dividend that reflects satisficing conditions, is added to positive capital of the current period. With depreciation rate δ and required dividend rate D, the investment process is accordingly described in equation 7.2, in which the joint influence of all firms within the industry on costs and profits of individual firms is expressed.

$$\begin{aligned} K_{j,t+1} - K_{j,t} &= pY_{jt} - w_t L_{jt} - \delta K_{jt} - DK_{jt} \\ &= p\frac{K_{jt}}{a_{K_j}} - w\frac{a_{L_j}}{a_{K_j}} K_{jt} - \delta K_{jt} - DK_{jt} \\ &= \left(\frac{p - wa_{L_j}}{a_{K_j}} - \delta - D \right)_t K_{jt} \end{aligned} \qquad (7.2)$$

Behavioural aspects of that modelling approach are based on the matter of local search. As presented in equation 7.3. The probability of finding a new technology h' is negatively related to its distance D from the technology h currently in use. This implies that gradual improvements bridging low technology distances will be the dominant pattern of technological change.

$$(7.3) \qquad p_s(h') = \alpha - \beta D(h, h')$$

The technology distance $D(h, h')$, as defined in equation in 7.4, is based on the actual value of the parameter π, allowing for a factor bias in search processes which is determined by the industrial environment. A value of π above 0,5, for instance, points at proportional difficulties in reducing the capital coefficient as distinct from reductions of the labour coefficient during the search for new technologies.

$$(7.4) \qquad D(h,h') = \pi \left| \log\left(\frac{a_K^h}{a_K^{h'}} \right) \right| + (1-\pi) \left| \log\left(\frac{a_L^h}{a_L^{h'}} \right) \right|$$

The case of imitation is formalised in equation 7.5, in which the probability for discovering technology h' is a function of the probability of finding a new technology

by local search and the probability of finding it by imitation, with λ expressing a behavioural bias.

$$p(h') = \lambda p_s(h') + (1-\lambda) p_{im}(h') \tag{7.5}$$

Moreover, the simulation approach suggests that the probability for imitation will be proportional to the share of output generated by firms that already use the new technology, whereas the criterion for its implementation within the firm is determined by its higher profitability as compared with the established setting.
The emphasis on organisational routines demands an assessment of knowledge as a distinct factor in economic change. Neoclassical theory is criticised for its usual treatment of knowledge in terms of a "book of blueprints". This concept of codified knowledge is mirrored by neoclassical models of innovation, in which R&D expenditures represent the purchase of knowledge as an input, augmenting other factors in the production process. Knowledge then resides either in technological manuals, that is in diverse "blueprints", or in the capabilities of "knowledge specialists" like engineers who carry out the function of technological experts. Both variants fail to account for the tacit dimension of knowledge, for it is partly non-codifiable, that is, it exhibits a subjective character, conditioned by a specific context which impedes transferability like a conventional public good. Its use in firms, however, is not necessarily fixed to specific individuals, but rather to the whole organisation (Nelson and Winter 1982: 60n).[218] Consequently, even the differentiation between innovation and imitation becomes blurred. Imitation involves independent problem-solving activity which is worthy to be denoted as an innovation. The impulse for novelty is of course of a lower intensity for imitators, who are already informed about general solutions, than for pioneers who face the original uncertainty of outcomes. Still, innovation is not to be calculated in terms of rational choice regarding production possibilities nor is it to be predicted. Creative problem-solving activity thus remains an uncertain and open-ended process (Nelson and Winter 1982: 123n).
The identification of major intellectual influences covers a broad range of economic ideas, involving Austrian market process theory and preceding attempts in evolutionary theorising. However, a well-established focus rests, firstly, on Schumpeter's approach, with its characterisation of innovation as the driving force of economic development, and, secondly, on Simon's behavioural approach to organisations, involving the concepts of bounded rationality and satisficing (Nelson and Winter 1982:ix). Indeed, Nelson and Winter claim the status of a "neo-Schumpeterian" orientation, as they would analyse "capitalism as an engine of progressive change", including the institutional components of boundedly rational economic behaviour (Nelson and Winter 1982: 39n). The latter aspect underlines the attempt of integrating Schumpeterian ideas with behaviourist concepts. This is indicated by the argument that Schumpeter presented a behavioural theory, as allegedly by the notion of the circular flow in which economic agents exhibit a routine-following behaviour, whereas innovation enforces a reorientation beyond established routines (Nelson 1984: 646n). The argumentation culminates in the proposition that Schumpeter's concept of economic behaviour may be set in relation with Simon's notion of bounded rationality, for both would reject the idea of an ubiquity of rational calculation and choice (Nelson 1996: 94).

[218] Moreover, the aspect of tacit knowledge and its reflection by individual skills implies an individual trade off between deliberate choice and skilful behaviour. This argument leads to the concept of organisational capabilities that become manifest in routines governing firms (Nelson and Winter 1982: 94n).

Nonetheless, an investigation of that argument would have to state that Schumpeter's approach to economic behaviour, in spite of particularly affirmative hints at behaviourism, well exceeds the latter's analytical confines with its insistence on a scheme of stimulus and response that need not account for the subjective meaning of action. Indeed, coping with a topic that was not of primary relevance for the Schumpeterian perspective, the behavioural-evolutionary analysis of routines and skills focuses on the organisational level of the firm. An in-depth discussion of entrepreneurship or even an exploration of the entrepreneurial function is not important for that position, which defines entrepreneurship only vaguely as the carrying out of innovation without a further specification of its institutional content (Nelson 1984: 646n).[219] Evidently, then, a deficient treatment of entrepreneurship in the behavioural-evolutionary approach needs to be taken to the fore, representing a decisive problem for an appreciation of the Schumpeterian content in its theoretical efforts.

While the notion of entrepreneurship is virtually absent, the concept of R&D, both as an intra-firm activity as well as a terrain for government strategies, takes centre stage in that approach.[220] Schumpeter's concern with the role of R&D and large-scale technologies is appreciated as a pioneering contribution to the evolutionary analysis of innovation in the setting of large enterprises, coping with monopolistic constellations that are contrasted with the static considerations of perfect competition. Still, beyond these theoretical reflections on the relationship between innovation and competition, Schumpeter's alleged neglect of conceptualising government involvement in the financial and organisational support of innovation has been pronounced; a point that hints at the policy orientation of evolutionary economics (Nelson 1984: 656). This policy aspect points also to the failure of Schumpeter's thesis of rationalisation, according to which innovation would become a predictable routine which is also attributable to socialist economies. Despite a crucial role of government in industrial innovation, actually no tendency of a "socialisation of R&D" has been observed. Instead, private enterprises, responding to profit incentives in market competition, remain the decisive agents in capitalist development. With regard to the decline of socialism, then, it is suggested that technological change remains subject to cultural evolution in capitalist economies, including search, experimentation and uncertainty, while bureaucracy in socialist economies failed to cope with the non-routine character of innovation (Nelson 1996: 81n). Even regarding the development process as a whole, the behavioural-evolutionary approach departs from the Schumpeterian scheme, as the business cycle framework is rejected, including the matter of innovation clusters. Accordingly, discontinuous change is not depicted in the behavioural-evolutionary theory of local search for process innovations, as presented by Nelson and Winter, which resembles basically a gradualist image of economic evolution (Elster 1983: 146n).

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[219] Thus it is difficult to follow O'Driscoll and Rizzo in their appreciative argument that entrepreneurship remains central in the evolutionary approach of Nelson and Winter, as it would be integrated in their analysis as a force of change (O'Driscoll and Rizzo 1985: 124n).

[220] Nelson's related claim is as follows: "Schumpeter highlighted industrial R&D as the heart of the capitalist engine: organised inventive efforts undertaken by university-trained scientists and engineers, working in special facilities, tied to particular business firms, and focused on advancing their product and process technologies" (Nelson 1996: 61). Unfortunately, this statement ignores that entrepreneurship is actually the "heart of the capitalist process" in the Schumpeterian scheme, whereas the establishment of R&D facilities mirrors an organisational rationalisation of innovation, possibly heralding the institutional decline of modern capitalism. Thus, from the Schumpeterian perspective, it is not industrial R&D that would safeguard the existence of capitalism, but rather the persistence of entrepreneurship, set in the context of the private sector with appropriately institutionalised profit incentives.

In a similar manner, attempts of modelling the behavioural-evolutionary theory of innovation have been criticised for underestimating the variations of firm behaviour in the innovative search for technologies, hence neglecting essential features of innovation and competition. This applies also to the focus on process innovations, whereas product innovations remain out of the picture (Gomulka 1990: 77).[221] Moreover, the formalised assumption that only a finite number of technological possibilities exists has been taken to the fore. Consequently, the modelling of search routines has been interpreted as an implicit process of adaptation that does not allow for novelty and uncertainty. The stochastic character of the innovation model thus promotes the image of a "lottery" of technological possibilities that draws on R&D expenditures and capital stock (Witt 1987: 96n). This type of model bears resemblance to a scheme in which experimenting firms experience "lucky draws" from a technological opportunity space, generating profits which allow for investment, expansion and growth of the firm (Scherer 1992: 1421). This implies, from an evolutionary viewpoint, that the modelling approach of Nelson and Winter is primarily concerned with variety and selection in the context of an already established economic pattern. Again, this modelling constellation does not allow for radical change in a Schumpeterian sense, which would have to include the setting up of new paths of technological evolution (Andersen 1994: 103). Hence, the general criticism, which has maintained that neo-Schumpeterian theories of innovation would fail to grasp the generation of innovations and the conditions of their implementation, also applies to the behavioural and evolutionary approach (Witt 1995: 86).

Again, this problem of dealing with novelty points in the direction of entrepreneurship and its diverse institutional manifestations. Evolutionary ideas may actually provide crucial insights into the role of entrepreneurship for economic change, as soon as the aspect of institutional variety is highlighted, which had been crucial for Schumpeter's theory of innovation. As Schumpeterian entrepreneurship denotes a contextual matter, rooted in a historically evolving variety of economic institutions, a narrow perception of economic behaviour would miss the essential characteristics of the entrepreneurial function.[222] Diversity in economic behaviour allows both for rational and irrational segments of creation and discovery in the trial and error process of evolutionary change. In other words, it is not the rationality of behaviour, but its variety which supports the dynamism of economic development (Metcalfe 1998: 130).[223] Applied to real-world phenomena this line of reasoning should prove its usefulness in explaining the process of economic development not only with regard to industrial evolution in developed economies, but also concerning industrialisation in developing economies. Granted the differentiation of development levels in terms of per capita income and other indicators, the specificity of entrepreneurship in industrialising economies may be derived especially from institutional context, market potential, and mechanisms for the assimilation of new technologies. An assessment of the Schumpeterian perspective with regard to developing economies then illustrates the possibilities of carrying out entrepreneurial functions in a conceptual continuum between innovation and coordination.

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[221] A related argument claims that Nelson and Winter follow Schumpeter's exclusive orientation at the supply-side of markets, neglecting the role of demand and user needs (Witt 1987: 98).

[222] The evolutionary content of that idea has been put forward as follows: "Clearly, the corollary in human systems of the 'genetic diversity' underlying biological evolution is the existence of many different views and values. This will lead to diverse behaviours and explorations" (Allen 1988: 110).

[223] The notion of the representative agent in neoclassical theory then represents the most prominent contrast to the notion of entrepreneurship as a phenomenon that promotes the complexity of an evolving economic system (Metcalfe 2001: 19).

8 ECONOMIC DEVELOPMENT AND VARIETIES OF ENTREPRENEURSHIP

8.1 SCHUMPETERIAN PERSPECTIVES IN DEVELOPING ECONOMIES

Schumpeter's theory of economic development analyses evolutionary change in capitalist economies, driven by the entrepreneurial carrying out of innovations. Its analytical orientation includes distinct phases of capitalist development that cover the historical range of epochal technological revolutions, for instance the process of industrialisation in Western Europe. Therefore, despite its conceptual focus on the formation of competitive and trustified capitalism in the Western hemisphere, developmental problems of industrialising, less-developed economies are an implicit part of the Schumpeterian research program. Evidently, then, the Schumpeterian perspective had a constitutive influence on the emergence of development economics as a specialised economic discipline, pinpointing industrialisation and structural change in the economic performance of less-developed economies. Indeed, the phenomena of evolutionary change which are addressed in Schumpeter's theorising apply basically to all capitalist economies regardless of their developmental status. Still, in comparison with the line of reasoning that has been commonly pursued in development economics, a distinct characteristic of Schumpeter's approach to economic development rests on the dismissal of well-designed planning schemes which include the realisation of certain socio-economic objectives.[224] Schumpeter thus discussed the matter of innovation as an engine of development with a decidedly market-oriented attitude that allowed for an active role of government without adhering to comprehensive policy interventions into the process of industrial restructuring.

The interventionist policy orientation of "high development theory" with its structuralist theoretical foundations focussed on the regulation of strategic complementarity in economic development, involving a reconsideration of the effects exercised by external economies and increasing returns (Krugman 1993: 25). In particular, the doctrine of "balanced growth", advocated by Rosenstein-Rodan and Nurske, aimed at matching output structures to domestic demand. It considered the absence of complete markets and perfectly functioning price systems as an obstacle to the formation of adequate expectations on growth in firms and industries, hence postulating an outstanding role for government in industrial restructuring. The "unbalanced growth" approach of Hirschman, however, claimed that industrial imbalances caused by excess demand could be useful in creating tensions that would stimulate focused efforts in those industries in which the problem of mobilising unused resources was most pressing. In view of that, capabilities in rational decision making were seen as the decisive scarcity in less-developed economies, as even governments could not compute the information necessary for designing growth strategies (Hirschman 1958: 24n). According to Hirschman, then, the stimulation of investment by the means of investment should be denoted as "industrial linkage", representing resource flows either as backward or

[224] Indeed, it has been remarked that Schumpeter did not perceive economic development in terms of a "wish list of economic objectives" to be implemented by a set of adequately designed policies (Dyer 1988: 39).

forward linkages which depend on the source of developmental impulses in the input-output structure of an economy. Accordingly, the strategic promotion of industrial linkages should emerge as a major policy issue (Hirschman 1989: 210n). However, complementing these policy efforts, a dual character of private sector entrepreneurship was also taken to the fore, involving capabilities for leadership as well as for cooperation (Hirschman 1958: 16n). As such, both characteristics were in agreement with Schumpeter's presentation of entrepreneurial capabilities in the operation of large-scale innovations with an economy-wide impact.

However, with regard to the general applicability of Schumpeter's approach to problems of less-developed economies, it has been suggested that these economies exhibit a specific growth pattern that resembles the Schumpeterian notion of an adaptive response in a gradual growth process, based on population growth, savings, and the general expansion of knowledge. This growth pattern needs to be distinguished from the evolutionary case of innovation-driven development in accordance with Schumpeter's scheme (Rimmer 1961: 446n). Thus, regarding the conceptual specificity of underdevelopment from the Schumpeterian perspective, arguments on the empirical relevance of technological innovation excelled.[225] However, the distinction of innovation and assimilation becomes vague when it is acknowledged that it is not the degree of scientific novelty but the economic application of already existing ideas which characterises an innovation. Hence, following Schumpeter, innovation needs to be perceived in relation to the actual state of the economic process, not in relation to the fund of available technological knowledge. As a result of the local character and tacitness of knowledge, a technology which is established in a certain country may be perceived as an innovation when put to use elsewhere. The assimilation of technologies in local conditions thus requires entrepreneurial capabilities (Rimmer 1961: 436n).[226] In this context, Schumpeter's distinction of invention and innovation applies, for established technologies could be dealt with as inventions from the position of the assimilating economy, involving complex knowledge which needs to be implemented within a certain technological and institutional context by entrepreneurial agents (Röpke 1992: 9n).[227] In conclusion, then, the Schumpeterian approach to entrepreneurship and innovation may remain valid for the specific situation of less-developed economies, as soon as it is broadened in a way that allows for treating the assimilation of technologies

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[225] Hence, it was also argued that entrepreneurship in developing economies would exhibit a distinct character, differing from the pioneering quality of Schumpeterian entrepreneurship due to the assimilation of already existing technologies as the prevalent pattern of technological change (Wallich 1958: 193n). Singer even proposed that social indicators rather than profit incentives should drive efforts in development planning, as the private sector would be preoccupied with imitative strategies in routine production (Singer 1953: 19n).

[226] A variant of that problem is posed by the distinction of internal and external development factors. From the standpoint of the host country, foreign direct investment may represent an external factor, because the investment resources have not been generated in the domestic economic process (Rimmer 1961: 438). Consequently, foreign investors would not qualify as carriers of local entrepreneurship. However, due to the internationalisation of economic processes, this difference loses its relevance, so that multinational enterprises constitute a crucial component in the entrepreneurial potential of industrialising and industrialised economies alike, resembling the migration of foreign entrepreneurs during industrialisation in Western Europe who augmented local competencies.

[227] Hence, subjective and objective novelty have been distinguished, as an objectively established innovation which has contributed to the experiences of early adopters may be subjectively novel for late adopters. This applies also to the case of technologies that are established in the generating economies, but new to the assimilating economies in which they need to be adapted to the local context (Röpke 1992: 13).

as an entrepreneurial process which combines both innovative and imitative components.
Related to that matter has been a controversy on the carriers of entrepreneurship in developing economies, pointing to the specific role of government in carrying out the entrepreneurial function of technological innovation. Indeed, the involvement of government in the generation and assimilation of new technologies has been documented at least since the era of mercantilism.[228] From the viewpoint of economic history, Gerschenkron put forward the thesis of a specific institutional and structural pattern of industrialisation in backward economies, characterised by dispersed capital, lacking entrepreneurial talent and pressures for industrial centralisation. Banks would propel industrialisation by organising large enterprises and cartels in order to concentrate resources, thus also contributing to technology transfer from advanced economies. Even government could carry out entrepreneurial functions in the stimulation of economic development by mobilising and coordinating the use of industrial and financial resources (Gerschenkron 1962: 14n). Accordingly, Gerschenkron's approach to late industrialisation implies that the structural and institutional features of underdevelopment require government entrepreneurship as a substitute for non-existent markets and a lack of local entrepreneurial capabilities in the private sector. As such, Gerschenkron's thesis may be compatible with Schumpeterian insights on the role of the state in stimulating economic development.[229]
Variants of that perspective, with a stronger inclination for the notion of an entrepreneurial state, have evolved in the context of explorations in the development of the East Asian newly industrialising economies, arguing from an institutionalist perspective.[230] Amsden's analysis of Taiwan's late industrialisation focuses on the strategic role of state interventions in distorting relative prices, allowing for temporary and selective industrial protectionism that promoted learning effects of firms in technological imitation and assistance (Amsden 1989: 18n). Schumpeter's approach, however, is granted only a conditional relevance for late industrialisation, because innovation is said to be largely absent in the newly industrialising economies, whereas

[228] Even during the epoch that was labelled as competitive mercantilism by Schumpeter, government has been identified as a prime mover of economic growth, contributing to technological and institutional change as primary sources of growth and thus highly relevant even in those countries that were among the pioneering industrialisers (Adelman 1991: 498n).
[229] Nonetheless, closer to the general orientation of Schumpeter's position on policy interventions was the proposal that governments would perform more effectively in the setting up of institutional frameworks for private sector entrepreneurs, not by setting up public enterprises in promoted industries (Habakkuk 1958/1971: 50n). In particular, a major difference between Schumpeter and his interventionist critics from the domain of development economics lies in the perception of the state. The latter argued from the position of a political philosophy in which government expresses the will of the community in achieving the common good; a point of view basically shared by Keynes. Schumpeter, however, accounted for conflicting social groups and classes; thus addressing constellations that have remained highly relevant in developing countries (Rimmer 1961: 425n).
[230] The debate on an entrepreneurial state, that is basically on the state capacity in mobilising resources for innovation and technology assimilation, has been stimulated by the concept of the "developmental state", originally put forward as a device for analysing Japanese industrial policies. As compared with the regulatory function of states in economies that pioneered industrialisation, focusing on the set up of rules governing the economic process, the state in late industrialising economies exhibits a developmental function, for it is concerned with the economic process itself. The economic policy of developmental states, oriented at industrial policy concerns, is said to follow plan-rational and goal-oriented strategies for enhancing industrial competitiveness (Johnson 1982: 19n). This argument, and its controversial implications, needs to be distinguished from Shonfield's exposition of public policies for industrial development. It addressed the notion of an entrepreneurial state too, yet interpreting that notion merely in terms of public enterprise and planning efforts (Shonfield 1965: 176n).

an adaptive type of learning dominates (Amsden 1989: 140n). The entrepreneurial role of government, however, contributes to the essence of entrepreneurship in latecomer economies, namely to the introduction of processes and products that are novel to the local learning environment. The entrepreneurial function is accordingly carried out by means of strategic planning and the institutional coordination of private and public interests (Amsden 1989: 79n). Wade's related "governed market" approach, applied to the industrialisation of Taiwan, rests on the assumption that governments may exercise an entrepreneurial function by stimulating investment and production in selected industries and markets, thus supporting the continuous accumulation of capital (Wade 1990: 28n).

Further expositions on the role of entrepreneurial states in industrialisation, put forward with reference to institutionalist positions, have criticised Schumpeter's approach for its emphasis of discontinuous change by disruptive innovations, neglecting problems of experimentation, discovery and learning as entrepreneurial activities in the context of uncertainty and patterns of cumulative change. Concerning the impact of institutional variety as a requirement for evolutionary change, both states and markets are perceived as an entrepreneurial terrain for reducing uncertainty and coordinating economic change (Chang and Kozul-Wright 1994: 862n). Coordination procedures in structural change, however, require a formulation of the choice sets faced by boundedly rational agents. Thus a specific vision at an early stage of structural change needs to be articulated in order to promote lower information and transaction costs. The mobilisation of resources and the establishment of adequate institutional means for an implementation of the preferably consensual vision belongs also to the activity of an entrepreneurial state, based on the formation of coordination structures. Hence, both the provision of a developmental vision and its institutional realisation emerge as entrepreneurial activities of the state, accompanied by its role in conflict management (Chang 1994: 298n). This corresponds with the thesis of an embeddedness of state bureaucracies in a wider terrain of social relationships as a condition of industrial evolution, exemplified by the East Asian economies. The need for information, knowledge and strategic orientation, which is most pressing in industrialising economies, then corresponds with requirements for the selective stimulation, complementation and reinforcement of entrepreneurship which have been demanded in the theories of Hirschman and Gerschenkron (Evans 1995: 31n). In conclusion, state bureaucracies may house crucial entrepreneurial initiatives in economic development by promoting innovation-related interactions (Evans 1995: 250).

Even from an Austrian point of view, the matter of industrialisation and the entrepreneurial state has been investigated. It is argued that Schumpeterian entrepreneurship has been overestimated in the analysis of economic development, as compared with Kirzner's market process theory. The latter is said to excel in relevance, for economic change in developing economies is less marked by technological innovation than by the discovery of new markets. Three types of entrepreneurial functions in economic development are presented, namely routine coordination, improving imitation, and creative innovation, based on the degree of ordinariness that is associated with discovery procedures (Yu 1998: 355n). These domains of entrepreneurial activity are related with stages of industrialisation in which certain degrees of adaptive or creative response are exercised by entrepreneurial agents. First, a stage of routine conduct in early industrialisation. In this case, adaptive activities and industrial followership dominate the development process. Second, a stage of imitation during the catch-up growth performance of latecomer economies, characterised by entrepreneurial learning and the continuous improvement of products and processes in

terms of an adaptive imitation. Third, a stage of creative innovation, resembling the Schumpeterian scheme of creative response. In this case, industrial change is driven by major innovations that revolutionise the production structure of an economy (Yu 1998: 357n).

In this context, it is claimed that governments may act as entrepreneurs when their agents exhibit Kirznerian alertness and error-correction in the discovery of development opportunities. The formulation and revision of plans during the economic process, involving trial-and-error learning procedures, is said to be most relevant for private and public agents alike (Yu 1997: 51). In order to grasp the range of activities implemented by an entrepreneurial state, the categories of facilitative and directive intervention are adopted. The former denotes the institutional and structural shaping of the environment for private entrepreneurship, usually promoted by the provision of public goods, whereas the latter points to direct interference with the market process in terms of selective incentives, regulations or the formation of public enterprises (Yu 1997: 51n). This is of course an unconventional position within the Austrian market process framework, in which government interventions are usually rejected by invoking Hayekian arguments on the policy-related "pretence of knowledge". However, the arguments of flexibility, communication and learning as policy devices, derived from the experience of the East Asian newly industrialising economies, provide insights concerning the entrepreneurial role of private and public agents in economic development (Yu 1997: 55n).

In addition to that aspect of specific carriers of the entrepreneurial function in industrialising economies, the role of the institutional environment in promoting or obstructing entrepreneurship has been examined. Schumpeter's institutional assumptions include a well-established industrial structure and financial system as it has emerged during the era of competitive capitalism. This assumption is at odds with conditions in industrialising economies, where the evolution of these institutional forms belongs to the fundamental problems of the development process. Hence, it has been suggested that the Schumpeterian theoretical scheme should be viewed first of all as an explanation of the dynamics of particular stages of advanced capitalism (Wiles 1967: 206n). Although this suggestion ignores the conceptual historicity of Schumpeter's approach, it is particularly valid with regard to the analytical range of Schumpeter's theoretical system of categories and functions. Indeed, with regard to institutional forms of credit creation, Schumpeter's theory of economic development is primarily a theory of capitalist evolution.

Still, further aspects of the institutional environment in industrialising economies need to be considered. A decisive obstacles to entrepreneurial activity results from the lack of risk-reducing institutions, posing a hindrance to investment and the attraction of entrepreneurial ability to the industrial sector (Habakkuk 1958/1971: 48). Indeed, the examination of entrepreneurship in developing economies has predominantly focussed on problems of uncertainty concerning investment decisions and the expected growth performance (Leff 1979: 46n). It has been claimed, however, that the institutional and structural constraints on entrepreneurship may be relaxed by public policy measures in risk-reduction and the initiatives of public enterprises for generating externalities in the promotion of entrepreneurship. Moreover, enterprise "groups" like the Japanese *zaibatsu* have emerged as a reflection of entrepreneurial potential beyond individual entrepreneurship, combining finance and production in accordance with Gerschenkron's thesis of substitutes for private sector entrepreneurship (Leff 1979: 52n). It is noteworthy that motives of family orientation seem to prevail in these "groups", hence seemingly confronting Schumpeter's theses on the decline of the family (Leff 1979. 57).

Still, apart from the matter of market power and monopolisation, problems persist in the specific area of technological innovation, caused by problems concerning the appropriability of returns and the lack of experience in technology management (Leff 1979: 54n).
In summary, it has been proposed that Schumpeter's approach may be applied to problems of underdevelopment, as it allows for the presentation of theses on entrepreneurial activities of governments and a perception of technology assimilation as an entrepreneurial process. Moreover, the recognition of economic motivations beyond purely pecuniary motives, stated as a feature of Schumpeterian entrepreneurship, would fit the institutional setting of developing economies quite well (Wiles 1967: 197n). Still, the matter of unemployed and underutilised resources as an ubiquitous phenomenon in these economies could signal a major gap between the Schumpeterian scheme and empirical reality, because the former assumes full employment as a point of departure for the carrying out of innovations (Wiles 1967: 201n). Although this hint at differences between theoretical abstraction and empirical reality rather refers to methodological problems, still, it rightly points at market-making and market-completion as coordination-oriented entrepreneurial activities, dealing with underutilised resources in the development process, and supplementing the Schumpeterian type of entrepreneurship. Furthermore, it has been pointed out that another difference between the reality of developing economies and the Schumpeterian scheme of economic development would lie in the specific institutional conditions of inertia and rigidity that characterise underdevelopment (Rimmer 1961: 447). Therefore, the coordinating and market-making functions of entrepreneurship, perceived as essential components of industrialisation, are well viewed in the context of specified institutional conditions in terms of the cultures of entrepreneurship.

8.2 MARKETS, INSTITUTIONS AND TRANSACTION COSTS

The economic process in developing economies is marked by evolutionary characteristics, namely economic change based on innovation and the competitive restructuring of established structures. Although Schumpeterian ideas left a decisive mark on corresponding discussions in development economics, still the distinctly evolutionary content of these discussions remained rather marginal. At least the "big push" concepts of industrialisation that have been proposed in differing varieties represent aspects of Schumpeterian saltationism. However, the emergence of the matter of coordination as a dominant topic in the discourse on economic development led to further attempts of combining theorising on entrepreneurship with the neoclassical approach. Moreover, related to the coordination function of entrepreneurship, its market-making aspect has been taken to the fore as an activity that would contribute to the cumulative set up of industrial linkages and thus to the emergence of more complex industrial structures. Accounting for the role of the institutional framework then implies that the impact of transaction costs on economic activity is reconsidered, additionally shaping the formation and articulation of the entrepreneurial potential in an economic system.
In elaborating on the coordination function of entrepreneurship, Leibenstein has combined the matter of entrepreneurship with the concept of "X-efficiency", addressing the inefficient realisation of a productive potential, that is inefficiencies resulting from missed opportunities in the utilisation of resources in productive organisations. These inefficiencies are rooted in motivational problems regarding the use of economic

opportunities (Leibenstein 1981: 98n). Two types of entrepreneurial coordination are distinguished. Routine entrepreneurship of a management type is concerned with coordinating economic activity on complete markets. Schumpeterian "new type" entrepreneurship is conducted on incomplete markets with uncertain production possibilities in the absence of fully-specified production functions (Leibenstein 1968: 72n). Accounting for the motivational aspect of microeconomic inefficiency, these entrepreneurs are depicted as individuals with specific motivations and skills, enabling them to take advantage of existing economic opportunities by means of continuous search (Leibenstein 1987: 118n). This parallels Leibenstein's view of the market as a domain of persistent slack which allows for the intervention of entrepreneurial agents who are concerned with input completion (Hébert and Link 1982: 100n). These entrepreneurs are portrayed as inter-market operators who are concerned with connecting markets, filling gaps in deficient markets, completing inputs, and creating firms as organisational units.

All these activities are of analytical significance in developing economies that are characterised by incomplete and imperfect market structures as well as a need for capacity creation (Leibenstein 1968: 74n). In this perspective of market perfection, the carriers of entrepreneurship are exclusively approached as individual agents. Leibenstein then refers to the inter-individual dimension of trustworthiness as a component of the economic process, for instance due to the asymmetrically distributed access to market information and insider knowledge (Leibenstein 1976: 45). In the incomplete institutional order of developing economies, thus, the role of families and kinship-based networks becomes crucial for setting up business ventures. This perspective indicates the major role of trade and exchange relations in Leibenstein's perception of entrepreneurial activity (Leibenstein 1968: 81). Accordingly, Leibenstein focuses on cases in which only a low degree of novelty is stimulated by the type of non-routine entrepreneurial activity, presented as the most frequent aspect of industrial change (Leibenstein 1987: 121). This stylisation of the entrepreneur as an economic agent who is engaged in market exchange reflects a shift in the analytical perspective which seems to lead away from the production-oriented Schumpeterian position, approaching instead perspectives that resemble Austrian market process theory. Indeed, Leibenstein considers the Kirznerian approach as valid, although he claims in a rather neoclassical spirit that entrepreneurship and equilibrium may coexist in a constellation of "loose equilibrium" (Leibenstein 1987: 122).

Further attempts of integrating diverse approaches have been taken up in Casson's theory of entrepreneurship, also aiming at a reconsideration of the equilibrium orientation which has been brought into play by the analytical schemes of transaction cost economics. In an explicit attempt to counter the conceptual depersonalisation of the economic process, as promoted by neoclassical theories which should be augmented by Schumpeterian, Austrian and institutionalist ideas, Casson presents his definition of entrepreneurship, claiming that "an entrepreneur is someone who specializes in taking judgmental decisions about the coordination of scarce resources" (Casson 1982: 23).[231] Hence, the entrepreneur is an individual "market maker" in the private sector of an economy, a self-interested specialist in decision-making, who exercises coordination

[231] Basically, this setting bears resemblance to a decidedly neoclassical approach, namely Schultz's human capital theory which claims that entrepreneurship and specialised human capital, defined as acquired useful abilities and perceived as a source of increasing returns in economic growth, need to be viewed as interrelated concepts. The related notion of entrepreneurship points at the optimising behaviour of economic agents who take part in the equilibration of markets by reallocating resources (Schultz 1993: 48).

functions on markets that are conditioned by asymmetric information and transaction costs (Casson 1982: 23n). The development potential of an economy is approached as a function of its endowments of entrepreneurship. A major policy implication regarding developing economies then points to the problem of coping with a lack of entrepreneurial supplies. International dependency relations and widening efficiency gaps may arise when foreign entrepreneurs make exclusive use of opportunities that are left for exploitation by local entrepreneurs (Casson 1982: 11). At this point, at least, Casson's concept of entrepreneurial endowments seems to indicate a mislead static perspective on entrepreneurship as a scare resource, whereas a preferable dynamic view would address entrepreneurial capabilities as endogenously evolving components of the development process.

The latter position would also contribute to Casson's claim of complementarity with other theories of entrepreneurship. Indeed, Casson's approach has been praised as a useful synthesis of Knight's, Schumpeter's and Kirzner's concepts (Blaug 1986: 175). Casson himself refers to Leibenstein, who is nonetheless criticised for an overemphasis on psychological foundations of economic behaviour, as well as to Hayek and Kirzner, despite rejecting their subjectivist epistemology. Knight and Schumpeter, however, stand out most affirmatively, and especially Schumpeter's insistence on the creative aspects of entrepreneurship is appreciated (Casson 1982: 364n). While Austrian entrepreneurship allegedly deals with discovery processes in a given set of markets, the Schumpeterian variant is said to differ in terms of entrepreneurial market creation and destruction. Casson concludes: "Schumpeter's entrepreneurs (...) are not just the mechanism, or the agents, through which the market system operates, they are the very creators of the system itself" (Casson 1982: 381). Still, this conclusion neglects the crucial matter of novelty, uncertainty, and leadership, thus reducing the Schumpeterian scheme to the mere establishment of market relations for commercialising novel goods and services. However, in a truly Schumpeterian fashion, Casson has also focused on institutional factors like reputation, which is said to be mobilised by entrepreneurs in order to establish contacts with other market agents, especially with providers of credit (Casson 1982: 210n). This recognition of the institutional range of entrepreneurial activities confirms the assessment that Casson's notion of entrepreneurship exceeds the Kirznerian framework, in particular regarding the institutional dimension (Loasby 1984: 78n).

Further attempts of integrating the matter of entrepreneurship in neoclassical frameworks have been dealing with the impact of institutional rules and norms as constraints of entrepreneurship. Baumol, for instance, has referred to Schumpeterian entrepreneurs as leaders who puts new ideas into practice, then claiming that the sources of economic growth may be rooted in the availability of entrepreneurial talent as well as in their motivational mechanism (Baumol 1968: 66). The matter of availability, again based on a perception of entrepreneurship as a scarce resource, leads to efficiency problems in decentral resource allocation and its institutional conditions. Baumol even claims that it is the set of rules and not the supply of entrepreneurs or the nature of their objectives that undergoes significant changes, thus affecting the allocation of entrepreneurial resources. Accordingly it is proposed that entrepreneurial motivation should be perceived as a datum, whereas changes in the institutional framework may constitute an analytical focus (Baumol 1990: 916). Consequently, the notion of a "spirit of entrepreneurship" as an autonomous factor of economic change is rejected. Means for designing corresponding policy measures are instead traced in the provision of rewards for entrepreneurial activity, contributing to the mobilising function of the institutional order of markets (Baumol 1990: 894n).

Furthermore, in order to gain more policy relevant insights, Baumol proposes that the Schumpeterian notion of entrepreneurship should be extended to include further domains of profit-oriented activity, like rent-seeking. Thus it is claimed that entrepreneurship need not increase welfare, for rent-seeking could also include the sabotage of production, based on pecuniary motives, as put forward in Veblen's theory of business enterprise. Hence, the institutional framework of an economy plays a decisive role in channelling entrepreneurial resources to productive or unproductive uses (Baumol 1990: 897n). In accordance with this hint at the situation of developing countries as well as transition economies, it has been proposed that a notion of entrepreneurship which underlines the functions of mobilising resources and supplementing markets in a specific institutional context seems to be most appropriate for analysing transformation processes (Tyson et al. 1994: 168n). Nonetheless, conceptual problems with Baumol's approach arise from the characterisation of representative entrepreneurs as historically invariant agents. This position is at odds with institutional considerations of entrepreneurship. For instance, rules, norms and habitual devices lack from a well-defined objective meaning, since their perception is based on cognitive interpretation. Coping with institutional frameworks hence implies that a specific economic "spirit" may indeed exhibit a decisive impact on entrepreneurial orientation. This is also consistent with the Schumpeterian position on the historicity of entrepreneurship, sensed as incompatible with the conceptual figure of representative entrepreneurs.

However, the exploration of entrepreneurship in the context of formal and informal institutional frameworks points to the matter of transaction costs and institutional change as features of economic development. North derives his transaction cost approach to institutional change from arguments of asymmetrical information and uncertainty. The costliness of information is presented as the key to transaction costs, which consist of the costs of measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreements, both of them contributing to the evolution of institutions (North 1990: 27). Reducing uncertainty by establishing a stable yet not necessarily efficient structure to interaction, formal institutions such as laws or regulations and informal institutions such as conventions or belief-systems are presented as constraints of economic choices, subject to cognitive variations (North 1990: 3n).[232] North then introduces the concept of the entrepreneur broadly as the agent of change who creates organisations and discovers markets, driving economic development by responding to data changes: "The agent of change is the individual entrepreneur responding to the incentives embodied in the institutional framework. The sources of change are changing relative prices or preferences. The process of change is overwhelmingly an incremental one" (North 1990: 83). Entrepreneurial capability is derived from the argument that entrepreneurs are wealth-maximisers who accumulate implicit knowledge in the context of

[232] An alternative definition of transaction costs has been provided by Williamson. He distinguishes ex ante and ex post types: the former denote costs of drafting, negotiating and safeguarding an agreement, the latter deal with maladaptation costs in the case of transactions drifting out of alignment, haggling costs in the case of the correction of misalignments, and the costs of setting up as well as running a governance structure, accompanied by bonding costs concerning secure commitments (Williamson 1985: 20n). As can be readily deduced from that exposition, Williamson's scheme resembles the law and economics tradition in the theory of the firm. With its explicit use of mechanistic metaphors, it seems to be less compatible with evolutionary approaches than North's historically-oriented concept. This holds especially with regard to Williamson's characterisation of transaction costs as economic counterpart to friction, presenting the latter as a pervasive phenomenon in both economic and physical systems (Williamson 1989: 178).

institutional incentives and cognitive capacities. This knowledge supports the evaluation of market opportunities (North 1990: 73n).
Yet it has been argued that North's reference to the role of changes in relative prices as incentives for innovation would confuse cause and effect, for it is innovation and the related changes in the structure of production which cause a major reconfiguration of prices (Stolper 1995: 22n). The latter position mirrors the Schumpeterian perspective on the relationship between institutions and innovation. Moreover, it may be emphasised that North's theory of institutional change refers to cases which may be subsumed under the notion of economic growth in Schumpeter's terms, as distinct from economic development. This is indicated by the crucial role of population growth in changing relative prices, whereas innovation by entrepreneurial intervention is not embraced in likewise extensive terms. Earlier contributions of North, then elaborating on the economic history of the United States, even held that entrepreneurship should not be taken seriously as an autonomous factor of economic change, for market economies would respond to changing data by an almost automatic generation of innovations (Kilby 1971: 3). Therefore, it seems that the inclusion of entrepreneurship in recent advances of North's approach principally contributes to the characterisation of an impersonal mechanism of coordination and change rather than to the analysis of a specific type of economic behaviour.[233]
Nonetheless, a noteworthy component of North's argumentation is the influence of the institutional environment on the formation of entrepreneurial capability as well as on its articulation in the economic system. This perspective has been applied to transaction cost arguments on entrepreneurship in developing economies. In this type of argumentation, then, the actual relationship of culture and economy needs to be clarified. Indeed, the matter of cultural conditions in stimulating entrepreneurship as a feature of research on industrialisation in developing economies seems to have been overlooked in the contributions of Hirschman and Gerschenkron, among others, who dealt with the role of entrepreneurship in economic development but considered its presence as a function of appropriate economic conditions, serving as a conductor that connects diverse fields of activity. In contrast to that, the argument has been put forward that entrepreneurship is a catalyst of the development process, situated in a cultural setting which promotes its emergence and sustains its presence (Berger 1991: 13n). Even in recent advances of such a culturally-sensitive theory of entrepreneurship, institutional factors like national ideologies and the motives of power and control are discussed as basic elements of theorising on the institutional determinants of entrepreneurship (Berger 1991: 22n).
The development pattern of the of East Asian newly industrialising economies has provided a prominent research topic for related explorations in entrepreneurship, including the role of Overseas Chinese business and trading networks. Resembling Schumpeter's theses on the non-hedonistic foundations of entrepreneurial activity, the family-oriented business attitude of these entrepreneurs has been highlighted as evidence for the persistence of traditional values in the motivation of entrepreneurial behaviour. Moreover, assessed from this viewpoint, activities of small-scale entrepreneurship in urban environments have been perceived as a decisive engine of growth in Third World economies (Berger 1991: 29n). Furthermore, accounting for substantial uncertainty on the legal enforcement of contracts as a reason for the

[233] Schefold has argued that materialist modes of explaining historical processes are not the exclusive property of Marxist approaches, as revealed by the so-called new economic history, with North as its major representative, and related attempts of applying a universal scheme of transaction costs to the matter of institutional change in economic history (Schefold 1988a: 134).

comparatively high level of transaction costs in developing economies, the formation of entrepreneurial networks based on ethnical ties and family-orientation has been explained in terms of trust and reputation. These institutional factors are said to contribute to the reduction of transaction costs among the trading parties (Landa 1991: 63n). Entrepreneurial functions of gap-filling coordination, as elaborated by Leibenstein, are therefore dependent on the capacity for establishing these kinds of entrepreneurial networks that contribute to the development process by exercising a middle-man function in connecting markets and economic agents beyond the activities of large business groups (Landa 1991: 61n).
Summing up, the assessment of economic motivation as a driving force of entrepreneurship in industrialisation and economic development implies a reconsideration of approaches that had been formulated in the context of the German Historical School, with Max Weber as an excelling representative. Interpreting this conceptual groundwork in terms of a one-sided derivation of economic activity from an invariant cultural background would misrepresent its basic concern. More appropriate is a perception in terms of "cultural reciprocity", that is, an interdependence of the economic and cultural sphere, not necessarily pointing to their particular subordination (Jones 1994: 11n). This position is also relevant for a characterisation of Schumpeter's approach, in which entrepreneurship is conditioned by the cultural framework of the economic system of modern capitalism, while contributing to its modification and even decomposition. In accordance with that proposition, the cultural impact on shaping entrepreneurial activity has been described as an incentive mechanism which is constituted by beliefs, norms, and values, which are best displayed in terms of cultural diversity (Karayannis 1996: 190n). Given the interdependence and mutual structuration of cultural and economic domains, it is fair to suggest that this diversity will be reflected by complementing types of entrepreneurship, involving both the functions of innovation and coordination. A related typology of entrepreneurship should parallel these concerns.

8.3 INNOVATION AND COORDINATION: A TYPOLOGY OF ENTREPRENEURSHIP

It has been maintained that the multidimensional character of entrepreneurship may be grasped by three specific types. Routine entrepreneurship denotes problem-solving activity in terms of an economising adaptation of inputs to traditional uses, typical for the setting of a circular flow. Arbitrage entrepreneurship is concerned with the discovery and exploitation of unrecognised opportunities for the realisation of profit, absorbing uncertainty and restoring equilibrium in terms of the market process approach. Innovative entrepreneurship then corresponds to the generation of innovations which increase uncertainty and create arbitrage opportunities, resembling Schumpeterian entrepreneurship (Röpke 1992: 3n). [234] Innovative entrepreneurship is crucial for evolutionary processes, for innovation creates major arbitrage opportunities,

[234] An earlier exposition by Redlich distinguished three strands of theorising on entrepreneurship. First, entrepreneurship as decision-making in the coordination of the production process, derived from the distinction of entrepreneurs and capitalists which had become prominent with Say. According to Redlich, this line of argumentation belongs to the domain of Spiethoff's economic gestalt theory. Second, entrepreneurship as risk-bearing, a concept brought up by Cantillon and refined by Knight, delegated to the domain of pure theory, for it represented only an isolated facet of the much richer historical setting. Third, the Schumpeterian theory of entrepreneurship as the carrying out of innovation (Redlich 1964: 75n).

providing impulses for routine and arbitrage activities. Röpke even claims that the meaning and function of all these types is well represented in Schumpeter's scheme of economic evolution, based on the sequence of innovation – arbitrage – equilibrium – innovation (Röpke 1990: 113n).[235] Still, it may be suggested that the notion of routine entrepreneurship is presented unsatisfactorily, at least from the Schumpeterian point of view, for entrepreneurship and routine could be understood as mutually exclusive concepts. Delegating this type of routine activity to the area of routine management would allow for a more useful schematic distinction of innovation and arbitrage as essential characteristics of entrepreneurial activity. Hence, in summary, it may be the most appropriate procedure to distinguish two broad strands of entrepreneurial concepts, namely, those that deal with the carrying out of innovation and those that deal with the coordination of economic processes, representing poles of argumentation that frame a continuum of arguments on the role of novelty, uncertainty and stability in the process of economic development.[236] In outlining this scheme of differentiation, the dual model of creation and discovery would have to be reconsidered, as well as the matter of production and exchange as distinct economic spheres.

The latter have been explored by Pasinetti as devices for delimiting schools of economic thought. In this case, "trade" and "industry" are identified as distinct phases of capitalist development, which allow for a characterisation of the context that shaped the ideas under consideration. According to that scheme, economic theories deal to varying degrees with the matter of trade in terms of exchange on the one hand, and industry in terms production on the other hand. The "trade" approach is essentially static and rationality-oriented, whereas the "industry" approach provides dynamic concepts, involving the material transformation of resources, learning processes of economic agents and the structural change of industries and economies (Pasinetti 1981: 2n). For the purpose of assessing diverse approaches to entrepreneurship, however, a distinction between innovation and coordination should be more appropriate. Casson, for instance, discusses entrepreneurial decision-making in complex systems by pointing to a "high-level entrepreneurship", dealing with system-wide coordination in terms of Schumpeterian innovation, as well as "low-level entrepreneurship", concerned with limited coordination in terms of Kirznerian arbitrage (Casson 1990: 89n). Still, for the sake of precision, the entrepreneurial function of innovation should deal predominantly with the generation of novelty in an economic system, as coordination should focus on its adoption; while both functions need to be viewed as conceptually equivalent. Accordingly, it may be suggested that innovation reflects the function of establishing new markets and new areas of economic activity; whereas, coordination deals with market making and market completion by the discovery of resource gaps and the set up of linkages, dealing with arbitrage and transaction costs in the context of increasing resource efficiency.

In the case of Schumpeterian entrepreneurship, the function of carrying out innovation represents an outstanding feature of the theoretical system it is part of. However, Redlich claimed that the specificity of the Schumpeterian perspective is based on predominantly macroeconomic features of the entrepreneurial function, distinct from the

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[235] A related approach has distinguished ordinary and extraordinary entrepreneurship, contrasting the routine of discovery processes with an extraordinary carrying out of innovation. Routine entrepreneurship then denotes a coordinating, gap-filling and input-completing function, whereas imitative entrepreneurship focuses on perfecting modifications, while Schumpeterian entrepreneurship covers major innovations that drive the creative destruction of firms and industries (Yu 1998: 355n).

[236] Both of these perspectives are related with specific capability-oriented aspects, namely leadership in the case of innovation and alertness in the case of coordination (Swoboda 1984: 21).

microeconomic position which is prevalent in those strands of thought that tie the entrepreneur exclusively to the organisational domain of the enterprise (Redlich 1964: 77). Still, two more distinctive features of the Schumpeterian approach should be added. First, the orientation towards industrial structures and their competitive change, as denoted by the process of creative destruction. Second, the institutional dimension of entrepreneurial capabilities. Consequently, in modification of Redlich's thesis, it may be argued that Schumpeter's concept of entrepreneurship provides the both structural and institutional foundations for a macro-perspective on economic development which marks the orientation of his theoretical framework.

Nonetheless, Schumpeter's approach exhibits diverse deficits. A frequent assessment addresses deficits in the conceptualisation of novelty, which is sensed as indispensable both in the spheres of invention and innovation, but allegedly neglected by Schumpeter due to the perception of innovation as the commercialisation of available knowledge, transformed to a productive force by entrepreneurial activities (Ruttan 1959: 601n). A major difficulty with Schumpeter's approach then points to analytical problems in the classification of scientific inventions as exogenous or endogenous factors of innovation respectively (Freeman 1992: 75n). In this context, it has been suggested that Schumpeter's approach treats technology as a "black box", overlooking historical and empirical dimensions of R&D, although the latter should be considered as an activity which is endogenous to the economic process, subject to entrepreneurial interventions (Parayil 1991: 83n). Moreover, from an Austrian position, it has been criticised that new knowledge seems to be freely available in the form of codified data. This seems to attribute to entrepreneurs an infallible market knowledge, excluding the potential of subjective entrepreneurial error (Berg and Brandt 1998: 244n). Also the matter of diffusion is allegedly presented in a manner that ignores the possibilities of innovative modifications and even radical improvements during the diffusion process. It has been concluded that the aspects of collective learning as well as the systemic character of innovation are neglected (Hagedoorn 1994: 9n).

Accordingly, Schumpeter's approach is criticised for neglecting the role of market demand and user-needs in the stimulation of innovations; an argument which is related to an alleged underestimation of the empirical variety of innovation types beyond the clustering of breakthrough innovations, like gradual improvements of production processes and incremental product innovations (Freeman 1992: 75n). Still, it may be argued that Schumpeter's focus on clusters of innovations was primarily due to the research interest in the explanation of discontinuous and cyclical economic change as an epochal historical phenomenon, consciously excluding minor innovations. However, another striking argument has been put forward on competition and structural change, addressing productivity differentials among industries. These differentials could lead to a shortage of basic resources and intermediate goods in the expansion of new industries, thus posing a hindrance for the continuous competing down of established industries by entrepreneurial ventures (Freeman et al. 1982: 32n). This argument states that the "creative destruction" that shapes industrial restructuring requires the coordinating type of entrepreneurial activity, that is, entrepreneurial coordination as a function in the development process. This is also in agreement with Schumpeter's thesis that innovative pioneers depend on followers and imitators who contribute in varying degrees to the stabilisation of the new markets by taking advantage of the business opportunities they offer.

In conceptualising coordination-oriented entrepreneurship, the Kirznerian approach stands out as a theoretical alternative to the Schumpeterian position, yet providing evidence for a complementary relationship. It has been claimed that both Austrian and

neoclassical theories take the matter of market exchange as their analytical point of departure, usually arguing on the basis of given resource endowments, preferences and technologies; whereas, production is approached subsequently as a case of exchanging input for output by a formalised procedure which bears resemblance to the transformation of commodities to utility (Loasby 1983: 106n). Indeed, Kirzner's research agenda, involving problems such as the functions of the decentral allocation mechanism of markets, are closer to general equilibrium theory than to Schumpeter's fundamental concern with economic crises, cycles and development patterns. Still, economic change from a Walrasian perspective would be stimulated by an external change in the data, for instance in available technologies, that leads to a disturbance of general equilibrium, as some plans of economic agents are not realised, resulting in excess demand. The auctioneer as a central body of information clearing would adjust prices, promoting an equilibration of individual plans. In contrast to that, Kirzner focuses on entrepreneurs as individuals who make use of arbitrage opportunities, hence promoting a decentral equilibration of individual plans in the market process. In Kirzner's case, the sources of economic change are not exogenous shocks on equilibrium positions but the ever-changing data of the market process itself, accompanied by the ignorance of economic agents and driven by entrepreneurial alertness (Loasby 1982: 242n).

A common criticism of Kirzner's approach then argues that he presents an arbitrage concept that neglects the matter of imagination and productive creation as requirements for the generation of new realities beyond the discovery of already existing alternatives (Koslowski 1990: 18n). Correspondingly, Blaug has criticised Kirzner's theory of entrepreneurship for an exclusive attention to the subject of arbitrage, diverting interest from the matter of uncertainty and innovation (Blaug 1986: 175). Kirzner's theory of entrepreneurship has actually reduced entrepreneurial perception to the observation of what is already existing. The discovery of opportunities which had been overlooked before in the search space of economic agents is pinpointed, not the entrepreneurial creation of objects or relations. As entrepreneurial decisions in Kirzner's framework deal with already known price differentials, they are not fit to consider uncertain future opportunities, hence, uncertainty is excluded from the analysis (Hébert and Link 1982: 96n). Indeed, coping with production as a time-consuming activity in the Kirznerian framework implies that entrepreneurs need to anticipate future needs by mobilising practical knowledge of the future-directed type (Smith 1986: 21n). Consequently, it has been demanded that the notion of entrepreneurial alertness should be modified by accounting for capabilities of judgement, creativity and interpretation in order to achieve an analytical treatment of the phenomena of innovation that overcomes Kirzner's focus on already existing yet undiscovered profit opportunities (Lavoie 1991: 42n).[237]

The critical reconstruction of Schumpeter's and Kirzner's theories provides a useful point of departure for an examination of the relationship between both positions, accounting for their comparative advantages and disadvantages. Crucial differences result not only from the particular research agendas, namely the Schumpeterian concern with the endogenous source of economic crises, cycles and development patterns as compared with the Kirznerian concern with the determinants of price formation on

[237] It has been suggested with regard to Kirzner's attempts of modifying his approach by introducing Schumpeterian motives like imagination, creativity and uncertainty in the context of multi-period market decisions, that these modifications may allow indeed for an integration of "epoch-making activities", whereas learning from past errors would remain a basic aspect of adjustments, driven by the original Kirznerian arbitrageur (Hébert and Link 1982: 97n).

competitive markets, but also from different modes of conceptualising the economic consequences of entrepreneurial action. In this case, the equilibrating Kirznerian entrepreneur may be contrasted with the disequilibrating Schumpeterian entrepreneur, whose actions cause radical uncertainty in the Knightian sense. Moreover, the Kirznerian understanding of entrepreneurial alertness does not refer to technological innovations that change the entire structure of an economic system, as exemplified by the economic effects of "railroadisation" in Schumpeter's approach, but rather to a "smaller scale of alertness" that allows for addressing comparatively moderate types of economic change (Perelman 1999: 78).

Furthermore, Schumpeterian entrepreneurship is basically concerned with innovation arising from the recombination of the factors of production, involving their qualitative material transformation, as distinct from the exchange oriented Austrian view of the market process. Thus, it may be argued that the Kirznerian entrepreneur is basically an exponent of the catallactic market milieu, as depicted by Mises and Hayek, while the Schumpeterian entrepreneur operates in a milieu of industrial production. The former is concerned with discovering profit opportunities, the latter creates them by introducing innovation. In accordance with that, Kirznerian entrepreneurial profit reflects arbitrage opportunities which result from the entrepreneurial recognition of economic change, while the Schumpeterian approach highlights innovation rents as a result from the entrepreneurial generation of economic novelty (Loasby 1982: 242n). Accordingly, the Schumpeterian entrepreneur not only discovers already existing profit opportunities, but creates them by himself. Schumpeterian entrepreneurship thus implies an expansion of the space of production possibilities by introducing substantial novelty (Dopfer 1994: 137n).

Moreover, Kirznerian entrepreneurs promote market equilibration by exhibiting a response to changing economic data that could be summoned under the notion of Schumpeter's secondary wave of economic activity, that is the imitative tendency which follows the pioneering clusters of innovation (Loasby 1984: 79).[238] In contrast to that, Schumpeterian entrepreneurs destabilise market equilibrium, as they stimulate the opening up of price differentials. The consideration of complementary effects then arises from the viewpoint that these differentials represent profit opportunities for Kirznerian entrepreneurs who act as stabilising forces by contributing to their erosion (Ioannides 1992: 64). In other words, Schumpeterian entrepreneurs create opportunities for economic development by expanding the existing potential, while Kirznerian entrepreneurs make use of that expanded potential (Hébert and Link 1982: 99). It follows that the range of Schumpeterian innovation, with its proliferation of new profit opportunities, provides the terrain for the search and discovery procedures that characterise Kirznerian entrepreneurship. These search procedures have been acknowledged as the decisive means for outlining the development potential of the Schumpeterian clusters of innovations, exposing them to the trial-and-error experiments of the market process (Chea 1996: 205).[239] The relationship between Schumpeterian and Kirznerian entrepreneurship is thus marked by interdependence, for both types of economic activity provide indispensable opportunities for each other (Loasby 1982:

[238] This includes also the case of Walrasian entrepreneurs which have been subsumed under the concept of Schumpeter's secondary wave in which arbitrage opportunities constitute a major element of the development process. These types of imitative entrepreneurs enter profitable markets and product lines which have been set up by the innovations of Schumpeterian entrepreneurs until the zero-profit condition of Walrasian equilibrium obtains (Walker 1986: 413).

[239] Additionally, it may be proposed that Kirznerian entrepreneurship even gains in importance with the increasing complexity of the commodity space, which may reflect a volume of market entry that exceeds the volume of market exit.

244).[240] However, with reference to Kirzner's proposition of Schumpeterian development as a facet of the market process, the relationship may be reformulated in Schumpeterian terms, viewing economic development as the historical process of the rise and decline of firms and industries, as well as regions and nations, driven by innovation, yet with entrepreneurial coordination as a functional complement.
Table 3.4 summarises the essential characteristics of the Schumpeterian, innovating and Kirznerian, coordinating types of entrepreneurship. With regard to the Schumpeterian distinction between ordinary agents and entrepreneurs in Table 3.1, as discussed above, it becomes obvious that the Kirznerian entrepreneur seems to reflect characteristics which have been attributed to ordinary agents of the circular flow in Schumpeter's terms. Yet, in spite of that impression, which is based on the matter of equilibrium-orientation and gradual economic change, the Kirznerian entrepreneur is not engaged in a purely passive and habitual adaptation to changing data. Instead, he takes a markedly active stand, quite in accordance with Mises' theoretical propositions on the character of human action. This parallels Kirzner's suggestion that Schumpeterian entrepreneurship mirrors a reduced analytical focus on elitist leadership and discontinuous change, while the market process approach would include all economic agents as potential entrepreneurs, facing diverse forms of gradual change. It remains noteworthy, however, that Schumpeter and Kirzner deal with different economic problems, and thus emphasise different aspects of change. This observation is also mirrored by differences in analytical content, for Schumpeter's concept is decidedly more sensitive to variations of the historical setting.
Furthermore, the comparative exposition in Figure 8.1 provides references for examining the theoretical traditions that are subsumed under the functions of disequilibrating innovation and equilibrating coordination. In the case of the Schumpeterian scheme, a line of reasoning is outlined that covers influences of the German Historical School with a focus on Sombart and Weber, Marxian theory, as well as Austrian economics with a focus on Wieser. It addresses also modern theories of entrepreneurship as represented by evolutionary approaches and institutionalist strands of thought in development economics. The impact of the Youngest Historical School is to be traced even in the conceptual foundations of Schumpeterian entrepreneurship, especially in the characterisation of its institutional dimensions, accompanied by the concern with the historical specificity of development patterns as an epistemological device. Indeed, at this point, the approach to entrepreneurship may be viewed as an integral element of the Schumpeterian segment of economic sociology, perceived as the institutional analysis of capitalist development, and explicitly derived from post-Schmollerian thought. However, the arguments on entrepreneurial leadership which have been addressed also in Weber's and Sombart's expositions are rooted in Wieser's related approach, representing Austrian attempts of combining economic theory and economic sociology. Positioning the domain and objects of entrepreneurial activity in the area of industrial production is another perspective shared by the latter approaches. This hints again at the sustained impact of Marxian theory on both historist and Austrian arguments. Moreover, it has contributed to evolutionary theorising and those positions in development economics which focus on the matter of entrepreneurship in industrial innovation.

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[240] In contrast to that position, it has been suggested that Schumpeterian entrepreneurs should be encouraged, whereas Kitznerian arbitrageurs should be "taxed out of existence" as mere speculators who could damage the productive process of an economy (Legge 1996: 180). This assessment illustrates the conceptual problems that can arise from an exclusive focus on innovation which tends to ignore the need for decentral market coordination in economic development.

Figure 8.1: A typology of entrepreneurship

Dimensions	Schumpeterian Entrepreneurship	Kirznerian Entrepreneurship
Economic Function	*Disequilibrating Innovation*	*Equilibrating Coordination*
Analytical Context	*Business Cycles and Economic Development*	*Market Prices and Competition*
Analytical Content	*Historically-Specific Function in Economic Evolution*	*Universal Function in Market Processes*
Essential Activity	*Creation of Novelty*	*Discovery of Opportunities*
Essential Attributes	*Leadership Capabilities*	*Alertness and Market Knowledge*
Essential Domain	*Industrial Production*	*Market Exchange*
Objects of Activity	*Technological and Organisational Innovation*	*New Business Opportunities*
Source of Profit	*Innovation Rent*	*Price Arbitrage*
Stimulated Type of Change	*Discontinuous and Radical*	*Gradual and Incremental*
Impact on Agents and Structures	*Increasing Uncertainty by Creative Destruction*	*Decreasing Uncertainty by Market Completion*

The coordination aspect of entrepreneurship, as outlined with regard to Kirznerian positions, then mirrors a parallel and particularly overlapping array of theories, ranging from Cantillon's elaboration on entrepreneurship to the domain of modern Austrian theory. Furthermore, those approaches are reconsidered that deal with entrepreneurial coordination in economic development, including the transaction cost perspective. Yet the modern Austrian tradition excels in conceptual significance, as indicated by the role of the market process as an analytical context involving the attributes and activities of alertness and discovery. However, beyond the domain of Austrian theorising, the institutionalist arguments of Knight stand out with regard to the role of uncertainty in entrepreneurial coordination.

In order to highlight the complementarity of Schumpeterian innovation and Kirznerian coordination as entrepreneurial functions in the process of economic development, they may be viewed in the context of paradigmatic decision-making. Indeed, in an extension of the market process approach, it has been maintained that decision making under conditions of uncertainty would be shaped by paradigms, that is by cognitive frames that allow for modelling choice situations and thus promote rational behaviour. In other words, paradigms provide an institutional guide for action. Entrepreneurs denote economic agents with an unconventional perspective on exploitable opportunities, promoting economic change which is confronted by agents who follow conventional paradigms (Choi 1993: 7n). In this context, Schumpeter's notion of the circular flow would resemble a "regime of convention" that characterises an established paradigm, while innovation would be represented by the concept of "successful deviation", meant

as entrepreneurial activity beyond conventional behaviour (Choi 1993: 109n). Learning processes of economic agents, denoting a decisive component of evolutionary change, are cumulatively enabled and restricted by prior learning, that is basically by the paradigm that is already in use (Choi 1993: 48). Based on that exposition, however, it may be suggested that learning represents a paradigmatically shaped Kirznerian activity.[241] Schumpeterian entrepreneurs then represent paradigm-builders, exercising cognitive leadership in terms of a paradigmatic leadership that shapes the dominant routines and procedures for problem-solving and learning, hence outlining the range of a paradigm.

Accordingly, Schumpeterian entrepreneurship deals with drastic change by innovative leadership while Kirznerian entrepreneurship deals with moderate change by alertness in economic coordination. The formation of a paradigm then allows for coordination efforts in a relatively stable environment, involving reduced uncertainty. The revolutionising of an established paradigm is accordingly attributed to the interventions of Schumpeterian entrepreneurs. They establish new paradigms by mobilising leadership capabilities, in this case basically to be perceived as cognitive leadership. The competitive process which leads to the dominance of a paradigm is reflected by the proposition that the market process experimentally tests world views and types of imagination (Schmidtchen 1990: 133). Even in this case, lock-in effects and path dependency impede optimal outcomes in paradigm change. However, this perspective on Schumpeterian and Kirznerian entrepreneurship in the framework of paradigmatic decision-making may be extended to include the corresponding relationship between entrepreneurship, innovation and economic development.[242] Actually, the notion of paradigm change has been applied to technological innovation and structural change in industries and economies, although without appropriate recognition of entrepreneurship. Consequently, an analysis of institutional factors that drive entrepreneurial performance and technological innovation may take its point of departure in the conceptual recombination of entrepreneurship and technology. In this sense, essential aspects of Schumpeter's approach are regained.

[241] As a trial-and-error approach, this type of learning has been contrasted with a Schumpeterian process of "unlearning by doing", for established knowledge loses most of its inherent meaning during an innovation-related paradigm change (Dopfer 1994: 136n).

[242] In this context, the character of gradual evolution could be attributed to the sphere of minor innovations while major innovations would result in punctualist evolutionary change (Awan 1986: 38).

9 PARADIGMS IN ENTREPRENEURSHIP AND INNOVATION

9.1 RECOMBINING ENTREPRENEURSHIP AND TECHNOLOGY

The notion of innovation, as originally put forward by Schumpeter, refers to technological change in terms of new combinations of the factors of production, involving the setting up and restructuring of markets. In this context, the cases of new production processes and products are conceptually dominant. Hence it may be suggested that technology provides the substance for the Schumpeterian notion of innovation. Nonetheless, Schumpeter did not explicitly deal with the matter of technological evolution in terms of empirically grounded, differentiated concepts, although he repeatedly hinted at the systemic and generic character of particular technologies. However, the deficit of a clear-cut approach to technological evolution is even more pressing in the framework of Austrian market process theory, in which the matter of technology is treated either in terms of the abstractions of capital theory or as a specific component in a wider spectrum of economically relevant knowledge which is dispersed among economic agents. Yet the complexity of technology, denoting types of knowledge as well as the corresponding artefacts, considerably exceeds these Austrian positions on the market process. Consequently, an assessment of innovation should include both the elements of entrepreneurship and technology, aiming at the preparation of their conceptual recombination.

Technological evolution may be divided into the stages of invention, innovation and imitation or diffusion. The distinction between invention and innovation has been emphasised most prominently in Schumpeter's original theory of economic development. Invention designates an idea, a sketch or a model for a new or improved device, product, process or system. Thus one may speak of the application of a new idea to an actually existing problem, or point at the materialisation of a new idea. In the setting of capitalist market economies, innovation may be defined as the pioneering commercial application of inventions in a particular technological, institutional or organisational context. Innovation then denotes the aspect of putting these new ideas of invention to practical use by commercialisation. Imitation or diffusion comprises of the adoption of innovations. However, problems with the view of innovation as a process of well-defined stages result from the impossibility of properly allocating certain events to a particular stage. Even during the phase of imitation, the actual object of innovation may be modified by further innovative improvements. Diffusion thus may involve further innovation, principally resulting from learning by using. Moreover, invention, innovation and diffusion do not necessarily form an unidirectional sequence of stages, for imitation too may be perceived as an innovative process that is relevant for stimulating further innovations (Hall 1994: 21n).

According to Schumpeter's theory of economic development, the functional scheme of modern capitalism implies that entrepreneurs transform inventions into innovations by introducing them to the market. Still, the institutional pattern of competitive capitalism, as portrayed by Schumpeter, typically includes a separation of the carriers of invention and entrepreneurship as distinct functions, with the former defined as the technological domain of science and engineering, and the latter as the business domain of private sector entrepreneurship. An example from the era of early industrialisation may

illustrate the Schumpeterian case, namely Arkwright's pioneering activities in the British cotton industry of the late 18th century. Among other innovations, he introduced the water frame for spinning, collaborated intensely with inventors and financiers, while some of his ventures met violent resistance (Freeman and Soete 1997: 48n). At times, these functions of invention and innovation have been carried out by the same person, as illustrated by the case of Edison. At a later point, however, companies like General Electrics were able to sustain their competitive advantage by establishing professional in-house R&D facilities (Hughes 1990: 24n). The rise of the administrative organisation of large enterprises then heralded an organisational integration of invention and innovation.[243] Schumpeter even claimed that professional R&D laboratories and specialised management divisions would host a more cooperative type of entrepreneurship by establishing integrated routine operations of science, technology and production.

Indeed, viewed from a historical perspective, the institutionalisation of science-industry interactions has promoted a systematic application of science to industry. This contributed to the evolution of science-based industries like the synthetic materials industry with its characteristic in-house R&D facilities, emerging since the early 20th century (Freeman and Soete 1997: 106n).[244] In summary, R&D operations have shaped the innovation performance of firms and industries both in developed and developing economies, contributing to technological change as a driving force of economic development. Yet when assessing the economic role of R&D, it needs to be taken into consideration that this notion represents diverse activities. R&D is divided into the areas of research and development, again subdivided into basic and applied research. Basic research is positioned close to science, strategically aiming at the production of knowledge for the solution of current or future practical problems. Applied research is mission-oriented, directed primarily towards practical business-related aims like exploring uses for the findings of basic research in the product portfolio of a firm. Development then involves technical work which is directed towards producing new or improved materials, products and services, including the design and development of processes and prototypes (Hall 1994: 20n).

However, the generation of innovations need not constitute a primary objective of inventive R&D. Rosenberg suggests that these activities are mainly concerned with the improvement of already existing technologies, contributing to cost reduction and performance improvement; thus shaping the invention-innovation feedback within the firm (Rosenberg 2000: 27n). Moreover, as Cohen and Levinthal have claimed, R&D may increase the absorptive capacity of firms, that is, the ability to discover, assimilate and exploit external knowledge. The related type of learning then allows both for imitative assimilation and creative innovation (Cohen and Levinthal 1989: 569n). In addition to that, R&D laboratories may serve as intelligence units, monitoring and assessing scientific and technological developments on an international scale. This

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[243] These findings on the role of R&D in innovation are not necessarily related to firm size. Results of empirical research since the 1950s have not yet provided a well-specified picture of the innovation activities of small and large enterprises. Although small firms seem to obtain a disproportionately high share of innovations, they are not regularly more innovative than large firms. Still, indicators like large firm size and a market structure shaped by seller concentration do not necessarily imply a positive innovation performance too (Scherer 1992: 1425).

[244] In opposition to the thesis of invention becoming an anonymous social process, it has been claimed that individual inventors would continue playing a major role, despite the emergence of large enterprises with professional R&D departments (Jewkes et al. 1958: 16n). Although empirical evidence on this matter underlines the role of organised R&D, the argument against a systemic automatism in scientific invention remains conclusive.

exploration of external knowledge prepares its selective assimilation (Nelson 1990: 40n). Hence, the firm-specific pool of knowledge and skills is supported by R&D operations, strengthening organisational and technological problem-solving capabilities (Cantwell 1999: 236n). The productive segments of innovation processes actually include tangible as well as intangible inputs and outputs, reflecting the diverse types of knowledge as well as the variety of agents that are involved, with the entrepreneur excelling in investment and commercialisation. Difficulties in quantifying inputs and outputs arise from their qualitative dimension. This empirical problem may be illustrated by the case of the subjective and tacit components of knowledge, excelling as an empirical factor in the assessment both of R&D and the commercialisation of its results (Freeman and Soete 1997: 7n).

Abstracting from these aspects, it has become a common strategy for the neoclassical representation of R&D and innovation to assume that R&D as an inventive activity resembles an ordinary production process in which well-defined inputs are transformed to a well-defined output. A variant of this argumentation on knowledge production was put forward by Machlup, who pointed at the problems of defining a production function for inventions that could depict the transformation of inventive labour as an input for the production of inventions. These were approached as a conventional economic good. This should imply that a measurable relationship between input and output in the production of invention exists as an empirical phenomenon (Machlup 1962: 152n). Machlup's position then referred to the emergence of systematic, mechanised, and routinised procedures of invention, allowing for the application of probability calculus to an assessment of technological change even on the level of single enterprises. This "invention industry" was said to perform with a regularity that would overshadow the impact of chance discoveries (Machlup 1962: 153n). Machlup thus emphasised the supply of inventions as the crucial factor in economic development, emphasising its responsiveness to economic incentives.

A decidedly more demand-oriented position has been addressed by Schmookler, who rejected the thesis that advances in inventive knowledge would determine innovation in terms of an input-output system. Instead, the role of demand factors in inducing invention was taken to the fore, based on a Smithian argument which claimed that the amount of invention would be governed by the extent of the market (Schmookler 1966: 104n). This orientation, and its challenge of Schumpeterian positions, is reflected by a definition of invention as a new combination of pre-existing knowledge which satisfies wants, that is, as a creative response to already existing and articulated wants (Schmookler 1966: 136). Consequently, the demand for invention would resemble the demand for conventional economic goods, subject to the same logic of resource allocation according to consumer preferences. Therefore, Schmookler claimed also that technological change should be perceived as an endogenous variable of the economic process. The production of inventions should be understood in terms of the same economic logic of expected returns as any production of goods for certain markets (Schmookler 1966: 208n).

Assessed critically, both of these positions neglect essential features of innovation, as perceived in Schumpeterian terms, namely the characteristics of novelty and uncertainty, based on the subject of entrepreneurship. Approaching these characteristics implies, first of all, to note that types of innovation may be distinguished according to the specific degree of uncertainty they are related to. Any major innovation is accompanied by radical uncertainty, defined by Knight with regard to a future state of affairs that can not be calculated with reference to a certain probability distribution. This corresponds with the unpredictability of novelty in expanding the set of already known

technological opportunities. Still, both the degrees of novelty and uncertainty differ markedly among innovations. Figure 9.1 depicts a continuum of varieties that ranges from the sphere of fundamental research with true uncertainty to minor technological improvements related with no relevant degree of uncertainty at all. As the calculation of risk becomes more plausible, the less radical and discontinuous is the type of change which is associated with particular innovations.

Figure 9.1: Uncertainty and types of innovation

Degree of Uncertainty	**Type of Innovation**
True uncertainty	*Fundamental research*
	Fundamental innovation
Very high degree of uncertainty	*Radical product innovation*
	Radical process innovation outside the firm
High degree of uncertainty	*Major production innovation*
	Radical process innovation in own establishment or system
Moderate uncertainty	*New "generations" of established products*
Little uncertainty	*Licensed innovation*
	Imitation of product innovation
	Modification of products and processes
	Early adoption of established processes
Very little uncertainty	*New "model"*
	Product differentiation
	Agency for established product innovation
	Late adoption of established process innovation and franchised operations in own establishment
	Minor technical improvements

Source: adapted from Freeman and Soete (1997: 244, Table 10.1).

However, such a classification according to the degree of uncertainty does not allow for an assessment of market structures and technological routines. In accordance with that proposition, the impact of innovations on supply-side factors of production and technology as well as on demand-side factors of markets and customers has been viewed in combination with an exploration of linkages and competencies in the innovation process (Abernathy and Clark 1985: 4n). This perspective allows for a typology of innovations that mirrors the corresponding potential for the restructuring of firms and industries. Architectural innovations are closest to the Schumpeterian notion of creative destruction, for they include the creation of new industries, new markets, and new products. They establish new technologies and market agendas, as exemplified by the Ford "Model T" automobile that was accompanied by further innovations of mass-production, ranging from assembly lines to corporate wage policies. Revolutionary innovations disrupt established patterns of competence and the productive use of technology. Still, established market structures remain intact and are used as an innovation platform, as demonstrated by the innovation of the jet aircraft replacing the propeller-driven aircraft which left the passenger aeroplane market intact as far as

customer needs were concerned. Niche creation innovations use established technology to create markets and by doing so to explore the potential of new linkages and modes of interaction. An example is the case of electronic devices like portable audio players. Regular innovations then represent gradual change and incremental improvement as common types of innovation in which the already established technologies and competencies are applied to existing markets and linkage structures (Abernathy and Clark 1985: 7n).

It is certainly misleading to think of innovation as exclusively driven either by science- or demand-induced impulses. Indeed, both sides are regularly found to interact.[245] A more appropriate comparison would have to address entrepreneurial activities on the supply side of markets, instead of focussing on the science-technology-innovation mechanism that constitutes the science-push perspective on innovation and economic development. Moreover, it would emphasise varieties of innovation and their technological as well as institutional characteristics, as related to patterns of consumer and user demand. Indeed, it has been proposed that Schumpeter's supply-side approach to the entrepreneurial commercialisation of inventions grasps the essence of major innovations; whereas, minor innovations that induce gradual change, basically referring to product innovations, are better described by Schmookler's demand-side approach of inventions and innovations, basically to be interpreted as a part of Schumpeter's secondary wave (Freeman et al: 1982: 25n).

In a further specification of that position, Freeman has presented various types of innovation, perceived as engines of the restructuring of industries and economies. The classification follows the basic criterion of combining the nature of change, as induced by innovation, with the range of its impact on the economic system. Incremental innovation denotes the continual and incremental improvements of products, processes or organisational constellations, usually linked to market demand and user needs. Radical innovation denotes discontinuous change of products and processes, representing a typical case in the Schumpeterian approach to innovation. The diffusion of radical innovations requires major institutional and technological changes, for they evolve out of established structures. New technology systems denote interrelated clusters of incremental and radical innovations, based on systemic relationships. The techno-economic paradigm, as the most comprehensive type of innovative change, then resembles Schumpeter's notion of the long waves of economic development, that is, the Kondratieff cycles that exhibit historically individual technological and institutional features. The decisive characteristic of this paradigmatic mode of change is its impact on the whole economy, its diverse industries and sectors, as well as its institutional and organisational foundations that make up a pattern of development. It generates externalities that allow for a stabilisation in terms of path dependent development (Freeman 1992: 132n).

Furthermore, with regard to the nature of technological change, the conceptual choice is not between gradualism and saltationism. Instead, an integration of both aspects is necessary, as they shape the corresponding process in specific phases and on distinct

[245] These discussions have been applied to the domain of R&D. In this case, science-push approaches maintain that a linear relationship between scientific input and innovation output of R&D is to be observed. This distinction has been criticised for neglecting the complexity of feedback interactions in R&D, as highlighted in the "chain-linked" approach in which the notion of feedback mechanisms, perceived as learning processes, is directed against the notion of unidirectional flows of resources. Accordingly, it is argued that science may be relevant both as a supplier and receiver of research stimuli (Kline and Rosenberg 1986: 289n). However, it has been criticised that this model abstracts from institutional and organisational dimensions of innovation, hence it fails to account for technology, institutions and industry (Hall 1994: 26n).

levels of evolution. Accordingly, Freeman has claimed that an analysis of innovation needs to account both for gradually incremental and discontinuously radical types of change. This point of view seems to contradict the emphasis on clusters of innovation and discontinuous change in Schumpeter's approach, even though it also acknowledges principles of continuity in technological evolution, at least when viewed from a macroscopic perspective. However, in accordance with the criticism that neither supply-push nor demand-pull theories would leave adequate conceptual space for the matter of entrepreneurship, Freeman goes on to emphasise that the commercialisation of innovations necessarily requires entrepreneurial performance, regardless of the nature of innovation, firm size or identities of inventor and entrepreneurial innovator (Freeman 1992: 80). Entrepreneurship and technological innovation thus should be recombined as analytical building blocks of theorising on economic change. For instance, with regard to the relationship of uncertainty in technology and market knowledge, a distinction has been proposed that introduces certain types of entrepreneurship to the domain of technology management. Entrepreneurship of the Schumpeterian and Kirznerian types, among others, then becomes a relevant category in coping with uncertainty and knowledge (Kyläheiko and Miettinen 1995: 53n).

In view of that, it is necessary to emphasise once more that the matter of innovation should not be reduced to the exclusive impact of R&D activities. Tacit and informal dimensions of innovation also need to be considered. They are especially relevant in small enterprises which operate in traditional industries, where informal learning procedures tend to dominate the formation of skills and knowledge as prerequisites of innovation.[246] In summary, the assessment holds that technological change is highly sector- and industry-specific regarding competitive opportunities and the appropriability of returns. Technological change is characterised by a partial tacitness of knowledge and an inherent variety of search procedures, to be perceived in the context of uncertainty and irreversibility. These characteristics shape market structures and perpetuate the innovation-related asymmetry and variety among firms, industries and even countries (Dosi and Orsenigo 1988: 15n). Still, in addition to that, the corresponding institutional aspects of coordination and economic order suggest that search procedures will also be shaped by institutional regularities, reflecting paradigmatic qualities. At this point, thus, the concept of the technological paradigm provides decisive insights for a conceptual recombination of entrepreneurship and technology.

9.2 PARADIGMS AND TRAJECTORIES

The matter of search and discovery points at the rationale of technological research. From a historical perspective, technology was seen as an art, later as a craft-based activity. This type of technological consciousness may still be found in the craft-based production facilities of small enterprises. In contrast to that, modern technology is based on rationalisation and scientific rigor, which implies a shift of emphasis from the tacit knowledge of the craftsmen to the allegedly objective knowledge of scientists and

[246] It is noteworthy, that innovation indicators like granted patents, that is indicators that are most likely related to R&D operations, grasp the actual degree of novelty in many product and process innovations only marginally (Grupp 1998: 149n). This may result in a systematic overestimation of R&D in accounting for the sources of technological change.

engineers.[247] Technological codification is part of the comprehensive process of rationalisation, as exhaustively analysed in studies of the German Historical School, just to mention Sombart's approach to the role of technology in diverse economic systems. It may be asked, however, whether innovation activities, based on distinct types of knowledge, follow some kind of progress function. Indeed, the matter of progress in knowledge is constitutive for the interrelated spheres of science and technology where the notions of paradigms and trajectories have evolved as prime concepts. Structural similarities are related to the role of innovation in scientific progress, as the pattern of a logistical diffusion of new scientific knowledge may be accompanied by a competing out of alternatives (Brouwer 1991: 146n). Consequently, concepts for dealing with scientific progress, originally formulated in the domain of methodology, have been transferred to the theory of technological innovation, then contributing to the concept of the technological paradigm.

Discussions in economic methodology usually take issue with Popper's approach of critical rationalism. It defines science as a body of synthetic propositions about the real world that can be falsified by empirical observation. Science is characterised by the method of formulating and testing propositions and not by its subject matter or by claims regarding the certainty of knowledge. Scientific progress follows a mode of trial and error; hence, theories that have been falsified are stepwise eliminated (Blaug 1980: 10n). According to Loasby, this view on progress in knowledge, that is scientific progress, as an experimental process of trial and error, conjecture and refutation, which is neither predetermined nor foreseeable, resembles the market process approach with its experimental efforts of coordinating individual plans in a market setting (Loasby 1983: 105). However, Popper's approach has been repeatedly contested, especially by emphasising the role of ideological factors and special interests in scientific progress, as well as by pinpointing the matter of novelty; again aspects that have been put forward against the rational underpinnings of market process theory too.

As an outstanding alternative to critical rationalism, Kuhn's theory of "the structure of scientific revolutions" is based on the notions of normal science, denoting problem-solving activity in the context of an orthodox theoretical framework, and paradigm change, that is, the overthrow of one framework by another in consequence of repeated refutations and observable anomalies. The history of science is marked by long periods of normal science which are then interrupted by scientific revolutions (Kuhn 1970: 5n). An example from astronomy, is the replacement of Ptolemaic theory by Copernican heliocentric theory. According to Kuhn, then, the practitioners of normal science follow a commonly shared worldview, denoted as a scientific paradigm that demarcates the area of relevant problems and solutions, thus providing models from which evolve traditions of scientific research (Kuhn 1970: 10). This aspect of scientific paradigms has been reiterated by the notion of the disciplinary matrix that shapes the research activities of scientific communities. It is disciplinary because it refers to the common possession of the practitioners of a particular scientific discipline, yet the matrix form is due to its composition of ordered elements of various sorts, requiring further specification (Kuhn 1970: 181n). Normal science is thus understood as a self-sustaining, cumulative process of puzzle solving in the context of an analytical framework that is shared by the scientific community.

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[247] The origins of modern science and technology as distinct areas in the progress of knowledge have been associated with the evolution of a "Baconian Age" since the late 16th century, relating the advance of knowledge with the material, intellectual as well as moral progress of humanity, reflecting Enlightenment philosophy (Sagasti 1997: 1561n).

The proliferation of theories and the appearance of methodological controversies herald the breakdown of normal science, as soon as a new scientific paradigm offers solutions to neglected and unresolved puzzles. This process is based on unanticipated novelty of facts and theory, that is principally discovery and invention. The new framework is prepared to become the new dominant scientific paradigm, as it is already part of the overlapping and interpenetrating paradigms that mark scientific revolutions (Kuhn 1970: 52n). Paradigm changes, however, may follow normative judgements. Thus the course of scientific progress is not determined by purely rational arguments but also by arguments that contain non-rational elements beyond logical proof (Kuhn 1970: 158n). Moreover, the matter of novelty in paradigm change is implicitly related to an argument of scientific entrepreneurship:

> "Almost always the men who achieve these fundamental inventions of a new paradigm have been either young or very new to the field whose paradigm they change. And perhaps that point need not have been made explicit, for obviously these are the men who, being little committed by prior practice to the traditional rules or normal science, are particularly likely to see that those rules no longer define a playable game and to conceive another set that can replace them" (Kuhn 1970: 90).

Based on that argument, a comparison of Kuhn and Schumpeter may yield further results concerning the combination of entrepreneurship and progress in knowledge. Blaug, for instance, equates Kuhn's paradigm with Schumpeter's vision (Blaug 1973: 10). Yet this is inadequate, for the Schumpeterian approach would combine vision, theory and the corresponding schools of thought, coping with paradigm change as an institutional process. Schumpeterian entrepreneurial leaders are in need of resources and organisations to command; sensed either a school of thought in science, a political party in politics, or a firm in economic life. However, the constitutive distinction between Schumpeter's concepts of routine and growth in the circular flow versus novelty and development in economic evolution is of course also present in Kuhn's theory, translated into a distinction between the routines of normal science and the leaps of paradigm change (Brouwer 1991: 146n). A crucial conceptual difference, in this case, is constituted by Schumpeter's emphasis on the neighbourhoods of equilibrium as the economic environment required for pioneering entrepreneurial intervention, whereas Kuhn refers to the manifest crisis of an established paradigm as an indicator of progressing change.

This paradigm scheme has been applied to debates on the specific nature of technological change. Relevant segments of these debates have usually taken on the approach of neoclassical production functions with its assumption that a common state of knowledge may cover the whole array of factor combinations, as depicted by this type of function. The notion of "technological guidepost" provides an alternative to this concept. It should grasp the phenomenon of gradually evolving dominant designs, based on the observation that the majority of technological innovations is concerned with the improvement of already established technologies. Technological change, perceived as an evolutionary, cumulative and systemic process, then results from minor innovations which reflect the local character of knowledge and learning (Sahal 1981: 33n). In this context, and with reference to Kuhn's concept of paradigmatic change, Dosi has claimed that a theoretical explanation of innovation should cover the case of incremental innovations, but first of all it should deal with an explanation of technological "breakthroughs" (Dosi 1982: 150).

In focussing on major innovations while acknowledging the role of incremental improvements, both the demand- and supply-side views of innovation have been

critically assessed. The market-centred view of demand-induced innovation is criticised for the thesis that a possibility of knowing the direction in which the market is pulling technological change exists, even before specific inventions have taken place. Markets are said to exhibit the capacity for signalling directions of inventive activity, regardless of uncertainty in innovation. Accordingly, the demand-pull approach operates with given choice sets, reducing the innovation process to an adaptive technological response to changing market data (Dosi 1982: 149n). The supply-side view of technological change then suggests that the empirically observable increase of scientific inputs in the process of innovation, as mirrored by the expansion of R&D expenditures, justifies the notion of "science-push". This approach still needs to avoid a linear scheme of science-technology-production as particular stages of the innovation processes, which actually resembles a complex feedback-structure between these components and the socio-economic environment (Dosi 1982: 151).

A basic thesis of Dosis's concept then suggests that the qualities of uncertainty and cumulativeness that are associated with technological change allow for a perception of innovation as continuous search and selection. It does not advance merely as a random process on the set of technological opportunities (Dosi 1982: 158n). Instead, search and selection procedures are shaped by a technological paradigm, broadly defined as "an 'outlook', a set of procedures, a definition of the 'relevant' problems and of the specific knowledge related to their solution" (Dosi 1982: 148). Hence, it is a pattern of solutions for selected technological problems, based on principles that are derived from natural sciences and material technologies (Dosi 1982: 152). The technological paradigm exhibits both the dimensions of technological artefacts and of heuristics that define the direction of research. Within the range of a technological paradigm, a durable approach to the design of technological artefacts and the solution of technological problems becomes available for the community of scientific and technological practitioners. Under the influence of the dominant paradigm, thus, further innovation will exhibit a more gradual and incremental character. Each technological paradigm is said to define its own pattern of "progress", based on technological and economic trade-offs. Technologies then evolve in the shape of "technological trajectories" which define imperatives that make certain advances in technology seem to be without alternative. A technological trajectory mirrors the direction of advance within a technological paradigm (Dosi 1982: 148). In other words, these trajectories refer to normal problem-solving activity on the ground of a technological paradigm, representing a "cluster of possible technological directions" with boundaries defined by the paradigm (Dosi 1982: 152n).

The notion of technological paradigm differs from a Hayekian treatment of decentral knowledge coordination on markets by pinpointing the directed components of technological change, based on cumulativeness and path dependence. Due to their role in the reduction of behavioural complexity, paradigms rather resemble the role of institutions for economic behaviour. Institutions reduce uncertainty by means of their behaviour-shaping impact, promoting regularity and reliability, while they contribute to the coordination of economic agents who are confronted with imperfect information (Dosi and Orsenigo 1988: 19). Accordingly, economic agents respond to changes in relative prices and demand conditions within the boundaries of a technological paradigm. The paradigm provides coherent structures for innovation, whereas the market mechanism provides a decisive stimulation for technological change in phases of paradigm change (Dosi and Orsenigo 1988: 16n). However, due to the essential uncertainty that is associated with the assessment of the economic outcome of

innovation, an ex ante comparison or even ranking of technological paradigms remains impossible.
The selection of a certain paradigm at an initial stage of the evolution of a technology, and the related industry, will mirror selective influences of the market mechanism only to a limited degree. Search and discovery procedures are accompanied by the selective impact of special interest groups and political forces. However, the role of markets as a selection environment may increase with the degree of technological commodification. When the final good is commercialised, markets even play the decisive role in an ex post selection environment (Dosi 1982: 155n). Coping with technological paradigms and the matter of technology assessment from an Austrian point of view would point at the matter of pattern prediction, based on Hayek's notion of organised complexity as a characteristic structure which is derived from the properties of its elements, the frequency of their occurrence, and the connection between them. Confronted with the impossibility of perfect knowledge, pattern prediction would become feasible as the prediction of the general attributes of certain structures without specific statements on their elements (Hayek 1978c: 26n). Consequently, this type of pattern prediction does not allow for a selection of technologies as far as choices between alternative technological paradigms are concerned.
From a Schumpeterian perspective, any prediction of technological change would be limited by the entrepreneurial capacity of creative response, which promotes the unforeseeable nature of economic development. A reconsideration of entrepreneurship in the context of technological innovation then needs to account for those agents who promote paradigm change. Indeed, regarding the selective function of markets, the existence of a variety of entrepreneurial "risk-taking actors" who take part in the trial-and-error search process for new technologies is acknowledged (Dosi 1982: 156). These entrepreneurial risk-takers promote "extraordinary" search procedures when a new technological paradigm is set up, usually inspired by scientific advances or major technological as well as economic difficulties in exploiting an existing paradigm. This contrasts with the case of data changes as sources of technological change along an established trajectory, based on ordinary search procedures that resemble "normal" technological performance in Kuhn's terms. Extraordinary search procedures, coping with new opportunities, have been perceived as entrepreneurial aspects of paradigmatic technological change (Dosi 1982: 157).
A similar proposition had been put forward by Gilfillan, who pioneered the theory of technological progress as an invention-driven cumulative process. He claimed that revolutionary inventions were usually made by industrial outsiders, whereas perfecting inventions were promoted by insiders (Gilfillan 1935/1970: 11n).[248] This insider-outsider scheme may be transferred to the differentiation of innovating, paradigm-establishing Schumpeterian entrepreneurs and coordinating, paradigm-exploring Kirznerian entrepreneurs. Accordingly, the distinction between establishing a new paradigm and searching along an already defined paradigm has been grasped by styling diverse stages of the innovation process. The first stage of industrial emergence resembles a mix of economic and socio-political incentives with a focus on knowledge-

[248] In the framework of social constructivism, Hughes has elaborated on the notion of "system-builders", who create technological systems, shaped by the social environment, as exemplified by the case of Edison (Hughes 1989: 52n). Regarding their entrepreneurial function, however, the distinction of invention and entrepreneurship remains vague. However, supposedly overstating the role of collective action in innovation, David maintains that innovation is less a result of entrepreneurship based on distinct institutional characteristics, but rather a matter of brief individual interventions and events during specific periods that allow for path dependent technological evolution (David 1991: 106n).

generating organisations and entrepreneurial risk-takers. The second stage of industrial maturity combines technological change with the routine of the economic process. Within an established technological paradigm, "heroic entrepreneurship" becomes obsolescent, as it is internalised by firms (Dosi 1982: 157n).[249]
Consequently, it has been examined whether certain organisational forms correspond with distinct phases of paradigm change. In this context, Nooteboom has presented a scheme of innovation stages and industrial organisation that resembles the distinction of Schumpeterian and Kirznerian entrepreneurship. In the stage of an innovative commercialisation of inventions, small firms and relatively autonomous business units will exhibit advantages of motivation and opportunity, promoting the break with established routines and practices. Due to the variety of search strategies, advantages of small enterprises prevail in the stage of consolidation, that is, during the search for a dominant paradigm. The stage of generalisation, accompanying the establishment of the dominant design, then witnesses the need for integrated structures in large organisations, as coordination tends to be increasingly based on codified knowledge. Subsequently, a stage of differentiation evolves, in which the dominant design is adapted to diverse contexts, fuelling a diversification of structures that brings about a structural variety which resembles the initial stage of the process (Nooteboom 1999: 143n). Implicitly, Schumpeterian entrepreneurship would allow for disintegration, whereas Kirznerian entrepreneurship might promote coordination in integrated as well as differentiated structures. However, innovating and coordinating types of entrepreneurship co-exist at all times, although not necessarily in the organisational forms which may be derived from these ideal typical categories. In the case of vertical relationships, for example, the introduction of a new production process may require the cooperation of specialised suppliers. In this case, Schumpeterian innovation may coincide with Kirznerian coordination in the discovery, establishment and management of new supply chains.[250]
Furthermore, in order to proceed with evolutionary histories of certain industries, Winter has presented the notion of technological regimes, reflecting the distinction of an early and a late Schumpeterian approach to innovation. The "entrepreneurial regime" denotes a situation in which entrepreneurial initiative is exercised by market entrants, whereas in the "routinised regime" this initiative is with established firms, hence promoting incremental change (Winter 1984: 293n). Accordingly, Dosi has argued that

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[249] The product cycle schema has been invoked as an illustration of these developments. Andersen distinguishes between pioneers who introduce a new product, followed by an entrepreneurial market-maker who establishes a corresponding market, as product-characteristics become a prominent feature of innovation. The rationalisation of production proceeds, as a new paradigm is established and a related product design becomes dominant. The standardisation of communication finally signals the maturity of an industry (Andersen 1994: 57n).

[250] A case in point is Teece's transaction cost approach to innovation, highlighting modes of governance, coordination and organisational integration during the innovation process. The focus is on problems of appropriability, that is the distribution of profit shares captured by innovators, imitators, suppliers and customers. The appropriability regime, based on legal instruments like patents, and the nature of technology, denoting the degrees of codification and the process-character of technologies, both shape the competitive position of innovating firms. When innovations reach a phase of standardisation, related to the formation of a dominant paradigm, imitation may become easier, while the rate of process innovation decreases compared with the rate of product innovations (Teece 1986: 287n). Complementary assets like manufacturing experience are usually needed for the commercialisation of innovations; their potential for dependence is derived from their degree of specialisation. Integration and contractual solutions then provide alternatives in coping with complementary assets. In a constellation of a weak appropriability regime and specialised complementary assets, for instance, the innovating firm will choose the strategy of integration, in this case reflecting the organisational advantages of large firms (Teece 1986: 296n).

the evolutionary approach of Nelson and Winter, underlying this regime concept, succeeds primarily regarding an explanation of innovation in the market phase of oligopolistic maturity, conditioned by an established paradigm (Dosi 1982: 160). Yet these conditions do not allow for entrepreneurial change in a Schumpeterian sense, which would include the setting up of new paradigms and trajectories, involving persisting opportunities for market entry. In the context of the paradigm concept, industry-specific regimes then may overlap with paradigm-creating and paradigm-coordinating entrepreneurship. Moreover, these regimes may highlight industry-specific advantages of firm size. In this context, Audretsch notes that a high degree of conformity in the entrepreneurial evaluation of new knowledge, typical in the routinised regime, may impede the setting up of new firms; whereas, the entrepreneurial regime is marked by heterogeneous assessments, hence by a high degree of market entry (Audretsch 1994: 321n).
However, the paradigm concept involves search and discovery procedures which are not necessarily related to industry-specific factors like firm size and market regime. Indeed, the institutional and organisational domain of the carriers of entrepreneurship may reach beyond the confines of firms and industries, and their particular histories; hinting instead at the historical range of a type of technological and institutional dynamism that is captured by invoking Schumpeter's approach to Kondratieff cycles. Actually, these cycles have been set in relation with the notion of technological paradigms and trajectories by pointing at the generation and diffusion of new technological opportunities, driving the cyclical pattern of economic development (Dosi 1982: 160). Consequently, the matter of entrepreneurship and technological innovation should be examined with regard to the neo-Schumpeterian notion of the "techno-economic paradigm", perceived as a modification of the micro-oriented paradigm framework, yet applying its concerns to the corresponding macro-perspective on national or regional development patterns.

9.3 THE PARADIGMATIC CHARACTER OF ENTREPRENEURSHIP

It has been suggested that Dosi's approach to technological paradigms and trajectories is designed to offer microfoundations of growth and development patterns (Cimoli and Dosi 1995: 245n). Indeed, a macro-perspective on the development process would be perceived as a modification of the paradigm perspective, well captured by the concept of the "techno-economic paradigm" (Andersen 1994: 46). This notion, originally presented by Perez in a discussion of the technological foundations of business cycle dynamics, focuses on the institutional dimensions of technological change in a context of structural change and macroeconomic instability (Perez 1983: 357n). It has become a constitutive component of the neo-Schumpeterian research agenda, stressing the interdependence of technological innovation and the institutional configuration of an economy. Due to the perception of technologies, industries and institutions as interrelated components of an economic system, the neo-Schumpeterian approach modifies the Schumpeterian concept of innovation in favour of a more systemic perspective. Still, it retains Schumpeter's concern with the technological and institutional sources of economic development.
Schumpeter's position, however, is criticised for neglecting the empirical fact that innovations exhibit varying degrees of novelty, thus exercising pressure on an established production structure with specific grades of intensity. Furthermore, according to the neo-Schumpeterian position, Schumpeter does not offer a convincing

explanation of innovation clusters and their cumulative effects in various phases of the business cycle. Instead of highlighting epochal innovations, it is claimed that the systemic generation and diffusion of technologies should be explored under consideration of infrastructural and institutional adaptations (Freeman and Soete 1997: 20n). This argument is also directed against theories of a depression-triggered "bunching" of basic innovations and the underlying argument that depression promotes the carrying out of high-risk ventures. This thesis, originally put forward by Mensch, has been criticised for its empirical insignificance as far as the clustering of major innovations in depression phases is concerned, paralleled by a conceptual underestimation of the innovative impact of diffusion (Freeman and Soete 1982: 63).[251] Thus the neo-Schumpeterian perspective relates the phenomenon of Kondratieff cycles with a systemic view on those institutional and technological patterns that constitute a techno-economic paradigm.

The notion of the techno-economic paradigm, originally also denoted as a particular "technological style", has been defined as a "sort of paradigm for the most efficient organisation of production, i.e. the main form and direction along which productivity growth takes place within and across firms, industries and countries" (Perez 1983: 361). This type of macro-paradigm is constituted by a comprehensive sample of technological, institutional and organisational components, like the organisation of production and other business operations, the skill profile of the work force, actual trends in the generation and diffusion of radical as well as incremental innovations, patterns of investment, savings and consumption, the spatial structure of production, as well as types of innovators and entrepreneurs (Freeman and Perez 1988: 59). This array of characteristics resembles of course Schumpeter's perception of Kondratieff cycles as historical individuals. Nonetheless, the nature of cyclical change differs from Schumpeter's position, among others, in an emphasis on the gradual emergence of the paradigm. A new techno-economic paradigm emerges in the peak phase of a long wave, when the preceding paradigm reaches the inherent limits of its growth and development potential. It emerges gradually as a new "ideal type" of productive organisation, taking advantage of certain key factors of production which are becoming ever more visible in the cost structure of firms and industries. Its diffusion brings about a radical change of engineering and managerial practice, replacing the economic pattern of the established paradigm, hence fuelling the complete restructuring of the productive system (Freeman and Perez 1988: 58).

A "structural crisis" of the economy occurs as the new techno-economic paradigm diffuses all over the techno-economic system, leading to a mismatch of new technologies and the persisting institutional framework of the preceding paradigm. This situation promotes a process of search, experimentation and adaptation both on the national and international level. The process of paradigm change, as a major historical discontinuity, then includes the establishment of new modes of regulation that contribute to the fine-tuning of technologies, organisations and institutional forms, thus promoting specific patterns of economic growth and development. A temporarily stable configuration is established by the conflict-ridden adaptation of the institutional set-up to the requirements of the new techno-economic paradigm (Freeman and Perez 1988:

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[251] Mensch argued that depression would represent a crisis of established technologies and industries due to vanishing investment opportunities, reflecting a "technological stalemate", thus triggering investment in new technologies which should be supported by non-interventionist policy measures (Mensch 1975: 16n). However, in contrast to the Schumpeterian approach, Mensch rejected the notion of Kondratieff cycles in favour of a schematic sequence of S-shaped logistical curves that resembled a market phases scheme. This procedures should allow for focussing on stagnation phenomena (Mensch 1975: 84n).

58n). However, an identification of this type of macro-paradigm may allow for prefiguring certain characteristics of structural change, supposedly including opportunities for the design of related policy strategies, although institutional and organisational adaptation is not technologically determined, but subject to trial and error (Perez 1983: 360).[252]

These policy proposals have provoked the claim that the neo-Schumpeterian perspective resembles Keynesian interventionism, at least in comparison with non-interventionist positions held by Schumpeter (Brouwer 1991: 140n). A specific economic order may emerge as an outcome of these institutional modes of regulating economic change, thus contributing to the stabilisation of the economic process (Dosi and Orsenigo 1988: 31n). The resulting upswing of the corresponding long wave is carried by positive investment expectations in Keynesian terms, while the demand-side of the economic process is stabilised as long as the development potential of the paradigm is exploited (Freeman and Soete 1988: 59). Consequently, Kondratieff waves are interpreted as economic expressions of the evolution of the economic, social and institutional system, with the latter subjected to a considerable degree of inertia, thus responding only delayed to the impulse of technological change (Perez 1983: 360). This adaptive relationship of technology and institutions then resembles the Marxian scheme of the mode of production, in which the shape of the productive forces may exhibit a mismatch with the social relations of production, thus technological change may breed social and institutional change (Chesnais 1986: 191n).[253]

On an international scale, the resulting process of economic development is characterised by the technological leadership of those countries which are best equipped for meeting the infrastructural and institutional requirements imposed by the techno-economic paradigm. Rapid development and catch-up growth of less-developed economies becomes feasible due to the opportunities for leapfrogging certain development stages, at least in terms of providing infrastructural conditions that facilitate learning strategies which are adapted to the conditions of technology assimilation. These dimensions of institutional change are essential for coping with paradigm changes and thus for defining the position of a country in the international division of labour. Outstanding examples of that specific dynamism are late industrialisers like Germany in the 19th century and Japan in the 20th century (Freeman 1995a: 5n).

Furthermore, according to the neo-Schumpeterian approach, capitalist economic development has currently reached a transformation phase from a Fordist techno-

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[252] Tylecote has suggested that certain positive and negative feedback processes stimulate these adaptations, contributing to the long wave pattern either as promoting or impeding factors. Major feedback factors are the monetary system, population dynamics, as well as structural inequalities between core and periphery economies in the international division of labour (Tylecote 1991: 27n).

[253] The neo-Schumpeterian reference to the role of political and social conflicts in the development of the long wave pattern also resembles Marxist positions. In explaining the dynamism of Kondratieff cycles, Mandel, for instance, pointed to the twin disparity between the production and the realisation of surplus value, as well as between the realisation of surplus value and capital accumulation, which would lead to cyclical crises of overproduction (Mandel 1972: 101n). Beyond the confines of Marxist theory, the theory of "*régulation*", which analyses the institutional determinants of the interplay of crises and stabilisation in capitalist development, has exercised a major influence on the neo-Schumpeterian concept of interdependent technological and institutional change. A "mode of regulation" describes rules and behavioural forms which promote socio-economic coherence. A structural crisis then designates „any episode during which the very functioning of regulation comes into contradiction with existing institutional forms, which are then abandoned, destroyed or bypassed" (Boyer 1988: 76). Technological change represents a decisive aspect of these crises, borne out of social conflicts underlying the production process.

economic paradigm, based on energy-intensive industrial mass-production, to a more flexible, network oriented and information intensive "ICT paradigm", based on information and communication technologies (Freeman 1994: 206). This is in agreement with a slightly modified version of Schumpeter's original scheme of Kondratieff cycles, depicting a mechanisation Kondratieff from the 1770s to the 1840s, a Kondratieff of steam power and railways from the 1840s to the 1890s, an electrical and heavy engineering Kondratieff from the 1890s to the 1940s, a Fordist Kondratieff from the 1940s to the 1990s, and finally an emerging ICT Kondratieff (Freeman 1987a: 68n).[254] In the case of the recent paradigm change, East Asian late industrialisers have mastered the challenges of catching up by means of a well adapted institutional and industrial structure, whereas Japan could sustain its economic lead in the Asia-Pacific region, contrasting with the stagnation experienced by most newly industrialising economies in Latin America (Freeman 1996: 160n).

Each paradigm exhibits specific institutional and organisational features that include entrepreneurial profiles (Freeman 1987a: 68n). However, a systematic account of the role of entrepreneurship in relation with the emergence and diffusion of a techno-economic paradigm has been neglected, although it could provide further insights for the matter of innovation and coordination in the process of paradigm change. A point of departure for a related argumentation may hint at Machlup's differentiation of agenda-reducing inventions, that contribute to the net reduction of unsolved technological problems, and agenda-increasing inventions, which generate a net increase of areas for discovery during the solution process. The latter type is related to basic and fundamental inventions, although new problems may also emerge from inventions with a less disruptive character. Still, fundamental inventions stand out in shaping the production function for invention, particularly by redefining the input-output ratio (Machlup 1962: 161n). Although the production function framework may serve primarily illustrative purposes in the present context, Machlup's position may be related with the paradigm notion and the entrepreneurial functions of innovation and coordination. In general terms, Schumpeterian entrepreneurs would represent paradigm-builders, exercising paradigmatic leadership in shaping problem-solving routines and learning conditions. In this case, learning represents a Kirznerian trial-and-error process which contrasts with the Schumpeterian creative destruction of the knowledge base of the economic process. Thus, in delineating the opportunity space for the decision-making of economic agents, paradigms allow for coordination in a structured context with reduced uncertainty. Correspondingly, Kirznerian entrepreneurship deals with alert coordination in gradual change based on minor innovations, while Schumpeterian entrepreneurship deals with innovative leadership in rapid change based on major innovations.[255]

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[254] Maddison has criticised the Schumpeterian business cycle scheme, including its reference to long wave patterns, for ill-conceived empirical foundations, minor quality of underlying data sets, and unresolved problems in approaching the matter of long wave periodicity (Maddison 1991: 110n). His characterisation of historical growth phases still resembles the institutional aspects of Schumpeter's approach. Maddison pictures the first phase from 1870 to 1913 as the liberal phase of modern capitalism, followed by a neo-mercantilist phase between 1913 and 1950, which is again followed by the rise and decline of the "golden age" of welfare state capitalism until the 1970s (Maddison 1991: 120n).

[255] Similar arguments have been presented in the context of an evolutionary account of behavioural aspects in economic evolution. Allen has introduced the notion of "stochasts" who drive competition and innovation by discovery, whereas "cartesians" stabilise the economic system, orienting their performance at established routines (Allen 1988: 116n). Although this differentiation is closer to Schumpeter's distinction of entrepreneurs and routine agents, it still overlooks differences between creation and discovery as distinct facets of entrepreneurship.

All of these arguments have been applied to the paradigmatic quality of certain technologies. Still, the relationship of entrepreneurship and economic change may be applied also to the macro-perspective of the techno-economic paradigm. Indeed, the notion of the techno-economic paradigm exhibits essential similarities with Schumpeter's approach to Kondratieff cycles as historical individuals, related to specific institutional and organisational characteristics. Like the technological paradigm shapes technological trajectories which are related to the entrepreneurial opportunity space, so the techno-economic paradigm outlines institutional, organisational and technological conditions for entrepreneurship on an economy-wide scale. Techno-economic paradigms then constitute a framework for the articulation of entrepreneurship, as they channel and shape the entrepreneurial stimulation of innovation and related coordination efforts. Accordingly, the distinction between Schumpeterian and Kirznerian entrepreneurship has been related to a differentiation between the creation of a new techno-economic paradigm and the movement along trajectories of technology and development (Nooteboom 1999: 127n). Elaborating on that argument allows for an exploration of the impact of entrepreneurship on the techno-economic paradigm, and vice versa. As depicted in Figure 9.2, Schumpeterian and Kirznerian types of entrepreneurship, with a particular focus on innovation and coordination, may be distinguished regarding their impact on techno-economic paradigms.

Schumpeterian entrepreneurship, on the one hand, deals mainly with the introduction of novel production possibilities that constitute a techno-economic paradigm. These possibilities may be characterised as radical, generic innovations, including new types of inputs, outputs, and of course the production process itself. They contribute to the emergence of a new techno-economic paradigm which drives comprehensive structural and institutional changes. Capabilities of leadership and creativity belong to the carrying out of that function. Kirznerian entrepreneurship, on the other hand, deals typically with the exploration and discovery of already existing yet overlooked production possibilities, and other business opportunities, within the range of an established techno-economic paradigm. Kirznerian entrepreneurs contribute to the diffusion and stabilisation as well as to the stepwise exhaustion of the economic potential of a techno-economic paradigm. This implies that the entrepreneurial coordination of the economic process, in terms of Kirznerian discovery, involves the modification of innovations. Coordination may contribute to the generation of types of innovation that affect the economic process without exhibiting essentially paradigmatic qualities. The capabilities of alertness and market knowledge are most indispensable with regard to that specific function.

Furthermore, the aspects of novelty and uncertainty shape the relationship between these types of entrepreneurship and their impact on stability and change of a techno-economic paradigm. Uncertainty accompanies paradigm change in most domains of the economic process, caused by Schumpeterian entrepreneurship as the driving force of the creative destruction of technologies and organisations. Its exercise of paradigmatic leadership in terms of the institutional creation and dissemination of new routines and cognitive frameworks is interconnected with the technological dimension of the new combinations of the means of production. However, while the new techno-economic paradigm diffuses, the mismatch of technological structures and the institutional set-up imposes a restructuring process on the economy, including an adaptation of institutions to those patterns which are already established in the pioneering lead sectors. The full implementation of these paradigm-based cognitive devices and institutional frameworks may lead to a decrease of subjective uncertainty, promoting a situation in which the

structural crisis that has emerged from the mismatch of technology and institutions is temporarily resolved. This adaptation may be perceived as a discovery process of the Kirznerian type that is also relevant for a stabilisation of the paradigm.

Figure 9.2: Entrepreneurship and techno-economic paradigm

Types of Entrepreneurship	
Schumpeterian Entrepreneurship	Kirznerian Entrepreneurship
Entrepreneurial Function	
Innovation: By Creation and Leadership	Coordination: by Discovery and Alertness
Impact on Techno-Economic Paradigm	
Expansion of Production Possibilities by Creation of Novelty	Exploration of Production Possibilities by Discovery of Opportunities
Destabilisation of Established Techno-Economic Paradigm	Exhaustion of Established Techno-Economic Paradigm
Foundation of New Techno-Economic Paradigm	Stabilisation of New Techno-Economic Paradigm

Moreover, the institutional framework does not constitute an economic system which may be perceived as an organisation in the Hayekian sense, that is an ordered formation following the common purpose of a supreme planning authority. The latter case may be relevant for specific enterprises, in which entrepreneurial leadership includes cognitive aspects, yet in the case of a whole economy even the ordered pattern of institutional adaptation does not compensate for the persisting dispersion of knowledge and the resulting need for coordination efforts. In contrast to that, a constructivist type of planning in Hayekian terms would pretend commanding objective knowledge that is sufficient for a science-based anticipation of future developments in diverse socio-economic fields, including technological change (Hayek 1978a: 6). This is would potentially result in the misallocation of resources. Hence, coordination involves both efforts in institutional adaptation as well as search and discovery procedures of the market process. Indeed, the established techno-economic paradigm, with its propagation of new business opportunities, provides the terrain for the carrying out of Kirznerian entrepreneurship. It sustains discovery procedures as means for outlining the development potential of the paradigm, exposing it to the trial-and-error mechanism of the market process. Moreover, it has been argued that the paradigmatic means for coordination delimit information flows and thus allow for behavioural stability based on patterns of inter-subjective knowledge. Hence, the complexity of interaction in the decentral coordination of knowledge is reduced (Andersen 1994: 47). Therefore, the

performance of entrepreneurial search, discovery and coordination efforts depends on ordered devices for future-oriented calculation which are provided by an established techno-economic paradigm. Indeed, pattern prediction then may turn to pattern reproduction.[256]

The evolution of a techno-economic paradigm is paralleled by a transformation of the modes of knowledge articulation within the paradigm, involving ever more tacit dimensions in the course of diffusion, institutional adaptation and local absorption. The latter process of local discovery allows for a recurrence of structural variety according to local conditions, which stimulates interaction with the domains of knowledge creation. Consequently, the exhaustion of the economic potential of a techno-economic paradigm breeds the conditions for a paradigm change by contributing to the provision of diverse elements that need to be recombined in terms of Schumpeterian entrepreneurship. Thus, with regard to rapid economic change, the carriers of Schumpeterian entrepreneurship will play a major institutional role during the first phases of disruption, combining technological and cognitive dimensions of paradigmatic leadership, while the continuing gradual adaptation to local conditions points to stabilising as well as consolidating functions of Kirznerian entrepreneurship. This is in agreement with the character of knowledge-based economic change. Therefore, the more codifiable a specific segment of knowledge, such as formal technological knowledge or legal norms and codes, the more radical the type of socio-economic change it may promote, whereas non-codifiable knowledge which is embedded in routines rather accounts for a gradual type of change (Hodgson 1991a: 124).

This demonstration of institutional variety is of course also relevant for a reconsideration of the carriers of entrepreneurship. Indeed, quite in agreement with Schumpeter's historical expositions, the historically conditioned possibility exists that even states may temporarily serve as an organisational arena of entrepreneurial activities beyond the domain of the private sector. Related policies for Schumpeterian entrepreneurship would have to promote private sector initiative and private-public partnerships, accompanied by efforts in building linkages framed by adequate institutions, especially in the early phase of paradigm change. In the case of market failure, selective intervention would be only temporarily acceptable. Policies for Kirznerian entrepreneurship then refer to the shift from the prevalence of codified knowledge to the dominance of tacit knowledge during the local adaptation of technologies, focussing on economic coordination within an institutional order that is conducive to market competition. Furthermore, Kirznerian entrepreneurship matters also concerning knowledge coordination by means of public policies. The case of industrialisation in economic development may illustrate these aspects. Indeed, Schumpeterian entrepreneurship has been interpreted as a force in widening technology and development gaps between leaders and followers; whereas, Kirznerian entrepreneurship seems to contribute to a narrowing of these gaps, allowing for catch-up

[256] Still, the future course of the evolutionary process of economic change remains basically unpredictable in detail. Predictability would be at odds with the introduction of novelty in an economic system; an aspect which matters also in the context of an established paradigm. However, the concept of techno-economic paradigm is similar to the notion of general purpose technology, defined as a technology that initially has much scope for improvement and eventually comes to be widely used, to have many uses and complementarities; with examples like laser and internet technologies (Lipsey et al. 1998: 43n). The problem of limited predictability in coping with the evolution of this type of technology has been discussed by invoking possibilities for the conditional identification of potentials in cost-reduction and applicability, as in the case of electricity. Still, precise paths are not to be identified (Lipsey et al 1998: 48n).

growth in late industrialisation (Chea 1996: 200). Consequently, theoretical explorations of economic growth and development need to account for entrepreneurship as a decisive institutional component.

9.4 IN SEARCH FOR THE MICROFOUNDATIONS OF ECONOMIC GROWTH

Ever since its emergence as a distinct subject, Schumpeterian ideas marked the historically and empirically oriented branches of development economics, whereas the Keynesian perspective dominated formal theorising, with the aggregate perspective of growth theory as its most advanced exponent. According to the Keynesian position of Harrod and Domar, who invoked multiplicator and accelerator mechanisms in order to mirror the instability of economic growth in capitalist market economies, the quotient of savings ratio and capital-output ratio would basically determine investment and output growth.[257] In response to that, Solow provided a neoclassical growth model, built upon an aggregate production function with substitutable factors, representing a Cobb-Douglas type of production function with output as a function of capital and labour, constant returns to scale and diminishing returns to labour and capital respectively.[258] Saving rates, population growth and technological progress are determined exogenously, as there is no separate investment function. Equilibrium growth paths are approached in terms of steady state conditions, in which savings equal investment per effective worker, keeping the effective capital-output ratio constant. In the short run, an increase in the savings rate may raise output growth, yet capital accumulation leads to an adaptation of the capital-output ratio to a new steady state level. Beyond these level effects, in the long run, output growth is determined by labour force growth, that is the growth of the non-produced factor, usually simplified in terms of population growth. Technological progress then contributes to the augmentation of labour, modelled in its Harrod-neutral form by increasing output per worker on a given level of capital per worker; therefore allowing per capita output to grow faster than the labour force (Stern 1991: 123n). In the long run, increases in the rate of per capita growth depend on the exogenously determined rate of technological progress, reflecting the growth policy requirement of a deliberate manipulation of the latter (Solow 1994: 48). However, it is evident that technological change did not take centre stage in the underlying controversy on the stability of capitalist market economies between Keynesian and neoclassical contributions to aggregate modelling in growth theory.

Nonetheless, resounding Schumpeterian ideas, Abramovitz maintained that the major share of output growth may be related to advances in knowledge, that is, the discovery of knowledge and its exploitation (Abramovitz 1952: 141n). Subsequent empirical studies on the sources of economic growth, as provided by Solow, presented an aggregate production function with inputs labour L and capital K as arguments, perceived in physical units, as well as a variable t that should denote technical change in

[257] However, it has been suggested that these models were primarily concerned with a dynamic approach to the conditions of unemployment (Dorfman 1991: 585n). Indeed, in a contemporary survey of growth theory, Abramovitz referred to the models of Harrod and Domar not as growth theories, but as theories of steady state growth at full employment, lacking from an adequate treatment of capital formation (Abramovitz 1952: 170).

[258] Ruttan has emphasised that factor substitution was the major difference explicitly stated by Solow in countering the Keynesian models put forward by Harrod and Domar with their limitational production functions (Ruttan 1998: 3).

terms of shifts in that function, taking this common shape: $Q = F(K, L; t)$.[259] Solow then maintained that technological change, perceived as a residual factor in output growth after accounting for input growth, might explain up to 87,5 per cent of growth in real gross national product per man hour in the United States between 1909 and 1949 (Solow 1957: 312n).[260] Further efforts in empirical accounting for the sources of growth would define total factor productivity by the rate of output growth excluding output shares of the weighted contributions of labour and capital input growth, then also attempting to break down this residual into more refined factor contributions (Nelson 1998: 504n). The residual interpretation as a reflection of technological change, however, was paralleled by interpretations which pointed to the role of human capital, economies of scale, as well as efficiency gains in resource allocation (Abramovitz 1989: 14n). Still, in spite of advances in formal modelling, neoclassical growth theory has continuously struggled with an explanation of the sources of economic growth that would fit empirical conditions, hence stimulating efforts in a modification of the neoclassical approach, principally by an endogenisation of technological change. This assessment also holds regarding the comparison of international growth patterns (Ruttan 1998: 4n).

The debate on cross-country convergence has been stimulated by the empirical observation that that poor countries would not catch up with industrialised economies in the way predicted by the Solow model in terms of absolute convergence. Due to the lower per capita stock of capital in the initial stage of development, denoting a higher capital productivity, poor countries should exhibit faster per capita growth of gross domestic product than rich countries, yet exhibiting a decelerating advance over time. Accordingly, in the case of open economies, a higher rate of return to capital in poor countries should trigger capital flows into these areas. Predictions like these have not been corroborated empirically (Romer 1994: 4n). However, the Solowian framework allows for country-specific parameters, like savings rates, promoting a type of conditional convergence in terms of country-specific steady-state positions. This implies that an economy may grow faster the further it is initially below its specific steady-state position, whereas variations in savings rates, for instance, may impede convergence processes. In a modified modelling framework, conditional convergence is shaped by government policies and other country-specific growth variables, like educational attainment. Indeed, Barro's findings of a cross-country regression analysis, covering the growth performance of 100 countries from 1960 to 1990, allegedly support the case for conditional convergence, compatible with an augmented Solowian approach (Barro 1996: 12n).[261]

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[259] The implicated possibility of measuring capital as a statistically approximated aggregate was debated during the "Cambridge capital controversy", in which the concept of the aggregate production function in combination with the marginal productivity theory of distribution were criticised for logical inconsistency and empirical inapplicability, as formulated primarily by Joan Robinson in the framework of post-Keynesian theory.

[260] Comparing this approach with the Schumpeterian perspective implies a reconsideration of the fact that Schumpeter defined innovation by the setting up of a new production function (Schumpeter 1939: 87n). The related perception of the production function in terms of the planned or realised production of firms and industries differed essentially from Solow's position on aggregate growth, also due to the fact that Schumpeter considered capital not as a physical factor of production. The decisive contrast then rested in Schumpeter's focus on pioneering entrepreneurs and new production functions which are induced by industrial leadership, while neoclassical growth theory would cope with the aggregate production function in terms of an average performance of the economy (Ruttan 1959: 599n).

[261] In this context, the notion of β-convergence has been defined as the process of poor countries catching up with rich countries in terms of per capita income, due to faster economic growth, as distinct from σ-convergence, perceived as a declining dispersion of per capita incomes across nations or regions. Both

Specifying the role of technology in these empirical findings, the convergence of per capita incomes in developed economies has been reflected by a reduction of the related technology gap. This constellation has been paralleled by the extraordinary catch up growth performance of the East Asian industrialising economies, based on sustained inward technology flows (Mowery and Oxley 1995: 68n). However, the problem of explaining the diversity of growth patterns has persisted. For instance, the least developed economies also performed with the lowest growth rates during the 1960s and 1970s, compared with the performance of industrialising and industrialised economies (Lucas 1988: 4). Moreover, in addition to the performance of the East Asian economies, which suggested that even an acceleration of the per capita growth rates of gross domestic product belongs to the repertoire of observable growth patterns, the productivity slowdown in Western Europe and the United States during the 1970s as well as the decline of the socialist economic system have intensified concerns for elaborating on a sound theoretical explanation of the convergence and divergence of growth rates (Nelson 1998: 507).

In dealing with these phenomena, endogenous growth theory has been built upon the notion of non-diminishing returns to capital, perceived as the produced factor. This implies that its marginal productivity does not approach zero during the accumulation process. Contributions to the increase of the output-labour ratio paralleling increases of the capital-labour ratio will keep the capital-output ratio constant, hence allowing for continuous growth in per capita income beyond the Solowian steady state. This effect may be produced by an array of factors that increase labour productivity, involving learning by doing, knowledge externalities, technological spillover effects, and the impact of education and R&D (Amable 1994: 20n). Krugman has synthesised the concerns of endogenous growth theory by three hypotheses which are designed to oppose neoclassical growth theory of the Solow type. First, social returns to investment are higher than private returns, due to external economies. Second, capital is a much larger share of input than measured in conventional growth accounting terms. Third, new technologies arise basically from market-driven R&D, hence technological change is endogenous to the economic process. Differentiating between growth and development theories, Krugman then maintains that new growth theory deals with the persistence of growth, whereas traditional development theory has been coping with the question of how to stimulate it. Hence, growth theory continuously ignores the problems of structural change that were of paramount importance for development approaches (Krugman 1993a: 30n).[262] Concerning the corresponding policy aspects, then, it follows that an endogenisation of the sources of growth implies that policy can affect both the rates and the levels of economic growth.

In the context of these approaches, the matter of knowledge has been taken to the fore, basically approached by industrial R&D as well as by human capital in terms of education and learning by doing (Ruttan 1998: 4n).[263] With regard to the related matter

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concepts need to be viewed separately, although the former, which dominates growth theoretical debates, may contribute to the latter (Barro and Sala-i-Martin 1995: 383).

[262] A similar point of view has been expressed by the assessment of Young's approach to increasing returns as incompatible both with the Solowian framework and endogenous growth theory, whereas a close conceptual relationship is observed regarding debates on balanced versus unbalanced growth in development economics (Sandilands 2000: 313n, 318n).

[263] Schefold suggests that problems in accounting for physical capital, as argued during the "capital controversy" between representatives of Keynesian and neoclassical growth theory, has only fuelled attempts of making the neoclassical capital concept even more comprehensive by including the notion of human capital. This procedure should widen the sphere of non-measurable factors which are then subjected to an accounting of their economic impact in production functions (Schefold 1997: 14). Yet it

of technological innovation, models in endogenous growth theory then tend to represent innovation processes as subject to the decisions of economic agents, as depicted by the notion of the representative agent, thus underlining the endogeneity of innovation in the economic process (Romer 1994: 3). This attempt of formulating microfoundations of aggregate phenomena may be interpreted as an essentially neoclassical venture that follows postulates of methodological individualism in terms of optimising decisions, as distinct from earlier attempts of Kaldor and Arrow in modelling the nexus of investment, learning and economic growth (Amable 1994: 21).[264] A complementary perspective is provided by the design of a specific R&D sector, in which human capital inputs determine innovation outputs, linked by a production function (Romer 1990a: 23n). These strands of theorising have been accompanied by explorations of the institutional sources of economic growth, pointing at aspects that are said to determine both the growth and development performance of an economy, such as well-established property rights frameworks and the stability characteristics of political regimes (Klump 1996: 110n).

Accordingly, endogenous growth theory has been perceived as a major contribution to the renaissance of Schumpeterian ideas in theorising on economic growth and development, regarding the matter of technological innovation as well as monopolistic competition (Romer 1990a: 19). It has been argued, in particular, that Schumpeterian ideas are principally perceived in the form of externalities and imperfect competition as related with the innovation process and the waves of creative destruction that shape industrial evolution (Fine 2000: 257). However, it may be suggested that the endogenous perpetuation of economic growth by processes of technological change which evolve from within the economic system then resembles a key feature of the Schumpeterian vision of economic development, as opposed to the Keynesian vision of economic stagnation in long-run growth which has also been a constitutive element of neoclassical growth theory in the Solowian tradition. Accounting for the Schumpeterian influence on endogenous growth theory, which may be interpreted as an attempt of modifying neoclassical theory while sticking to the general equilibrium framework, related efforts in modelling endogenous technological change, as refined by Romer, may provide an adequate domain for exploring the representation of innovation as a source of growth.[265]

The basic idea underlying Romer's approach to endogenous technological change is summarised as follows: "Economic growth arises from the discovery of new recipes and the transformation of things from low to high value configurations" (Romer 1996: 204). While evolutionary approaches tend to cope with the notion of knowledge, Romer puts forward the related concept of ideas, first of all rejecting the assumption of their character as public goods. Ideas are no public goods, because of their partial non-excludability, based on market incentives and regulations for private appropriability and control, nor are they human capital, because of their non-rivalry, nor are they to be

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has been also argued, that it was principally the challenge of analysing technological change, which led to the emergence of the "new growth theory", aiming at an endogenous modelling of R&D, learning and innovation (Dowrick 1995: 1n).

[264] In detail, the neoclassical foundations of endogenous growth theory have been outlined by pinpointing modelling assumptions on optimising behaviour, rational expectations, market equilibrium, and the concept of time preferences in coping with saving and investment (Dunn 2000: 282).

[265] Romer, however, has put forward a different assessment of economic thought. Price-taking assumptions in neoclassical models are confronted with the matter of increasing returns and externalities, which are also relevant for evolutionary economics. On a formal level, the latter are said to be highlighted by those contributions in endogenous growth theory that focus on monopolistic competition (Romer 1993a: 549n).

perceived as externalities, because of the zero opportunity costs they carry (Romer 1993b: 64). Moreover, ideas are non-rival. This implies a reconsideration of market size in determining the value of ideas, which implies a decisive departure from price-taking assumptions (Romer 1993b: 74n). The partial excludability of goods sets up incentives that promote their private production, whereas non-rivalry implies nonconvexities, that is, increasing returns; an effect which is formally mirrored by an output elasticity greater than one with respect to inputs (Romer 1990b: 98). In his model on endogenous technological change, which combines knowledge and technology with market structures of monopolistic competition, Romer then reconsiders three premises on technological change that reject the neoclassical approach to modelling firms as price-takers in competitive equilibrium. These premises are actually meant as a contribution to the Schumpeterian outlook of the model. First, technological change, defined as an improvement in the instructions for mixing together raw materials, lies at the heart of economic growth. Second, endogenous technological change arises from intentional actions as a response to market incentives. Third, the non-rival character of technology as an input to the production process allows for specifying costs of technological change which are related to the economic specificity of knowledge, perceived as equivalent of incurring a fix cost (Romer 1990a: S72n).
The model comprises of three sectors, namely a particular sector for research and the production of intermediate and final goods. Inputs are physical capital, labour L, human capital H, and technological knowledge, which has the specific property of an infinite growth potential. The research sector uses human capital H_A and the stock of knowledge to produce new designs for intermediate capital goods. The intermediate goods sector uses these designs together with a share of human capital and labour for the production of intermediate goods which represent sets of physical capital. The final goods sector then uses the latter together with shares of human capital H_Y and labour L for the production of the final good. The latter process is depicted by an extended Cobb-Douglas type production function with $x(i)$ indicating the quantity of input i in the production of the final good, that is basically the sets of intermediate goods, while the integral should indicate that indivisibilities and uncertainty play a role for the production of the consumption good only in the short run (Romer 1990a: S83):

$$(9.1) \quad Y(H_Y, L, x) = H_Y^{\alpha} L^{\beta} \int_0^{\infty} x(i)^{1-\alpha-\beta} \, di.$$

The production of intermediate goods, which are supplied to the capital stock that produces the final good, makes use of non-rival and partly excludable designs, that are generated in the research sector as codified technological knowledge, subject to spillover effects from a common knowledge base that represents the total stock of available knowledge. The output of designs is described as a continuous deterministic function of inputs applied. The aspects of non-rivalry, partial excludability and private provision of codified technological knowledge then allow for increasing returns and monopolistic competition in the production and supply of intermediate capital goods. Moreover, new designs also contribute to the aggregate stock of knowledge, thus increasing the productivity of human capital in the research sector in terms of a feedback effect. The aggregate stock of designs A then evolves as follows (Romer 1990a: S83):

$$(9.2) \quad \dot{A} = \delta H_A A$$

The more human capital resources H_A are devoted to the research sector, the more innovative intermediate goods will be produced under conditions of a specific productivity factor δ, and the higher will be the productivity of the final goods sector with corresponding effects on the growth rate of the economy.[266] This results in a steady state growth rate of the economy which depends on the allocation of human capital in research and production; in a simplified version denoted as follows (Romer 1990a: S92n):

(9.3) $g = \delta H_A$

Policy then may contribute to the allocation of human capital or to the productivity of research by granting subsidies, due to the rationale that economic agents on markets will not account for externalities, hence they will "under-invest" in R&D, as sensed from the position of a social planner (Romer 1990a: S94n). However, two effects stand out with regard to the general implications of the model. First, larger market size induces research activities and thus increases output growth. Second, this growth rate increases not in the whole population or labour force as a measure of market size, but in the stock of human capital (Romer 1990a: S73).
These arguments have been applied to policy considerations on economic development, again distinguishing between the views that economic growth is driven by physical capital in terms of machines or by intellectual capital in terms of ideas.[267] It is claimed that the productivity gap which characterises the economic performance of less-developed economies is rooted in an "object gap", to be closed by savings and accumulation, while an "idea gap" that reaches conceptually even beyond the manufacturing industries needs to be closed by interaction and communication with developed economies and the firms they host, especially multinational enterprises (Romer 1993a: 543n). Romer then presents the thesis that the filling of objects gaps meets high opportunity costs, associated with the accumulation of physical and human capital. This implies a reduction of present consumption in order to mobilise savings as a resource for investment, whereas, idea gaps are comparatively easy to overcome by the international flow of ideas, transferring embodied as well as disembodied knowledge at low cost. In addition to institutional incentives, including property rights and monetary policies, this involves an openness for foreign trade and investment, as carried by multinational enterprises (Romer 1993a: 546n). Moreover, migrant entrepreneurs may facilitate knowledge transfers, bringing ideas on management, production and distribution (Romer 1993b: 77n). Using ideas from external sources may be a first step in economic development for backward and poor countries, increasing opportunities for discovery and production. Producing ideas furthermore presupposes adequate stocks of human capital and access to ideas, leading towards an innovation oriented development path (Romer 1993b: 82n). Consequently, in policy terms, temporary subsidies for the attraction of ideas may be justified in the same manner, as

[266] Further variations of that approach have taken on the Schumpeterian idea of creative destruction. In this case, innovation is modelled as a process driven by the productive replacement of specific sets of intermediate goods by new sets of goods, emphasising the role of product quality in industrial competition (Amable 1994: 33n).
[267] An illustrative variation of that argument is provided by the metaphorical distinction of "hardware" as physical capital, "wetware" as human capital including tacit knowledge, and "software" as codified knowledge, which may be copied, communicated and reused at will, hence representing the non-rival and partly excludable factor of growth that is decisive in Romer's modelling efforts (Nelson and Romer 1996: 15).

subsidies for basic research may be justified by social gains that are higher than private gains in creating ideas (Romer 1993b: 87n).
However, modelling the empirically relevant matter of conditional convergence in the context of that framework has required a combination of the convergence-related aspects of the Solow model of neoclassical growth theory with the knowledge-based dynamism of endogenous growth theory. More specifically, the case of international technology diffusion, perceived in terms of a distinction of innovation and imitation efforts that accounts for Romer's notion of producing or using ideas as a source of growth, has been presented in a manner that allows for conditional convergence even in the case of non-diminishing returns to capital. It is argued that follower countries may grow faster than leaders and thus possibly catch up with their per capita income levels, depending on the size of the technology gap. This is due to the assumption that the imitation costs of introducing new technologies in the follower countries are lower than the corresponding innovation costs of technology leaders. Still, these imitation costs are assumed to rise during the growth process, for the pool of accessible ideas is reduced, reflecting diminishing returns to imitation which allow for convergence processes (Barro 1996: 8).
In conclusion, it has been pointed out that the degree of novelty to be associated with endogenous growth theories, positioned as specific exponents of neoclassical theory, remains rather low. Rather, endogenous growth theories derive their orientation from the mathematical modelling of concepts that have been prominent before with Schumpeterian as well as Austrian and evolutionary economic thought, then applied to the theorising on economic development and industrial innovation. Indeed, the influence of that type of appreciative theorising, perceived as a less formal yet historically and empirically more sensitive perspective, on recent advances in formal theories of endogenous growth has been explicitly stated (Romer 1994: 14).
Furthermore, both the evolutionary and the endogenous perspectives are in accordance with policy conclusions on the role of competition, property rights, and the public policy support of R&D (Nelson and Romer 1996: 16n). Nonetheless, the impression of converging positions seems to be at best premature, for the corresponding criticism of endogenous growth theories and their attempts to model microfoundations of economic growth also addresses fundamental aspects of the neoclassical approach, like individual rationality and market equilibrium.
This resembles the evolutionary criticism of neoclassical growth theory in the Solowian tradition, which has been labelled as unqualified for the analysis of growth and development, because it would abstract from uncertainty, local knowledge and institutional diversity as key features of capitalist dynamism (Nelson and Winter 1982: 28). Moreover, on methodological grounds, the modelling of equilibrium paths presupposes an assumption of reversible time in the modelling account, which may be confronted with the feature of irreversibility in historical time as an outcome of uncertainty and novelty (Clark and Juma 1987: 31n). These argument also hold regarding modifications of neoclassical growth theory that have been formulated in the endogenous growth approach. Nelson maintains that endogenous growth theory may take on Schumpeterian propositions of technological innovation involving market power in terms of monopolistic competition, yet the adherence to steady state equilibrium concepts remains incompatible with Schumpeterian ideas on economic evolution (Nelson 1998: 500).
In particular, the notion of the "endogeneity" of technological change refers to the situation that "certain outcomes (e.g., the availability of new technologies) need to be understood as the result of purposive actions undertaken by decision makers who are

responding to market forces in the pursuit of profit maximisation" (Rosenberg 2000: 106).[268] However, the concept of endogeneity poses methodological problems. Concerning the distinction of endogeneity and exogeneity, a realist argument on the endogeneity of innovation would propose that the underlying differentiation of causal relationships in the change of socio-economic systems becomes blurred, for these systems need to be understood as substantially open systems (Hodgson 1999: 144n). Similar arguments have been put forward by Schumpeter, who postulated that an endogenous theory of growth and development should include also those factors that evolve during the economic process, principally addressing the case of unexpected innovations (Schumpeter 1954: 1133). The exclusion of uncertainty and novelty is also relevant in the criticism of endogenous growth theories. For instance, it has been remarked on Romer's model of endogenous technological change that R&D operations are calculated in terms of accessible costs, hence abstracting from uncertainty (Nelson and Pack 1999b: 209).

Furthermore, according to the evolutionary position, the underlying assumption of a well-defined distinction of known and unknown technological opportunities belongs to the major deficits of neoclassical theory, expressed by the conceptual alternative of setting up or moving along production functions. Movements along a production function mirror altered choices, calculated within the data of a given choice set, as described by the process of factor substitution.[269] Technological change would imply the introduction of a production function that represents a new choice set of factor combinations. Innovation, however, essentially involves uncertainty regarding procedures and outcomes which are not to be described by the image of firms choosing from these types of pre-existing choice sets. Moreover, the distinction of moving along or setting up production functions does neither grasp gradual technological improvement nor related search and learning procedures as decisive features of technological innovation that are rather based on the difference between routine and innovation (Nelson and Winter 1982: 201n). These arguments also apply to the likewise controversial domain of empirical analysis. Abramovitz states that neoclassical growth accounting is misled in assuming that distinct sources of growth act independently from each other, as he points to interactions of technological change and capital accumulation, both in terms of tangible, physical and intangible, human capital (Abramovitz 1989: 23n).[270]

A related exposition of that argument, pinpointing the neoclassical concept of the production function, was prepared by Rosenberg's claim that the distinction between factor substitution and technological change would obscure essential features of

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[268] The notion of endogenous technological change has been criticised for an overemphasis on economic incentives and motives in the generation of technologies. In the case of non-profit motives in scientific evolution, technology may be exogenous to the economic system but endogenous to science; whereas, in the case of political motives as exemplified by the military sector, technology may be endogenous to the political-military system (Lipsey et al. 1998: 35n).

[269] The neoclassical concept of factor substitution in production functions has been criticised from an evolutionary position, for it is said to imply a reversibility of factor combinations that misrepresents the potential inter-relatedness of technological and organisational innovations, as well as the heterogeneity of production inputs and the specificity of skills that may be associated with a specific technological trajectory (Freeman 1987b: 43).

[270] Highlighting these concepts of capital, it has been claimed that the notion of capital as entertained by neoclassical economic theory deals basically with physical capital, and more recently also with human capital as a concept that shares crucial characteristics with the latter. Evolutionary concepts, however, put an emphasis on the accumulation of intangible capital as a multi-functional factor, embodied in skills and capabilities, including R&D. Both the intangible and physical elements of capital then may contribute to the comparative advantage of firms and industries (Justman and Teubal 1991: 1174n).

innovation processes, especially their cumulative and gradual character. According to neoclassical theory, given a production function with substitutable factors, changing factor prices lead to factor substitution in terms of the realisation of new factor combinations in a cost-minimising fashion. The search for this constellation, however, may be already interpreted as a contribution to technological change, involving search and implementation costs. Rosenberg identifies technological exploration as the source of factor substitution, thus the distinction between both processes becomes blurred. The production function may include all possible designs of factor combinations based on a given stock of knowledge. Still, their realisation requires further efforts in search, experimentation and learning (Rosenberg 1976: 64n). Furthermore, in the neoclassical production function framework, output growth may result from increasing the supply of inputs or shifting the production function, but also from altering the quality of inputs. In this process, economic agents become the decisive factor. This implies that skills and knowledge, as well as economic behaviour and motivation become crucial for analysis (Rosenberg 1976: 86n). Carrying on with that argument, and introducing entrepreneurial economic agents, it may be suggested that the movement along a production function resembles the coordinating efforts of Kirznerian entrepreneurial search and discovery procedures within a paradigmatic constellation, whereas the setting up of a new function would parallel Schumpeterian entrepreneurship with its creative, paradigm-building qualities that serve as the driving force of radical innovation.

In addition to the problem of uncertainty, further deficits of endogenous growth theories have been identified in specifying the institutional order underlying economic growth and development. It has been argued that the neglect of entrepreneurship and related market institutions in neoclassical growth theory would rather promote the image of an administrative command economy, governed by a social planner (Dunn 2000: 294n).[271] Similar propositions have been put forward in the context of the Austrian market process approach. Kirzner has claimed that neoclassical growth theories would fail to address the essence of growth, namely entrepreneurial discovery in the identification of investment possibilities, instead emphasising the usefulness of aggregate analysis and related planning mechanisms in supporting economic growth. Kirzner then concludes on the lack of institutional specificity in the neoclassical approach: "There was no suggestion that the set of opportunities likely to be in fact discovered might in some way depend on the institutional framework within which growth was sought" (Kirzner 1985: 70).

An illustration of these critical assessments is provided by the alleged misrepresentation of R&D. It has been suggested that R&D may augment factors of production, yet entrepreneurship would remain necessary for providing insights that could lead to new processes and products. Correspondingly, the focus on R&D as an engine of growth is

[271] Solow has criticised the microfoundations of endogenous growth models in terms of intertemporally optimising representative agents. This construction had been originally presented by Ramsey as an idealisation of policy-makers, not as an institutional representation of the capitalist economy (Solow 1994: 49). Indeed, the methodological orientation of endogenous growth theory is settled on a level that would have been considered as "pure theory" in Schumpeter's scheme, hence as essentially unfit to deal with the matter of economic evolution. It is noteworthy that Lucas, who contributed to the rational expectations approach and defended Friedman's methodological position, has claimed that the mechanism of economic development may be represented by modelling efforts in "the construction of a mechanical, artificial world, populated by the interacting robots that economics typically studies" (Lucas 1988: 5). Accordingly, the standard textbook on neoclassical growth theory presents an introductory gallery of pre-Solowian masters, with Schumpeter placed next to Knight, without even a single reference to the matter of entrepreneurship (Barro and Sala-i-Martin 1995: 9).

not a useful substitute for the corresponding role of entrepreneurship, as causes and effects of the market process may be confused. This argument applies also to the entrepreneurial sources of increasing returns and externalities (Holcombe 1998: 52n). Accounting for the heterogeneity of the capital stock as a reflection of the division of knowledge in the market process, involving entrepreneurial coordination, then allows for the thesis that neoclassical growth theories ignore structural features of economic growth that govern the process of technological change (Baetjer 2000: 166n). However, even on the level of individual firms, entrepreneurship remains a crucial feature of the economic process, which is not to be substituted for in terms of R&D. Entrepreneurship actually remains necessary for turning the R&D output into a competitive advantage of the firm (Witt 2000: 753). Hence, the models of neoclassical growth theory, also in the shape of diverse "endogenous" variants, continue to put those factors as arguments in aggregate production functions that are results of the process of economic growth and development, and not its sources (Röpke 2001: 37).[272]

The institutional dimension of innovation thus needs to be considered more explicitly. Accordingly, Metcalfe argues accordingly against the modelling concept of a separate research sector, for knowledge accumulation would be conditioned by the institutional and historical context, proceeding in the framework of market competition and evolutionary change (Metcalfe 2001: 11). Structural aspects may turn to historical forces when externalities are interpreted as historical singularities, reflecting conditions that shape the accumulation of knowledge which becomes a unique component of the accumulated capital stock of an economy (Herrmann-Pillath 1995: 36). Accordingly, it has been concluded that the notion of a knowledge-producing sector, modelled as R&D sector, remains empirically unconvincing, for the impact of R&D is difficult to identify, measure or even interpret (Stern 1991:127). This implies that human capital inputs into R&D operations do not necessarily yield a higher innovation output, an aspect which counters the nexus of expanding R&D activities and output growth. Likewise, informal procedures of knowledge accumulation and learning are neglected by the exclusive focus on R&D.[273]

Moreover, the assumption of linear progress in knowledge accumulation which leads to an indefinitely growing knowledge stock, and thus provides a decisive condition for unbounded growth in Romer's model of endogenous technological change, is contradicted by the essential uncertainty that is associated with R&D activities. Moreover, it ignores the paradigm-based evolution of scientific and technological knowledge, that is, the paradigmatic quality of knowledge (Dunn 2000: 292n). It is this quality which drives the unevenness and non-linearity of technological innovation, based on the interplay of minor and radical innovations that shapes the patterns of competition and structural change (Metcalfe 2001: 21). Consequently, the various attempts of endogenous growth theories in dealing with the microfoundations of economic growth by invoking the scheme of the optimising representative agent seem to misrepresent these aspects of uncertainty and paradigm-based economic change. All

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[272] Accordingly, empirical research has not yet established a significant direction of causality between gross expenditures on R&D and the growth rates of per capita income; hence, R&D may be as much a product of economic growth as it has been interpreted as its source (Barro and Sala-i-Martin 1995: 7). This assessment may rationalise Barro's claim that endogenous theories of technological change would not contribute to an analysis of cross-country growth profiles, a matter to be explored in terms of extended neoclassical approaches (Barro 1996: 8).

[273] An innovation input indicator like gross expenditures on R&D, for instance, which is usually settled at a level of about 2 per cent of domestic product in OECD economies, records only a faction of resources spent directly as well as indirectly for the various activities that are involved in the innovation process (Grossman and Helpman 1994: 31).

of this amounts to a misrepresentation of the role of entrepreneurship in economic development.[274]

However, further institutional and organisational aspects have been reconsidered in modifications of neoclassical theorising, associated with the microfoundations of economic growth. For instance, it has been suggested that the matter of management and organisation should be treated as an endogenous source of economic growth (Stern 1991: 128). Correspondingly, Stiglitz claims that endogenous growth theories lack from insights into the growth process due to failures in assessing learning by doing or scale effects on the microeconomic level. This hints at the role of economic organisation, that is the organisation of firms, the structure of markets, and the set up of the financial system that affects the whole economy (Stiglitz 1995: 80). Accompanying these comprehensive conceptual expositions, empirical analyses still have not been able to establish causal relationships beyond the correlation of institutional variables and aggregate growth indicators; hence, economic growth may also improve the quality of an institutional order (Aron 2000: 115).

Still, it has been argued that an effective exploration of the sources of economic growth needs to account for science, technology and business firms as intertwined domains, for the discovery and exploitation of knowledge is facilitated by firm- and industry-specific investment strategies (Abramovitz 1989: 28n). Indeed, principal among the topics that are prominent in the domain of applied innovation research but seemingly neglected in models of endogenous growth, is the institutional and organisational nexus between science, technology and economic growth, featuring in-house R&D and industry-university relations (Nelson and Rosenberg 1998: 47n). This amounts to the criticism that endogenous growth theories ignore the role of institutional and organisational patterns that constitute national or regional trajectories of economic development (Nelson 1997: 31n). According to Nelson, approaching the causal factors behind the immediate sources of growth, like R&D and human capital, then requires an understanding of institutions; proceeding in terms of appreciative research that favours conceptual proximity to the historical and empirical material over the generalising abstractions of formal theory (Nelson 1998: 513n).

A theoretical reorientation would of course also affect the relevant policy implications. Endogenous growth theory has promoted the possibility of sustaining per capita income growth by adequate policy measures, combining monetary and fiscal policies with a concern for industrial and innovation policies (Plosser 1992: 66n). Government is accordingly believed to exhibit a strong capacity for manipulating the growth and development process. Indeed, regarding an explanation of the causal mechanisms underlying the growth experience of the East and Southeast Asian economies, Lucas explicitly believes in the possibility of "making a miracle" in terms of policies that allow for international openness in the promotion of domestic learning effects, contributing to the accumulation of human capital as the principal engine of economic

[274] Nelson has suggested that Abramovitz foresaw most intellectual developments of growth theory already in his seminal review article, published in 1952, then contributing to an appreciation of technology and innovation as endogenous sources of economic growth (Nelson 1998: 501n). Abramovitz delegated a decisive role to entrepreneurship in augmenting the productivity of capital, representing qualities like "energy in search of economic improvement, tolerance for novelty and uncertainty, and courage in the face of risk" (Abramovitz 1952: 157). With regard to the institutional underpinnings of entrepreneurship, Abramovitz even claimed: "(T)he foundation of an adequate theory of capital formation does, in fact, involve grappling with a complex sociological tangle which can hardly be unravelled with the aid of such concepts and hypotheses as economics now furnishes" (Abramovitz 1952: 161n). Unfortunately, this Schumpeterian position was marginalised in the discourse on growth theory since the 1950s.

growth (Lucas 1993: 270n). This is in accordance with interpretations of the policy implications of endogenous growth theories that hint at the openness for foreign trade and direct investment as necessary conditions of economic growth in developing economies (Shaw 1992: 618n). However, an approach that involves institutional aspects in the microfoundations of growth and development would have to deal with these issues quite differently.

In an exploration of East Asian development, Nelson and Pack thus distinguish between "accumulationist" approaches with an emphasis on the mobilisation of savings for promoting investment-driven capital accumulation, stimulating economic growth along the production function of an economy. This position is compared with "assimilationist" approaches that account for entrepreneurship, innovation and learning as indispensable components in the assimilation of technologies, exhibiting various degrees of novelty (Nelson and Pack 1999b: 198n). Concerning the perception of technology, an accumulation-oriented position would focus on codified knowledge, as compared with the assimilation-oriented emphasis on tacit knowledge and learning by doing. This implies a rejection of neoclassical production functions and their definition of technological opportunities independently of entrepreneurial decision makers and their search strategies (Nelson and Pack 1999b: 200n). Evidently, the focus on accumulation represents neoclassical arguments on the sources of economic growth, also prevailing in its endogenous growth variants, whereas Schumpeterian, Austrian and evolutionary perspectives are well represented by the approach of technology assimilation. In spite of these differences in research orientation, at least a common concern with the relationship of institutions and innovation has been taken to the fore, in terms of institutional networks and industrial agglomerations (Klump 1996: 106n).[275] Combining these structural and organisational aspects of industrial evolution with a sound representation of its institutional dimension, including the matter of entrepreneurship, would add most convincingly to explorations in the microfoundations of economic growth, and hence also to regaining Schumpeterian perspectives on economic development.

[275] Even Lucas has expressed a concern with spatial agglomerations and the positive externalities they sustain, as he discusses the role of cities in the stimulation of economic growth by supporting externalities in the accumulation of human capital (Lucas 1988: 35n). Still, this spatial turn in recent neoclassical theorising copes with topics that have been extensively examined much earlier in certain strands of development economics, and even more so in contributions of the German Historical School, especially those delivered by Weber and Sombart.

10 INSTITUTIONAL DIMENSIONS OF INNOVATION

10.1 INSTITUTIONAL NETWORKS AND COLLECTIVE ENTREPRENEURSHIP

Firms do not operate in isolation. They interact with other firms and organisations on markets, in hierarchies, and in network relations. Hence, they may be part of user-producer interactions, supplier chains, or corporate network structures. Indeed, users may play a decisive role in articulating needs that drive the generation of innovation. Hence not the manufacturing firms themselves but user firms, as well as suppliers, may serve as sources of innovation (von Hippel 1988: 3n). External impulses for innovation are therefore of utmost importance; they have been classified as follows. First, innovation may be managed in-house by the firm, using the firm's own resources. This involves the interaction of different departments and thus links organisational components which are concerned with product development. Second, firms may obtain a competitive advantage by procuring innovation inputs from suppliers. These innovation inputs are embodied in purchased goods and services. Suppliers may interact directly with innovative firms, for instance by setting-up organisational frameworks like strategic alliances. Third, innovation may be stimulated by peers, that is similar firms, typically competitors. With regard to peers, a specific kind of collaborative relationship seems to be evolving as a means to gain information on new technologies. Formal arrangements then include licensing and establishing partner ventures. Fourth, meeting customer needs and tastes is decisive for the competitive strategy of innovative firms. Customers are particularly involved in the innovation process by sending their own training and support staff to the producers. This influences the direction of innovation, for instance regarding product design. Fifth, the public sector also stimulates innovation, among others involving public R&D facilities as well as institutions and organisations of education and training. Furthermore, government-procurement activities have continuously influenced the direction of innovation activities (Padmore and Gibson 1998: 53n).

In addition to that, Pavitt has presented an empirically grounded taxonomy of the sources of sectoral innovation patterns, highlighting the specificity of industries in coping with innovation. Firms in supplier-dominated industries like agriculture tend to devote few resources to R&D, preferring instead to rely on suppliers for the provision with process innovations. Their technological trajectories are accordingly based on the rationale of cost-cutting. Firms in science-based industries, like electronics and chemicals, in which science provides a major impulse for the direction of production and innovation, make substantial R&D efforts in order to commercialise scientific knowledge from universities and research institutes. Two types of firms may be distinguished in production-intensive industries. First, specialist suppliers with a focus on product innovation, pointing at the specific needs of customers. Second, scale-intensive firms in which innovation shall primarily help to resolve problems in the production sphere. These sectoral patterns of innovation activities are all related to specific modes of inter-firm cooperation and collaboration, hence underlining the need for a structural perspective on industrial change as a complement to the paradigm approach (Pavitt 1984: 354n).

Indeed, theories of economic development and industrial change have also accounted for these structural concepts, as indicated by Hirschman's concept of industrial linkages. Similarly, Perroux, in his approach to "growth poles", followed the thesis that economic growth would proceed as an industrially and geographically concentrated process in terms of specific poles of growth, spreading by different channels such as prices and flows of goods and services, as well as individual expectations; all of them representing the impact of external economies (Perroux 1955/1971: 279n). Accordingly, economic development would be based on the relationship between active groups of innovative industries and rather passive groups of imitating industries, following the lead of the pioneers (Perroux 1955/1971: 288). Thus it has been argued that Perroux promoted his concept of growth poles as focal points of industry-specific growth, mirroring a spatial expression of the Schumpeterian development theory, while approaching the matter of dominance, leadership and change also on an international scale. Locations of growth poles then define national or regional positions in the hierarchy of the international division of labour (McKee 1991: 86n).

The related concept of "development blocks" also focuses on the structural level of economic development, yet abstracts from the spatial dimensions of Perroux's approach and emphasises instead the role of entrepreneurship (de la Mothe and Paquet 1998: 5). The notion of "Schumpeterian dynamics" shall underline the focus on economic change, as realised from the viewpoint of the micro units of economic development, that is basically firms. Instead of coping with aggregate growth indicators, the analytical emphasis is oriented towards disequilibria and chain effects created by entrepreneurial activities in the context of market competition (Dahmén 1984: 25). Complementary technical and economic varieties may be visualised ex ante by entrepreneurs who build a "development block" by completing structural elements, involving the setting up of linkages. Accordingly, the creation of markets may be stimulated by technological innovation and the flow of financial resources in related industries (Dahmén 1984: 29n). This process may be implemented either as a concerted activity or as an uncoordinated attempt of utilising knowledge on new technologies and complementary investments (Dahmén 1988: 253). The impact of innovations in certain industries then creates structural tensions which are challenged by those entrepreneurs who carry out the function of ex post gap-filling, hence stabilising the development block. This specific function is performed by search procedures that allow both for unintended and unanticipated results (Dahmén 1984: 30).

Another variant of the concern with structural and institutional features of industrial innovation has been provided in the context of theorising on regional development, as formulated in the Marshallian concept of "industrial districts".[276] It hints at the role of the spatial agglomeration of vertically interacting, specialised firms, primarily small enterprises, which benefit from the circulation of new ideas as well as workforce skills, that is principally a local pool of specialised labour.[277] The dynamism of economic development then result principally from institutional factors like a specific industrial atmosphere and historically rooted cultural patterns in inter-firm and inter-personal relationships, contributing to the spatial intensity of external economies that is crucial in the identification of regional economies (Becattini 1989: 131n). This perspective

[276] Originally, it referred to the role of external economies that are internal to a certain industry, a viewpoint that was undermined by Sraffa's critique which rejected a delineation of individual industries in terms of externalities (Becattini 1989: 128n).

[277] Tacit and informal dimensions of innovation need to be reconsidered additionally, for they are especially relevant in small and medium enterprises that operate in established industries, with an industrial labour process oriented towards skilled labour and handicraft (Ebner and Perkmann 1999: 23n).

resembles a concern with regionalisation as a specific mode of development, reaching beyond the confines of industrial mass production. The corresponding thesis of a re-emergence of regional economies highlights the spatial expression of the technological, institutional and organisational restructuring of industrialised economies beyond large-scale production, representing a drive for territorial specialisation in skills and knowledge (Piore and Sabel 1984: 6n).
Industrial districts, in particular, are said to exhibit a high degree of cognitive proximity and culturally promoted trust as prerequisites for sharing tacit knowledge, while allowing for a variety of behavioural forms in sufficiently flexible institutional networks. Both the components of proximity and flexibility are sensed as necessary for dealing with radical innovation of the Schumpeterian type (Nooteboom 1999: 144). Indeed, paralleling the role of codified and tradeable knowledge in technological innovation, the impact of tacit knowledge remains crucial for the preservation of heterogeneity and variety in the competence profile of firms and industries (Maskell and Malmberg 1995: 9n). However, a major problem with the developmental dynamism of industrial districts seems to arise from institutional features like the formation of collective expectations that shape cooperative efforts in innovation. The resulting inertia of institutional networks could even result in a delay of the competitive restructuring of industries, hypothetically resulting in shock responses that involve economic collapse. Ideally, continuous learning thus should be accompanied by an equivalent process of "unlearning", namely a creative destruction of established routines. Institutional change and the restructuring of networks then provide the means for coping with new technologies (Maskell and Malmberg 1995: 25).
Thus, coupling industrial districts with the global production networks of multinational enterprises may contribute to the flexible adaptation of local networks as a device for sustaining regional development (Cooke and Morgan 1998: 75).[278] Nonetheless, arguments countering that position maintain that the analytical emphasis should rest on the interplay of globalisation and regionalisation, hence acknowledging the economic dominance of multinational enterprises which contribute to the disintegration of regional linkages in the context of their global production networks, rather than to the reinforcement of regional economies in the shape of small enterprise agglomerations (Amin 1993: 278n). However, the position remains valid, that regional factors contribute to the embeddedness of innovation and coordination, relevant for large and small enterprises alike (Cooke and Morgan 1998: 6). This position may be explained by hinting at the regional embeddedness of learning and networking capabilities which is due to externalities involving the transfer of tacit knowledge, the existence of localised knowledge pools as well as specific industrial cultures. Moreover, the impact of technological specialisation and regional policy capacities has been pointed out (Cooke and Morgan 1998: 6).
This role of spatial arrangements has been also investigated in terms of transaction cost concepts. Storper and Scott claim that the nature of transactions, that is the exchange of information, goods and services, constrains the spatial dimension of economic processes. The sensitivity to geographical distance increases with the complexity,

[278] This points again to spatial agglomerations with a high degree of institutionally embedded technological competence; a phenomenon that is related to the observation that technological globalisation, perceived as a facet of a comprehensive economic, social and political process, denotes primarily the international integration of geographically dispersed and locally specialised activities of multinational enterprises (Cantwell 1999: 238). This tendency implies a combination of organisational decentralisation and spatial centralisation of R&D operations as a component in the strategic orientation of multinational enterprises (Ebner 2002b: 57n).

frequency, tacitness and uncertainty associated with the transaction (Storper and Scott 1995: 506n). Especially the component of learning as a feature of transactions underlines relational qualities and hence the need for shared interpretative cognitive frameworks. Apart from the case of organisational integration, these frameworks may be embedded in regional constellations (Storper and Scott 1995: 508n). The latter reproduce historically rooted norms and conventions, exercising a major influence on the behaviour of economic agents. The institutional patterns which support transactions thus also support the capability for innovation (Storper and Scott 1995: 511n). Accordingly, knowledge, learning and innovation in a regional context are embedded within a regional pattern of institutions that interacts with the available physical and human resources and thus promotes distinct regional capabilities as the basis of sustainable advantages (Maskell and Malmberg 1995: 28).

Innovation capabilities then depend on the associational capacity of the firm which supports cooperative relationships among firms as well as between firms and the surrounding milieu, shaped by specific organisations and conventions (Cooke and Morgan 1998: 9). The corresponding networks of trust and reciprocity have been interpreted as an externality, that is an intangible commodity that is reproduced in the economic process, reflecting the influence of social capital as a development factor (Cooke and Morgan 1998: 7). Accordingly, Cooke and Morgan claim that trust and loyalty appear to be pre-capitalist attributes that are alien to the calculus of advanced capitalist economies, although they play a major role in economic life, basically as investment in social capital (Cooke and Morgan 1998: 32n). This argument underlines a resurgence of the Schumpeterian theme of institutional variety and asymmetrical institutional change, highlighted by the thesis of the developmental impact of pre-capitalist institutions in capitalist market economies. It is as well in agreement with Becattini's assessment of the notion of industrial districts, suggesting that interpretative schemes in a Schumpeterian manner may corroborate the claim that a rigorous calculation of profitability is marginal in most investment decisions which are implemented in these districts (Becattini 1989: 127n).

This is of course principally applicable to the matter of innovation. Yet, from a Schumpeterian point of view, at last the question needs to be raised which place is reserved for entrepreneurship in this discourse on regional development. The embeddedness argument seems to hint at an orientation beyond personal entrepreneurship, rather reflecting the late Schumpeter's position on the organisational dispersion of the entrepreneurial function, applied to collaborative ventures in a regional setting. The notion of embeddedness then points to the role of enabling and constraining institutional networks and organisational patterns, setting the context for entrepreneurial activity. However, it might also lead to the conceptual elimination of individual entrepreneurship in favour of a systemic approach. In accordance with the latter proposition, Lazonick suggests that the more complex, cumulative, and continuous an innovation is, the more collective the innovation process is likely to be, and the more collective is the unit of analysis to be accounted for. Complexity here denotes the necessity of coordinating knowledge in the division of labour, whereas learning allows for the cumulative appropriation of knowledge (Lazonick 1994: 247n). With reference to systems theory, the corresponding matter of collective innovation points to a specific cognitive space, in principle like a neural network, which interconnects different layers of the innovation process such as science, technology, production, finance and marketing. Striking a balance between commonality and diversity of knowledge then becomes a crucial function for organisational cultures, promoted by factors like trust

and proximity, for individuals and organisations store knowledge and learn by communication (de la Mothe and Paquet 1998: 3n).[279]
In its most consequential form, the underlying matter of collective entrepreneurship has been taken to the fore in the context of the systems of innovation approach, meant as a conceptual extension of the Schumpeterian theory of innovation. The latter is said to have shifted its analytical emphasis from personal entrepreneurship in newly founded enterprises to professional routines in established large firms. Hence, moving from an individual approach to a collective perspective on entrepreneurship should modify the Schumpeterian perspective while retaining its key concerns (Lundvall 1992: 8n). The notion of innovation systems integrates the Schumpeterian development functions of invention and innovation in a framework of institutional networks and systemic interactions. Indeed, constitutive formulations of that research perspective have insisted on the position that "organized entrepreneurs" are functioning in the context of systems of innovation, in which the introduction of new processes and products is considered as an ubiquitous phenomenon (Andersen and Lundvall 1988: 14). This variant of the systems of innovation approach then tends to deviate from the research agenda of allegedly agent-based approaches, like neoclassical and individualist evolutionary theory, by concentrating exclusively on the structural determinants of innovation (Andersen and Lundvall 1988: 15).
However, running parallel with that structuralist type of analysis, and continuing with the critique of Schumpeterian positions on the role of "heroic" conflicts between entrepreneurial agents and their habitual environment, the various modes of interaction among individual and collective agents have been taken to the fore, also pinpointing the interdependence of structures and agents (Edquist 1997: 17n). "Collective entrepreneurship" is accordingly stimulated by incentives for communication and cooperation among departments within firms, among firms in industrial networks, and between firms and government agencies (Edquist and Johnson 1997: 53n). In this context, it may be suggested that individual motivation and behaviour still have a role to play, for the notion of collective entrepreneurship primarily hints at the institutionally embedded efforts of individuals and groups in the various organisations that constitute an innovation system. It remains important to explore the institutional configurations that enable agents within an innovation system to carry out the entrepreneurial function. The system may stimulate, condition and regulate entrepreneurial activities, but it is the level of economic agents on which entrepreneurship is founded. Nonetheless, the system of innovation approach provides promising opportunities for regaining Schumpeterian perspectives by combining the matter of institutional networks with the subject of entrepreneurship.

10.2 APPROACHING SYSTEMS OF INNOVATION

The systems of innovation approach examines the role of institutions and organisations for the generation and diffusion of innovations within a territorial setting; reflecting the interaction of different agents (Nelson and Rosenberg 1993: 4n). Freeman's pioneering definition characterises a system of innovation in a broad sense as "the network of institutions in the private and public sector whose activities and interactions initiate, import, modify and diffuse new technologies" (Freeman 1987a: 1). Lundvall adds more

[279] In particular, it is proposed: "The learning engine lies in the particular configuration or pattern of ideas, techniques and commodities and the specialised items of knowledge linking them. And the learning capability of this transversal network is its capacity to transform" (de la Mothe and Paquet 1998: 3).

specific assumptions, highlighting knowledge as the most fundamental resource in economic development, and learning as the most important underlying process, embedded in a specific institutional context. Systems of innovation then consist of the elements and relationships which interact in the evolution of economically useful knowledge (Lundvall 1992: 1n). A major common theme of that approach is thus provided by the institutionalisation of science and technology, fuelling technological innovation and institutional change.[280] However, the notion of systems of innovation shall not suggest the image of a consciously designed and smoothly working entity. It corresponds rather with a set of agents engaged in institutional networks and influencing innovative performance (Nelson and Rosenberg 1993: 4n). Beyond these quite uncontroversial propositions, diverse analytical foci have been uncovered, reflecting the fact that the systems of innovation approach is rooted in various theoretical traditions. Indeed, structuralist, evolutionary and neo-Schumpeterian research perspectives may be distinguished (Ebner 1999: 143n).

The structuralist strand is concerned with the role of industrial structures and inter-firm relations. It focuses on the notion of user-producer relationships which describes modes of cooperation between producers and users of certain new technologies, products and applications, in which demand-sided user needs and the supply-sided technological opportunities are communicated by means of inter-firm linkages. These relationships may form processes of interactive learning and thus contribute to continuous knowledge generation and diffusion, primarily relevant for the case of product innovations (Lundvall 1992b: .47n). Industrial structures and the institutional set-up of an economy then determine the shape and performance of an innovation system. Accordingly, systems of innovation are described as subsets of comprehensive systems of production, constituted by systemic linkages which proceed the flow of goods, knowledge, and information (Niosi and Bellon 1996: 138n). This standpoint may be related with the concept of "structural competitiveness" which expresses a concern with industrial linkages and the institutional environment of firms in promoting their competitiveness on national and international markets (Chesnais 1991: 150n).[281] The matter of entrepreneurship, however, still widespread in the related debates on economic development and industrial evolution, is largely attributed to the structural constellations and patterns of the innovation system (Andersen and Lundvall 1988: 19n).

At this particular point, the evolutionary perspective on systems of innovation attempts to reconstruct the mechanism of generation, transmission and selection of novelty, thus elaborating on common motives within the systems of innovation approach (Edquist 1997: 6n). This perspective draws from evolutionary theories of technological change, thus pointing to elements of the innovation process like the creation of novelty, the accumulation of knowledge, as well as the selective roles of markets and the socio-

[280] As Freeman and Soete note in Schumpeterian terms:"Technical innovation contributes to the everlasting uncertainty and evolutionary turmoil, which are so characteristic of capitalism. The growth of capitalist firms, industries and nations is not just a matter of the quantitative increase of inputs and outputs (...), but of the qualitative transformation of the structure of the economy through successive waves of technical change" (Freeman and Soete 1997: 31).

[281] In an extension of that approach, the concept of "systemic competitiveness" has been put forward as a device for the analysis of both developed and less-developed economies. This concept differentiates between four interdependent levels of a national system: the micro-level of the firm, the meso-level of structural and technology policies, the macro-level of macroeconomic policies and the meta-level of organisational and cultural patterns (Esser et al. 1996: 40n). Although this hints convincingly at the role of policy networks for industrial competitiveness, still the source of competitiveness, namely the entrepreneurial element, is not taken to the fore.

political domain, with special reference to the non-optimising character of selection. The context of knowledge-seeking stands out as a factor in shaping the course of innovation. It is portrayed as a mixture of public debates, informal norms and formal regulations which set incentives, affect search directions and provide ex post as well as ante selection criteria (McKelvey 1996: 60n). Accordingly, technological change is characterised as an evolutionary process based on the systemic introduction of novelty which increases diversity with the innovation system. While the level of the firm provides a focal point of evolutionary analysis, the role of institutions is acknowledged especially with respect to the matter of institutional and organisational variety. Indeed, it is claimed that variety represents an indispensable feature of open dynamic systems. Distinguishing the segments of output variety, process variety and institutional-organisational variety, it is maintained that an appropriate exploration of qualitative change in economic systems, such as the matter of technological change, needs to take into account diverse actors, activities and types of output which together constitute a particular system of innovation. The density and intensity of flows and interactions then define both the structure and boundaries of the innovation system, marked by locally generated innovations which increase systemic heterogeneity and variety, followed by modes of diffusion which promote homogenisation (Saviotti 1996: 12). In conclusion, the system of innovation is characterised as a collective agent, even exhibiting specific modes of behaviour (Saviotti 1996: 190).

Although all strands of the systems of innovation approach refer to Schumpeterian ideas, a specific neo-Schumpeterian research agenda puts these institutionally embedded knowledge creating and disseminating organisations in the context of techno-economic paradigms, that is, it relates the institutional and technological dynamism of capitalist development with a specific business cycle pattern. Generally, this concern implies that additionally to firms, which still constitute the principal terrain where innovation and technological learning are taking place, further elements such as R&D facilities, education and training programmes as well as patent systems are taken to the fore. Systems of innovation are then described as specific networks of these organisational and institutional elements. Their emergence is portrayed as a result of the historical evolution of capitalist economies, that is especially as a result of the institutionalisation of science and technology in the economic, social and even cultural spheres (Freeman 1995a: 5n). Accordingly, the Schumpeterian argument which claims that technological as well as organisational innovations are the source of economic development in capitalist market economies is reiterated in terms of the dynamism of innovation systems (Freeman 1987a: 1n). This comprehensiveness of the neo-Schumpeterian approach, combining elements of business cycle theory with a historical perspective on national innovation systems, is met by the concept of the techno-economic paradigm, for the empirical significance and conceptual validity of the Kondratieff cycle scheme have been disputed, yet without affecting the basic propositions of the related theory of innovation which may be assessed independently from the regularity of business cycles (Rosenberg and Frischtak 1986: 5n).

All strands of the systems of innovation approach mirror a recognition of the outstanding role of institutions in innovation processes, including both formal and informal institutions. Formal institutions and organisations are taken to the fore by pinpointing the role of education and training, patent systems, as well as property rights and modes of industrial governance (Nelson and Rosenberg 1993: 9n; Freeman 1987a: 4n). Additionally, informal institutions in terms of norms, beliefs and routines have been put forward as determinants of technological innovation, even with explicit reference to the Veblenian notion of institutions as habits of thought (Johnson 1992:

25). Moreover, the role of belief systems and ideologies in the acquisition of scientific knowledge and the corresponding modes of technological learning is underlined as a crucial facet of the performance of innovation systems. Institutions may enable innovation as they carry information, reduce uncertainty, provide incentives, and frame various modes of governance and cooperation. They shape the particular modes of interactive learning and thus the outcome of the innovation process. As well, they coin the organisational structure of firms which exhibit an innovation performance that is continuously formed by the impact of institutional factors (Edquist and Johnson 1997: 51). The accentuation of the tacit dimension of knowledge, as well as the perception of institutions as transmitters of knowledge and information, exhibit a markedly Austrian flavour, which is only met by an evolutionary point of view. Still, although Austrian market process theory is said to transcend neoclassical concepts of rational choice in allocation and innovation, it is still limited by its perception of learning as a matter of allocation lacking from novelty (Lundvall 1997. 3). Moreover, also contrasting with the Austrian focus on market coordination, it is claimed that the diverse forms, contents and carriers of learning are in need of likewise diverse institutional arrangements for coordination, including aspects of market regulation as well as policy strategies (Dalum et al. 1992: 299n).

Institutional configurations are also used as a means of delineating the specificity of a system of innovation in terms of its territorial range and structural reach, that is, in its shape as a national or regional system. Primarily due to the position that the most relevant level of economic order and market activity is constituted by the nation-state framework, hence, the concept of national innovation systems has been put forward as a principal domain of interaction in the innovation process. In accordance with the institutional delineation, Nelson and Rosenberg note:

> "(T)he policies and programs of national governments, the laws of a nation, and the existence of a common language and a shared culture define an inside and outside that can broadly affect how technical advance proceeds (...) national differences and boundaries tend to define national innovation systems, partly intentionally, partly not" (Nelson and Rosenberg 1993: 16).

Similarly, Lundvall claims:

> "(B)asic differences in historical experience, language, and culture will be reflected in national idiosyncrasies in the internal organization of firms, the types of inter-firm relationship, the role of the public sector, the structure of financial institutions, and the nature, organization and volume of research and development" (Lundvall 1992: 13).

Paralleling the arguments on the agglomeration advantages of regional economies, this assessment of national economies points again to the role of institutional belonging and cognitive coherence as dynamising economic factors.[282] Moreover, as systems of innovation denote networks of interaction, a complementing way of delineation is provided by marking the linkages among the system agents, namely financial flows, technological-scientific flows, informational flows, social flows as well as policy links (Niosi et al. 1993: 211n). More specific opportunities are provided by the exploration of regional, national and supranational input-output structures, that is by pinpointing the structural pattern of economic linkages as an indicator of the range of an innovation system (Lundvall 1996: 356n).

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[282] Actually, these arguments are in accordance with Porter's assessment of the institutional determinants of competitiveness: "Competitive advantage is created and sustained through a highly localised process. Differences in national economic structures, values, cultures, institutions and histories contribute profoundly to competitive success" (Porter 1990: 19).

Indeed, comparative studies of innovation systems have been primarily concerned with national systems, although framed by the debates on globalisation and regionalisation which emphasise an assessment of regional as well as supranational levels of innovation activity. It is noteworthy that the institutional dimension of economic globalisation has been interpreted primarily as an expansion of those patterns that have been typical components of economic life in the United States. Accordingly, a reconsideration of the advantages of national institutional and organisational patterns has been applied to the matter of innovation performance. In a comparative approach, Patel and Pavitt, for instance, present the types of myopic and dynamic innovation systems. Myopic systems denote the United States and the Great Britain. In these economies, investment in technology is said to be exclusively oriented towards existing demand, supposedly resulting in an under-investment of technology search. Dynamic systems denote the cases of Germany and Japan, where learning processes and other intangible assets are said to be reconsidered as arguments in investment decisions, supporting long-term investment in technology. Basic differences in the institutional set-up of these types include financial systems and management styles, emphasising long-term performance in Japan and Germany, as contrasted with financial short-termism and the separation of financial and technical competence in the United States and Great Britain. Moreover, specific training and education systems have sustained the comparative advantage of German and Japanese firms by promoting cumulative learning (Patel and Pavitt 1994: 91n).

In another variant of that debate, Tylecote has discussed the influence of national cultures and structures on managerial objectives and strategic decisions concerning technological change, comparing the types of Anglo-Saxon stock exchange based systems with the public-sector bank-based systems of Germany and Japan. Differences are analysed concerning capital structure, inter-firm relations, and attachment of the workforce to the firm. Investment behaviour is accordingly discussed by contrasting a "short-termism" and "long-termism" of investment patterns. The Anglo-Saxon type of capitalism is said to exhibit short-term pressures on management, a low density of inter-firm relationships, and a low intensity of intra-firm community orientation, as compared with the avoidance of short-term pressure, the high density of inter-firm relationships and intra-firm community orientation in the so-called "Nippo-Rhenish" type (Tylecote 1996: 43n). Explanations point at a variety of historical factors such as the role of the state and shifts in social structures, which are related to culturally shaped attitudes towards labour and technology. Hence, it is also the impact of pre-capitalist institutions which shapes the innovation performance of firms, viewed in the setting of national economies (Tylecote 1996: 45).[283]

Also transaction cost arguments of comparative institutional analysis have been applied to the matter of national innovation patterns and competitive advantage. Soskice, for instance, distinguishes among specific coordination and governance modes as conditions of business organisation. They constitute the type of "liberal market economies" like the United States and Great Britain as compared with "coordinated market economies" like Japan and Germany, which are again differentiated according to an industry-based coordination in Germany and a firm group-based coordination in

[283] These historical considerations may also focus on the styling of organisational types. Lazonick, for instance, makes use of a modified Chandlerian approach in order to model cross-national differences in business organisations and competitiveness by differentiating between a British proprietary capitalism, an US-American managerial capitalism and a Japanese collective capitalism. In this approach, national specificity is rooted in social structures, ideologies and institutional configurations (Lazonick 1992: 119n).

Japan. A crucial aspect in this mode of comparative exploration is the economic capacity for providing public goods and encouraging positive externalities (Soskice 1994: 271n). The densely structured institutional framework of the coordinated type generates advantages for firms which proceed with incremental innovation, whereas firms in liberal types benefit from less densely established incentives and constraints, hence they exhibit advantages in proceeding with radical innovation (Soskice 1994: 274n). The extent of factor specificity and information asymmetry coins cooperation behaviour within as well as among firms. The capability for collective action then springs from the institutional context, with financial institutions, industrial relations and the legal framework of market competition as its decisive components (Soskice 1994: 279n).[284]

However, due to the decomposition of national systems and related types or models, both in terms of internationalisation and regionalisation, it is necessary to examine the validity of these categories. The national character of innovation systems which has been observable in the past seems to give way to the evolution of regional, or supranational systems of innovation beyond the nation-state (Nelson and Rosenberg 1993: 17n). National systems thus may be styled as segmented layers of institutions and production modes which integrate regional and local ensembles, such as technopoles and industrial districts with all their particular forms of industrial, technological and institutional logic (Garrouste and Kirat 1995: 235n). This acknowledgement of integrating variety and coherence is in accordance with the suggestion that economic and political modes of interaction on the national level remain essential, accompanied by increasingly important local, regional or supranational levels of interaction (Freeman and Soete 1997: 315). Accordingly, Lundvall stresses the continuous relevance of the nation-state as an institutional form, endowed with sufficient regulative policy competencies. In addition to that, national language and encoded cultural symbols exercise influences on inter-firm communication which shape the capability for interactive learning (Lundvall 1992a: 15n).[285]

Indeed, it is not simply the nation-state's capacity for resource mobilisation, but the mediation between institutionalised national characteristics and innovation processes which matters for an assessment of national systems. Wade emphasises the persistent dominance of national arrangements in the areas of trade, foreign direct investment and R&D. Stressing the tacit, path dependent and cumulative nature of knowledge in an uncertain environment, he draws the conclusion that national systems of innovation will persist in variety, while cultural differences determine patterns of innovation:

> "National boundaries (...) are proxies for physical, cultural, linguistic and educational nearness and sameness, which continue to affect the transfer of tacit knowledge from person to person and from organization to organization. National boundaries demarcate the nationally specific systems of education, finance, corporate management and government that generate social conventions, norms, and laws and thereby pervasively influence investment in technology and entrepreneurship. There can be no assumption that the evolution

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[284] Similarly, Scherer explores the thesis that cultural differences concerning the organisation of firms are accountable for national specificity in the relationship between firm size and innovation performance. He concludes that this may be relevant for the internal organisation of firms, as large Japanese companies seem to exhibit a competitive advantage regarding the coordination of knowledge and information within the firm. Moreover, these differences may shape external relations in cooperative ventures with other organisations, for instance in the area of R&D (Scherer 1992: 1428n).

[285] A similar argument suggests that despite the pressures of an international technological imperative, to which countries must accommodate themselves, there remain major differences in accommodation, based on a cultural imperative (Jamison 1991: 308).

> of national systems is guided by a mechanism that selects more efficient arrangements" (Wade 1996: 85).[286]

In conclusion, due to the persisting variety of decisive segments of institutional regimes on a national level, economic convergence may even promote an institutional and organisational divergence of the corresponding innovation systems (Amable et al. 1997: 5n). Therefore, the national or regional "home base" remains an important determinant for the operations of multinational enterprises, embedding their economic activities even in the context of globalisation (Porter 1990: 19n). This position should not overshadow the fact that firms compete on global markets, not countries or governments, as emphasised in Krugman's criticism of industrial policies in promoting a policy objective of "national competitiveness" which may distort incentives for international trade and investment as welfare increasing activities (Krugman 1994a: 28n). However, a reconsideration of institutional dimensions would supposedly lead to a more sophisticated assessment. This holds especially with regard to the role of the nation-state and related ideological factors, like national prestige, in the rationale of industrial policies. These factors remain relevant for developed and less-developed economies alike (Dunn 1994: 303n).[287] The matter of catch-up growth and technology assimilation in economic development mirrors the actual impact of these institutional factors on the development performance of industrialising economies, providing an effective example for the interplay of technological and institutional change. In particular, they illustrate the role of entrepreneurship in the institutional networks of regional and national innovation systems. With regard to industrialising economies, then, the assimilation of technologies represents an outstanding domain of entrepreneurial activity.

10.3 CATCH UP GROWTH AND TECHNOLOGY ASSIMILATION

The neo-Schumpeterian approach to economic development claims that techno-economic paradigms, defined as ideal types of productive organisation, provide the technological, organisational and institutional opportunity sets which shape national and regional development trajectories. Techno-economic paradigms are said to drive the cyclical patterns of development that had been reflected by Schumpeter's notion of Kondratieff waves, perceived as epochal formations that are marked by country-specific conditions. The diffusion of techno-economic paradigms enforces an economy-wide restructuring. The corresponding mismatch between technological and institutional conditions may be solved in a comprehensive search process, resulting in a temporary stabilisation of the new paradigm. Systems of innovation then provide those institutional and organisational means which are essential for coping with paradigm changes and thus for defining an economy's position in the international division of labour. These factors are also behind the dynamism of catch-up growth, experienced by some countries in specific historical periods (Freeman 1995b: 23). Indeed, techno-economic paradigms are characterised by the technological leadership of certain countries. Historically, a British dominance persisted during the first and second

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[286] Correspondingly, the persisting dominance of national innovation systems has been point out, reflecting an institutional setting in which education and training, corporate governance, consumer's tastes and defence procurement practices remain under a relevant national influence (Pavitt and Patel 1999: 113n).

[287] This includes the matter of "techno-nationalism" as a common motive in national development strategies, reflecting the historical relevance of ideological factors in industrialisation (Elam 1997: 161n).

Kondratieff; the third Kondratieff was dominated by Germany and the United States, while the fourth Kondratieff is said to be characterised unambiguously by the leadership of the United States, with Japan as a most impressive case of catching up in the growth and development process (Freeman 1987a: 54n). Specific institutional regimes that shape these Kondratieff waves include the forms and contents of state intervention and related patterns of regulation, framed by characteristics of the international regime of trade and investment.

The configurations of a techno-economic paradigm correspond to the historically evolving systems of innovation. For instance, the foundation of science encouraging associations during the first Kondratieff prepared the spread of professional engineering education during the second Kondratieff, leading to the emergence of in-house R&D and the spread of national technological organisations during the third Kondratieff. The emergence of industrial R&D, the expansion of scientific and technological education, as well as the rise of multinational enterprises as carriers of technology then characterised the fourth Kondratieff (Freeman 1987a: 67n). Every new techno-economic paradigm opens up a "window of opportunities" for catch-up growth and development, depending on social, cultural and political factors as well as natural resource endowments (Perez 1988: 94).[288] Accordingly, technological leadership promoted by productivity advantages is attainable for those economies which deal most effectively with paradigmatic requirements, like the late industrialisers Germany and Japan in their particular historical context. Sustained efforts in scientific, technological and educational infrastructures have contributed markedly to these historically unique efforts in the process of late industrialisation.[289]

The relationship between institutions and technology in industrial evolution belongs to the basic concerns of the systems of innovation approach, yet its intellectual roots have been traced in the theory of political economy put forward by Friedrich List, who focused on the institutional conditions of economic development from the position of an economically backward country, reflecting the situation of German territories in the middle of the 19th century (Freeman 1988a: 81). In accordance with contemporary developmental optimism, List's "*Das nationale System der Politischen Oekonomie*", published in 1841, preceded like-minded approaches that should evolve in the German Historical School, while exercising a lasting impact on industrial and trade policies.[290] Indeed, List's approach markedly influenced Latin American *dependencia* theory and related arguments for import substitution. Yet also export-oriented development patterns of the East Asian economies have been interpreted with reference to List's ideas (Menzel and Senghaas 1986: 21n). This is consistent with his appraisal as a pioneer in the area of theorising on the role of the nation-state in the institutional setting of capitalist development (Chesnais 1991: 152).

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[288] It has been claimed that initial conditions of growth and development encompass physical dimension variables like resource endowments, institutional dimension variables like regulatory controls, human dimension variables like attitudes towards economic efforts, and the dimension of economic structure with components like the degrees of vertical integration (Hurwicz 1995: 124). These conditions shall explain differing capabilities for catch-up growth. However, the emphasis on initial conditions neglects the co-evolutionary character of technological and institutional change.

[289] Germany, for instance, pioneered various organisational forms such as the modern research-oriented university and the professional in-house R&D laboratory of science-based industries in the 19th century (Keck 1993: 115n).

[290] Note that Lists's "National System" denotes not an empirical object but a systematic theoretical approach which should counter Quesnay's "Natural System of Political Economy" as well as Adam Smith's allegedly "cosmopolitan" ideas.

In particular, List emphasised the role of scientific and technological progress for economic development, basically exploring the conditions of industrialisation in the German territories that were confronted with the technological leadership of Great Britain. Among the "productive forces"' which are, according to List, crucial for the national capability of creating material wealth are the "intellectual capital" of science and education, well ordered industrial structures, as well as a political regime that should guarantee property rights and the rule of law (List 1841: 227n). Possibilities for a deliberate modification of these variables as a means for proceeding with industrialisation were said to depend on the institutional constitution of a nation (List 1841: 66). For instance, industry should be promoted by allowing for the accumulation of practical knowledge and productive experiences, that is through learning by doing, basically facilitated by temporary tariff protection for infant industries in a pre-competitive phase; an idea of mercantilist origin that was at first popularised in the United States by Hamilton, where List adopted it (List 1841: 72n). In terms of modern development economics, then, these positions have been interpreted as learning curve arguments, promoting learning effects that should spill over to other industries and sectors (Cooper 1991: 17). These positions on the institutional dimensions of industrialisation and economic development have been widely shared in research perspectives established by the German Historical School, accompanied by comparative approaches to the analysis of national development patterns. Therefore, according to Amsden, a specific tradition of economic thought on the institutional foundations of catch-up growth could be identified, ranging from List to Sombart (Amsden 1989: 13). Still, with regard to the relationship between technology and institutions, also the Veblenian orientation in institutionalism needs to be taken to the fore, for it recognised tensions that could arise from confronting traditional habits with modern industry. Indeed, Veblen's comparison of industrialisation in Britain and Germany has been appreciated as a useful example for exploring the interdependence of technology and institutions in economic change (Jamison 1991: 305n). Veblen claimed that industrialising economies would be confronted by two major obstacles to development. First, the availability of investment funds; second, the lack of knowledge and experience regarding modern industry as well as the persistence of customs and laws that could hinder the free use of technologies (Veblen 1915: 186n). Moreover, according to Veblen, a decisive difference in the mode of technology transfer that characterised the German situation in the 19th century and the English situation in the Tudor era resulted from changes in the character of those technologies that were to be assimilated. The earlier English case was built on the handicraft system which focused on personal skills. Migration thus represented an essential mode of technology transfer. Modern technology in the 19th century then accounted more decidedly for codified knowledge, with a reduced accent on the personal side of technology transfer (Veblen 1915: 187n).

Consequently, Veblen suggested that the assimilation of modern industrial technology would require less time and effort, as compared with the traditional handicraft system (Veblen 1915: 191n). This position should correspond with the possibility of institutional leapfrogging as a potential advantage of economic backwardness:

> "Germany combines the results of English experience in the development of modern technology with a state of the arts of life more nearly equivalent to what prevailed in England before the modern industrial régime came on; so that the German people have been enabled to take up the technological heritage of the English without having paid for it in the habits of thought, the use and wont,

> induced in the English community by the experience involved in achieving it" (Veblen 1915: 86).

Hence, with regard to the effects of economic maturity, as illustrated by the phenomena of conspicuous consumption and wasteful production, it was suggested that there existed an "advantage of borrowing the technological arts rather than developing them by home growth" (Veblen 1915: 86). The reason was given as follows: "In the transit from one community to another the technological elements so borrowed do not carry over the fringe of other cultural elements that have grown up about them in the course of their development" (Veblen 1915: 87). In the case of Germany, this advantage was exemplified by the "captains of industry", portrayed as the product of an industrially oriented socio-cultural selection environment: "They came under the selective test for fitness in the aggressive conduct of industrial enterprise, not under that of making good as prehensile conservatives in a distribution of pecuniary flotsam" (Veblen 1915: 193). Veblen even concluded with regard to the aspect of entrepreneurship, that "German adventurers in the field of business" would represent "captains of industry rather than of finance" (Veblen 1915: 194).[291]

The leapfrogging of certain development stages, as discussed by Veblen, has become a major theme in the analysis of late industrialisation and catch-up growth. Marxist debates, in particular, hinted both at the advantages and disadvantages of rapid technological change facing institutional inertia. Trotsky, as an outstanding contributor to these debates, claimed that economic backwardness provided at least the advantage of leapfrogging and selective assimilation:

> "A backward country assimilates the material and intellectual conquests of the advanced countries. But this does not mean that it follows them slavishly, reproduces all the stages of their past. (..) The privilege of historic backwardness — and such a privilege exists — permits, or rather compels, the adoption of whatever is ready in advance of any specified date, skipping a whole series of intermediate stages. Savages throw away their bows and arrows for rifles all at once, without travelling the road which lay between those two weapons in the past" (Trotzki 1930/1982: 14n, translation by author).

Accordingly, Trotsky's presented the thesis of uneven and combined development:

> "Unevenness, the most general law of the historic process, reveals itself most sharply and complexly in the destiny of the backward countries. Under the whip of external necessity their backward culture is compelled to make leaps. From the universal law of unevenness thus derives (...) the law of combined development — by which we mean a drawing together of the different stages of the journey, a combining of the separate steps, an amalgam of archaic with more contemporary forms" (Trotzki 1930/1982: 15, translation by author).

Trosky's account of the institutional dimensions of economic development thus provided arguments against the assumption of unilinear development paths, as addressed among others by seemingly orthodox Marxist positions as well as by those theories of economic development that dealt with the matter of development stages, inspired by historist concepts.

Rostow's theory of the stages of growth, for example, adopted a life cycle to structural change, maintaining that certain developmental stages of an economy could be identified by considering sectoral characteristics as well as consumption and investment patterns. The sequence of stages led from traditional society to the phase of take-off,

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[291] However, economic policies of the German states in the middle of the 19th century, when industrialisation was taking its course, were said to be oriented at the ideal of cameralism, focussing on the historically conditioned needs of an absolutist and militaristic state (Veblen 1915: 174).

further to maturity and then to the final stage of high mass consumption. The "take-off" represented a stage of sustained industrial expansion driven by investment and technological innovation; it was exemplified by Schumpeter's favoured historical example, namely the matter of railroadisation (Rostow 1971: 55n). However, Rostow's scheme of development stages suffered from deficits similar to its classical, historist and Marxist predecessors, principally the belief in linear progress and uniform development paths. Criticising these theories, Gerschenkron put forward the thesis of latecomer industrialisation as a specific historical pattern that would be relevant for backward economies, differing from the development of advanced economies in terms of the speed and structure of industrial transformation, and conditioned by specific institutional components (Gerschenkron 1962: 7). Following Veblen's theses on the advantages of backwardness, Gerschenkron maintained that latecomer economies could proceed with industrialisation more promisingly, the more new technologies would be available for a transfer from advanced economies. Hence, technology transfer would constitute a major factor in the industrialisation of backward economies (Gerschenkron 1962: 7n).

The catch-up hypothesis suggests that backwardness in terms of productivity levels implies a potential for rapid growth, expressed by an inverse relation between initial levels and growth rates of productivity, reflecting the degree of obsoleteness of technology embodied in the capital stock, as compared with the technology frontier. The productivity gap could be reduced in a process of large technological leaps, based on the assimilation of technologies that embody the technological frontier (Abramovitz 1986: 386n). The specific situation of backward economies, as illustrated by the development of Continental Europe in comparison with Great Britain, would be coined by dispersed capital, a lack of entrepreneurial talent as well as pressures for industrial concentration. The first factor should explain the outstanding role of banks in late industrialisation, as exemplified by the German case of banks controlling large-scale enterprises and industrial cartels; whereas, in situations of an even higher degree of backwardness, the state would directly propel the development process, as illustrated by the case of Tsarist Russia (Gerschenkron 1962: 14n). Consequently, it has been argued that Gerschenkron's lasting contribution to development economics rests on the argument that firms in latecomer economies would proceed with a specific pattern of technological upgrading, mirroring deficits of an incoherent institutional order (Gu 1999: 43n). The provision of appropriate institutional conditions for technology transfer then denotes a key problem of catch-up growth.

Procedures of transferring and assimilating technologies exhibit diverse forms and modes of realisation. Channels of technology transfer cover possibilities like material technology embodied in products as well as technological knowledge that is rooted in the skills of the workforce. In firms of late industrialising economies, these mechanisms deal primarily with the interaction of local firms and international carriers of new technologies, that is principally multinational enterprises.[292] The process of technological upgrading then follows a characteristic pattern that differs from industrial evolution in developed economies. It has been argued that latecomer firms enter the international product life cycle in the phase of standardisation, seemingly reversing its rationale, until they approach the phase of fully developed productive capabilities in its earlier segments, including R&D activities. These firms thus reverse the pattern of

[292] However, modes of technology transfer are industry-specific. Formulated in Pavitt's terminology, equipment purchase and licensing are common procedures in supplier-dominated and scale-intensive industries, paralleled by a focus on R&D and workforce hiring in science-intensive industries, while firms in specialised supplier-industries primarily cope with users (Bell and Pavitt 1993: 264n).

technological trajectories that is associated with developed economies (Kim 1999: 114n).
However, technological change involves sets of procedures and bodies of understanding which need to be considered in a new combination with organisational routines.[293] Various private and public investments thus need to be realised in the process of technology assimilation, including the establishment of externalities in areas like education, R&D and infrastructure (Nelson 1990: 45n).[294] Hence, technology assimilation represents a major domain of entrepreneurial efforts in innovation and coordination as an essential component of economic development, while technological learning involves entrepreneurship in terms of the innovation- and coordination-oriented capabilities of private and public agents.[295] In particular, the case of the East Asian economies demonstrates the validity of the argument that an assimilation of technologies already employed elsewhere also involves elements of innovation and learning as attributes of entrepreneurship (Nelson and Pack 1999a: 432). The acquisition of technology is related to the role of entrepreneurship, for economic agents which take part in the assimilation process need to explore new, unfamiliar and uncertain areas of economic activity (Odagiri and Goto 1996: 2).[296] Thus, national or regional innovation systems allow local entrepreneurs to develop capabilities for adopting and adapting ideas in technology assimilation, including an innovative recombination of the factors of production (Röpke 2001: 29n). Technology assimilation then implies a modification of existing production structures, allowing for the realisation of further improvements which may lead to the emergence of local capabilities for innovation.[297]

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[293] Therefore, the key problems of technology assimilation are attached to the absorptive capacity of the firm (Mowery and Oxley 1995: 70). This local character of technological change contrasts with the neoclassical approach to technology transfer as a smooth adaptation of input combinations to international factor price movements (Lall 1992: 165n).

[294] Efforts in dealing with the assimilation of technologies have been subject to changing historical conditions. Amsden suggests that industrialisation in Great Britain during the First Industrial Revolution was based on innovation in terms of unsystematic invention. Technological innovation during the Second Industrial Revolution became more systematic and easier to codify, thus promoting its international transfer. Late industrialisation in the 20th century, however, has been based on learning to improve technology already in use abroad; illustrated by the particular cases of the East Asian late industrialising economies (Amsden 1989: 3n). Due to the increasingly science-based character of technology, modes of technology transfer and acquisition have changed from imitative strategies to more sophisticated procedures of licensing and technical assistance (Amsden 1989: 20).

[295] The aspect of learning as an element of catch-up growth also points to a criticism of Gerschenkron's concept of technology transfer in late industrialisation, which seemed to neglect the necessary appropriateness of certain technologies, as the skill- or capital-intensive technologies which were imported by late industrialisers often faced a mismatch with existing economic structures and capabilities. This problem was also relevant for efforts in building indigenous science and technology bases, as pursued in the context of import substitution policies in Latin America during the 1960s (Pack 2000: 69n). The matter of technology assimilation belongs to the key factors in the failure of these policies and their replacement by export-oriented growth and development strategies.

[296] In the case of Japan, the Meiji Restoration of 1867 stimulated a strategy of catch-up growth, based on technology adoption with an emphasis on military demand, and accompanied by a comprehensive institutional and organisational restructuring, especially in the areas of the legal system and education (Odagiri and Goto 1996: 3n). The role of government remained strong, including the capacity for agenda setting, regulation and selective intervention, yet it did not obstruct the expansion of private sector entrepreneurship. Indeed, the social basis of these entrepreneurs was provided by samurai families whose members would attempt to capitalise on education, as illustrated by the example of the Honda family (Odagiri and Goto 1996: 9).

[297] The notion of production capacity then denotes a provision of resources for productive use within a framework of given input coefficients, whereas technological capability represents the provision of

Differing capabilities in proceeding with these efforts contribute to the persisting diversity of technology profiles among firms, industries, regions and nations, underlying the substantial divergence of growth and development patterns. Elaborating on that position, the notion of "national technological capability" has been presented, defined as a complex of skills, experience, and effort that enables enterprises to efficiently buy, use, adapt, improve, and create technologies; thus outlining systemic aspects of networks, linkages and institutional frameworks (Lall 2000: 14). These technological capabilities deal with the economy-wide interplay of three factors: first, capabilities for innovation, based on promoting physical capital investment, human capital and technological efforts in R&D and related infrastructures; second, incentives for innovation derived from macroeconomic aggregates, competitive processes, and factor prices; third, institutions like legal frameworks and industry-specific regulations which express the impact of incentives and constraints (Lall 1992: 171n). Technological capability is accordingly embodied in economic agents and the institutions that enable as well as constrain their activities, involving both private and public, as well as local and foreign agents who are engaged in the diverse modes of interaction that constitute a system of innovation (Dahlman and Nelson 1995: 89). Consequently, the performance of entrepreneurial agents in catch-up growth is markedly influenced by the embedding national or regional systems of innovation.

Related to the matter of national capabilities in technological assimilation is the notion of "social capability" in catch-up growth, which has been discussed most prominently in the context of debates on the international convergence of growth patterns. It has been described as the capability of economic agents in managing the productive and effective realisation of inward technology transfer, settled on the level of national economies (Fagerberg et al. 1994: 2n). Hence, catch up growth may be expected in those developing economies which exhibit sufficient degrees of social capability compensating for their technological backwardness (Abramovitz 1995: 36). Moreover, as an endogenous component of economic growth, social capability may become stronger or weaker during the process of catching up. Thus, historically, follower economies may even forge ahead of the former leaders, whereas leaders may fall behind the followers (Abramovitz 1986: 388n). Indeed, the realisation of a country-specific potential for catch up growth depends on the institutional setting of the international economic system, as well as on domestic subjects like political stability. It is structurally constrained by the availability of natural resources and the congruence of technology inflows with domestic economic structures. The underlying institutional aspects, however, are covered by social capability, on the one hand pointing to specific attitudes, world-views and related political institutions, on the other hand denoting institutional capabilities in using technology, primarily driven by training and education efforts that promote, among others, skills in managing large enterprises and large-scale technologies (Abramovitz 1995: 26n; 37n).

Moreover, in Stiglitz's account, prevailing norms and attitudes contribute to the formation of social capability by shaping factors like work ethics or attitudes towards innovation, perceived as a result of social interaction and corresponding feedback mechanisms that allow for sustained institutional effects (Stiglitz 1995: 69n). According to Abramovitz, then, the institutional elements of social capability are best understood by relating them to Kuznet's concept of "modern economic growth" as the development pattern of modern capitalist economies, based on the systematic application of science

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resources for the generation and assimilation of new technologies, including skills, knowledge and supporting institutions (Bell and Pavitt 1993: 260n).

to production.[298] This perspective resembles the Schumpeterian scenario of the institutional dimension of modern capitalism, although the matter of entrepreneurship remains largely neglected in terms of a conceptual reconsideration. Nonetheless, the matter of entrepreneurship may provide crucial insights for an exploration of social capability in stimulating and sustaining economic growth. Actually, it may be perceived as the institutional core of social capability. In this context, the embeddedness of entrepreneurship needs to be taken to the fore, contributing to an analysis of the relationship between institutions and innovation in economic development.

[298] Moreover, in exploring the institutional foundations of social capability, Abramovitz refers to Kuznet's historically-oriented thesis that secular, egalitarian and national ideologies became driving forces of modern economic growth, accompanied by the emergence of nation-states and conditioned by the requirement of stable government (Abramovitz 1995: 29n).

11 EMBEDDED ENTREPRENEURSHIP

11.1 STYLES, SYSTEMS AND TRAJECTORIES

Reconsidering the essential complexity, indeterminacy and irreversibility of innovation processes, as well as their institutional underpinnings in shaping economic behaviour, implies the acknowledgement that both evolutionary and historical perspectives are indispensable for an analysis of entrepreneurship, innovation and learning (Lazonick 1994: 245n). This appreciation of historical perspectives has inspired attempts to elaborate on a theoretical framework for "reasoned history" in Schumpeterian terms. Freeman, for instance, has underlined the necessity of grasping the historically rooted interdependence of economic development and institutional change in the spheres of science, technology, politics and culture (Freeman 1995b: 11n). These elements stand out as an indication of the co-evolution of technologies and institutions, perceived as a historical process. David, in particular, has suggested that institutional change follows an evolutionary and path-dependent scheme which is similar to the pattern of technological change, although this position is qualified by the argument that institutions are less adaptive to changes in the data environment. Path dependent institutional change does not follow efficiency considerations, as proposed in Menger's approach to the evolution of institutions. It is rather influenced by historical processes, including the persisting impact of singular events and temporary conditions (David 1994: 207n).

Viewed from this position, institutions may be approached as a component of a more comprehensive cultural system, defined by shared cognition, values and symbols (DiMaggio 1994: 27). Accordingly, it has been claimed that culture includes all the aspects of human behaviour and human society that are not biologically invariant across groups of humans (Mayhew 1994: 115). A historical perspective on cultural patterns should appropriately accompany the examination of innovation activities, invoking concerns which have been emphasised most intensely by Schumpeter (Rosenberg 1994: 60n). For instance, a historical perspective on the relationship between culture and innovation is applicable to the issue of needs, necessities and innovations. The generation of innovation does not necessarily respond to universal needs, but to a specific cultural context which defines whether certain artefacts are needful. This may lead to a differentiation between static and dynamic, respectively innovative cultures, based upon the appreciation and acceptance of novelty and change which becomes a decisive factor in the selective function of social and cultural milieus (Basalla 1988: 169n). Similar arguments have been put forward in the context of diffusion studies, discussing the role of culturally bound communication as a key aspect in the relationship between culture and technological innovation (Rogers 1983: 5n). In general, then, culture exercises an enabling, constitutive as well as a constraining, regulatory function concerning the formation of economic interests and choices (DiMaggio 1994: 28).

The interplay of institutions and technology is of paramount importance for the neo-Schumpeterian approach of the techno-economic paradigm. Indeed, it has been criticised for an inherent technological determinism, as it refers to the developmental necessity of an institutional adaptation to technological requirements (Williams and Edge 1996: 871n). Conflicts among interest groups and coalitions, however, shape the

techno-economic paradigm during all the phases of its existence. The corresponding logic of social efficiency in paradigm formation involves institutional components like communication, dominance and strategic interaction (Dockés 1995: 52n). Consequently, a more qualified representation of the techno-economic paradigm concept would argue that paradigm change puts the institutional setting under pressure, yet the mode of its adaptation is due to search and discovery strategies which include conflicts and compromises. If search strategies by individual and collective economic agents are perceived as undetermined processes, then failure is intrinsically possible. Any purposeful search for institutional adaptation will be limited by the non-intended consequences of spillover effects and externalities. This issue touches the matter of perception, choice and the institutional embeddedness of entrepreneurship and innovation. Accordingly it has been claimed that that the emergence of a new paradigm mirrors an "interplay between the community and the technical frontier" (Dosi et al. 1989: 32). Thus the institutional dimension of innovation exceeds the impact of rigidity, inertia and constrained adaptation, for it also enables individual and collective choices which may shape the diffusing paradigm and thus contribute to its lasting form. Institutional ensembles that are involved in this process are not necessarily those which have been designed as direct contributions to this interaction of knowledge generation and diffusion. Indirect contributions and influences may be equally significant (Soskice 1994: 276n).

This appreciation of institutional dimensions in the innovation process resembles the delineation of national and regional innovation systems. Correspondingly, Dosi has summed up several factors like externalities and market conditions which may specify economic processes in such a context. Additionally, he stresses the role of tacit knowledge for shaping technical coefficients and product technologies that are temporarily observable in different firms, industries and countries (Dosi 1988: 123). According to that argumentation, innovation processes are influenced by ideologies and belief-systems. Habits, norms, beliefs and other elements of the institutional framework influence the perception of microeconomic signals and thus also the resulting search and discovery activities (Dosi 1988: 127n). Built upon these arguments, the concept of "national trajectories of growth and development" has been put forward, denoting empirically observable differences in industrial structure, social organisation and government-economy relations from the perspective of a cross-country comparison. Distinctive factors of national trajectories also include the structural composition of production, industrial linkages and technological spillover effects (Dosi et al. 1989: 3n; Zysman et al. 1990: 185n).

From a similar angle, Zysman's "historical institutionalism", tends to relate trajectories of growth with "national systems of institutions". Historically grown institutional patterns fuel the emergence of specific routines that drive constellations of industrial organisation, industrial structures, as well as trade specialisation and policy orientation (Zysman 1994b: 249). Zysman concludes on the institutional embeddedness of innovation processes:

> "Technology, like market processes, is not disembodied. It develops in communities; it has local roots. The processes of learning that drive its development are shaped by the community and institutional structure, and consequently the technological trajectories can only be defined in reference to particular societies" (Zysman 1994b: 261).

Concerning the roots of these distinct institutional configurations, the role of the nation-state stands out in transforming social interests by implementing and enforcing basic

institutional structures for governing conflicting interests (Zysman 1994b: 275).[299] These relationships among economic agents, including the diverse carriers of the entrepreneurial function, are part of a network pattern that accompanies coordination arrangements of markets and organisational hierarchies all over the economic system. David maintains:

> "(R)eal economic actors function within many varieties of networks – social, and kinship-related, as well as commercially transactional and technological. Each of these potential webs of interaction and positive reinforcement into which individual agents may be drawn provides a theatre for the unfolding of historical dramas" (David 1993: 211).

In conceptual terms, this position resembles debates on the role of institutional embeddedness and network relationships among economic agents. These debates point to the constitutive topics in the discipline of economic sociology. They have contributed to an analysis of the various roles of institutions and their impact on economic behaviour, as already proposed by Schumpeter with reference to concepts of the German Historical School (Smelser and Swedberg 1994: 3n).[300] According to Granovetter, economic action even in its most rational forms is embedded in specific patterns of social relations that support interaction beyond markets and hierarchies: "The embeddedness argument stresses (...) the role of concrete personal relations and structures (or "networks") of such relations in generating trust and discouraging malfeasance" (Granovetter 1985: 488). In this context, Granovetter refers critically to Polanyian substantivism in economic anthropology as well as to the notion of a pre-capitalist "moral economy". Both resemble historist positions in arguing against the alleged universality of an economic logic of utility maximisation and market competition.

Indeed, Polanyi's notion of the social embeddedness of economic activities denotes a traditional type of economic life beyond market-centred coordination (Polanyi 1944/1990: 75n). Polanyi suggested that sustainable economic processes were embedded both in economic and non-economic institutions. Hence, the seemingly self-regulating market mechanism would be necessarily framed by non-economic institutions like religious beliefs, kinship-related custom, as well as government

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[299] In similar terms, it has been argued that the social construction of technology is influenced by institutional components, resulting in different styles of technology: "There is no best way to paint the Virgin, nor is there one best way to build a dynamo, (...) the concept of style applied to technology counters the notion that technology is simply applied science and economics" (Hughes 1989: 68n). Styles of technology are only applicable to historical time and geographical, respectively social space. Technological systems, that is interrelated modules of technologies, then express a certain style as they "differ from time to time, from region to region, and from nation to nation" (Hughes 1989: 69).

[300] The notion of economic sociology as a unified social science has been criticised for its all-embracing character, whereas a more focused analyses of institutional embeddedness and network patterns should yield more promising results (Steiner 1995: 175n). Still, methods for differentiating the scientific domains of economics and sociology vary. Methodological individualism, positivism and functionalism as constitutive features of neoclassical economics are usually contrasted with sociological notions such as the meaning of action, structural properties, and power-relations. Marginalism has been identified as the decisive factor in the intellectual separation of both disciplines, implying a reductionist notion of rationality which was repeatedly criticised by Weber and Durkheim. A related claim asserts that an interdisciplinary perspective needs to refer to institutionalism and post-Keynesianism (Ingham 1996: 243n). These arguments mirror a recent upsurge of theoretical and methodological concerns with economic sociology as an alternative to theories of rational choice, influential both in economics and sociology (Ebner 2001c: 439n).

activities.[301] The archetype of embeddedness in Polanyi's terms is thus a tribal society in which the processes of production and distribution are embedded in a logic of kinship-oriented social relations (Polanyi 1977: 55n). The corresponding confrontation of the coordination criteria of status versus contract, reflecting a distinction of community and society, is taken to the fore with reference to the sociological thought of Tönnies and Weber (Polanyi 1977: 48n). However, it is also a feature of Schmoller's and Sombart's ideas, to name strands of analysis that shaped the Historical School, in particular even pointing to Schumpeter's contributions. In accordance with the latter, Granovetter claims that non-market exchange relationships are often overestimated regarding their role in shaping pre-capitalist economic systems, still they would persist in the institutional variety of modern market economies (Granovetter 1985: 481n). This argument may be applied to the matter of entrepreneurship, focussing on its embeddedness in social relations and institutional configurations that mirror the characteristics of pre-capitalist economic formations, as presented in the Schumpeterian approach to entrepreneurship.

Accounting for the institutional dimensions of economic growth and development, thus, a variety of institutional forms underneath the surface of the productive fabric of national and regional economies needs to be considered. Unlike its representation in Marxian or Rostowian development theories of accumulation and modernisation, this variety of institutional forms does not constitute a hindrance for innovation and change, to be eradicated in the process of rationalisation, but rather contributes to the dynamism of economic development. Due to the asymmetry of technological and institutional change, the relationship between technology and institutions will exhibit different patterns in different situations and historical periods, characterised by different degrees of coherence (Johnson 1988: 279n). An exploration of that dimension of national or regional development trajectories then attracts an application of the notion of economic style, originally emerging from historist debates on the stages of economic development (Schefold 1988a: 157). In particular Spiethoff's approach to economic styles may be taken to the fore. As a historical and comparative approach to the institutional analysis of economic formations, this notion of economic styles should encompass essential characteristics of an economy, like predominant economic attitudes, socio-economic structures, technological aspects, and the endogenous dynamism of economic growth and development (Ebner 1999: 153n).

Accordingly it may be argued that capitalist market economies should be approached in terms of varying national and regional economic styles.[302] A national or regional economic style is set up by a specific combination of institutional, organisational and technological modules, perceived as historically rooted representations of the local development potential, yet also allowing for external influences.[303] A comparison of

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[301] In the field of comparative economics, a focus on allocation mechanisms is upheld. However, traditional-customary, market and command mechanisms have been differentiated, pointing to Polanyi's approach (Rosser and Rosser 1996: 7n).

[302] Current discussions of the economic style notion tend to focus on the distinction of certain national "models" of capitalist market economies by highlighting the impact of cultural values on economic growth (Klump 1996b: 9n). Unfortunately, this procedure reduces the notion of economic style to the dimension of economic culture; a perspective which may be compatible with single-factor approaches to economic styles like Müller-Armack's, but not with Spiethoff's conceptually more comprehensive approach. The latter variant is also closer to Schumpeter's perspective on that subject.

[303] Similarly, de la Mothe and Paquet have used basic elements of Åkerman's institutionalist theory of economic development as points of reference for the identification of evolutionary sub-games, perceived as institutional components of an economic system (de la Mothe and Paquet 1996: 23n). This argument may be understood in terms of North's definition of institutions as "rules of a game". It may be concluded

national economic styles would refer to the institutional coordination of investment, including the role of the state, the interaction between the sectors of industry and finance, as well as market structures and patterns of industrial competition (Meyer-Abich and Schefold 1981: 112).[304] In particular, the relationship between economic motivation and investment behaviour exceeds as an institutional determinant of economic growth and development, reflecting the substance of an economic style (Schefold 1994b: 8). It may be argued that these patterns promote specific manifestations of innovation and coordination, thus shaping the articulation of entrepreneurship.

Figure 11.1 distinguishes four constitutive dimensions for reconstructing national or regional economic styles. First, the economic dimension comprises of elements like the pattern of economic growth and development, including investment dynamics, industrial structures, sector-specific linkages and the structuration of the financial system. Second, the technological dimension points at the pattern of technological innovation and the related character of technologies employed in production. Third, the institutional dimension is concerned with the shape and impact of formal and informal institutions. The aspect of economic behaviour and entrepreneurship may be related to incentives for knowledge acquisition as well as to the acceptance of economic and technological change, marking the content of technological capability. Economic order then includes the allocation of property rights, whereas the matter of coherence represents the social substance of a particular mode of development, contributing to its sustainability. Fourth, the political dimension accentuates the economic role of the state and diverse modes of governance. In this context, the degree of political interference with the economic sphere as well as the regulation of conflicts may be explored as expressions of an economic style.

Economic styles are expressions of the historically conditioned specificity of development trajectories. Indeed, according to the neo-Schumpeterian approach, nations and regions cope with techno-economic paradigms on the basis of a broad array of institutional factors, including the social capability for technology assimilation. However, the continuity of certain institutional and structural elements may exceed the successive technological and institutional transformations that accompany the process of paradigm change. It is thus necessary to reconsider those recurring patterns which constitute the economic style of a nation or region, settled on different levels of historical continuity than techno-economic paradigms. Consequently, they are also different from Schumpeter's phases of economic development, which have been outlined with reference to Kondratieff cycles as historical individuals (Schefold 1988b: 175n).[305] For instance, the notion of Fordism as a recent phase of modern capitalism, dominated by industrial mass production, may grasp certain technological and

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that a coherent institutional order consists of various interrelated games, contributing to its creative as well as adaptive efficiency.

[304] A Kaldorian differentiation of inward- and outward oriented types of growth may illustrate the economic style perspective in the case of a cross-country comparison. Institutional and organisational patterns of an export-based mode of growth would include a financial system with strong linkages between domestic industry and finance. Moreover they would contain a specific mode of establishing consensual strategies on a policy level, as exemplified by the style of Germany's social market economy (Schefold 1981: 711n).

[305] The dynamism of Kondratieff cycles has been discussed extensively in the context of the French "*Annales*" School of Historians, in particular referring to Braudel's segmentation of historical time. Braudel's notion of the "long duration of time", for instance, should denote the era of commercial capitalism in Western Europe between 1400 and 1800, marked by an evolution of technological, institutional and social elements that exceeded the duration of individual Kondratieff cycles (van Roon 1984: 239n).

institutional patterns that have become dominant during a historical period. However, economic styles should account for the tension between continuity and change. Therefore, an ensemble of rather diverse elements would characterise an economic style that could be assessed in its historical individuality (Schefold 1994a: 219). Hence, an amalgamation of historically rooted institutions and structures marks the existing varieties of the economic styles of nations and regions. Due to this persistence of diverse forms and variants of modern capitalism, it has been proposed that a singular category of capitalism is inappropriate (Clegg et al. 1990: 34).

Figure 11.1 Dimensions and characteristics of economic style

Dimensions	**Characteristics of Economic Style**
• Economic Dimension	*Pattern of economic growth and development* *Investment dynamics and income distribution* *Industrial structures and productivity performance* *Intersectoral linkages and financial system*
• Technological Dimension	*Pattern of technological innovation* *Science base of technologies* *Scale of technologies and firm organisation*
• Institutional Dimension	*Economic behaviour and types of entrepreneurship* *Technological capability and industrial relations* *Economic order and property rights* *Social cohesion and modes of coordination*
• Political Dimension	*Modes of political regulation and governance* *State capacity, public sector and degrees of intervention* *Government activity and external relations*

Source: adapted from Ebner (1999: 163, Table 9.1).

These aspects of economic development, which are also constitutive for the Schumpeterian approach, have been recently interpreted in terms of systems theory. In this specific context, the impurity principle maintains that each functional system contains impurities which are not typical of the whole, but which are nevertheless necessary for the reproduction of that particular system. The related principle of dominance then suggests that every system exhibits a dominant functional structure. It follows that economic systems represent diversified pluralities which exhibit a dominant economic structure by which they may be classified, yet based on multi-facetted and inter-penetrating components (Hodgson 1988: 167n). Variety then represents a crucial element in evolutionary change: "(G)iven the potential variety of systemic combinations, and the reality of path dependency and cumulative causation, an immense variety of institutions and forms are possible" (Hodgson 1996: 419). Accordingly, capitalist market economies have been portrayed as systems of contractual commodity exchange which need the systemic coupling with non-contractual non-

commodities, such as trust, in order to secure their reproduction. Furthermore, the matter of social capital and trust in capitalist development points to the capability for spontaneous cooperation, also approached as "spontaneous sociability", denoting a distinct factor in the assessment of local development potential (Fukuyama 1995: 26n). In Stiglitz's words, this implies: "Capitalism develops best in a milieu which, in at least some respects, rejects the capitalist dogma of the (narrowly defined) self-interest" (Stiglitz 1995: 73).

Beyond the image of pure capitalism, for instance the historical persistence of the family as an institutional form indicates that modern capitalism co-exists with elements of non-capitalist economic systems that accord with a different logic of allocation and distribution (Meyer-Abich and Schefold 1981: 149n). The decomposition of these traditional institutional forms then may also induce a decline of the institutional foundations of capitalist market economies. In this context, North claims that the expansion of the public sector in developed economies, due to the increase of welfare expenditures, would not only mirror an intensified concern with infrastructure, health and education in an affirmative sense, but also tendencies of social disintegration.[306] Again, the impact of Schumpeterian ideas is evident, namely the argument of family sentiment as a motivating force in entrepreneurship; as well reflecting the Schmollerian approach to the ambiguity of institutional change in economic development. Indeed, it resembles the motive of a rise and decline of nations and civilisations that had been a prominent topic with the German Historical School, and was also part of Schumpeter's thought on socio-cultural evolution.

Yet recent approaches to this motive, interpreted in terms of the economic performance of nations, also take issue with the matter of institutional rigidities. Olson's analysis of the institutional determinants of stagflation in developed economies points to the erosion of growth dynamics due to the rent-seeking behaviour of special interest groups, organised as "distributional coalitions" in accordance with a logic of collective action that strives for obtaining larger shares of social output, thus imposing social costs on society at large (Olson 1982: 44n). Institutional rigidities like persisting barriers to market entry, arising from that process, then turn out as an impediment to the generation and adoption of new technologies, reducing the rates of economic growth and therefore contributing to economic decline (Olson 1982: 62n). This position of course mirrors another Schumpeterian concern, namely the bureaucratic stagnation of capitalist market economies. However, from a Schumpeterian perspective, institutional variety could provide a counteracting tendency even in this case, preserving entrepreneurial capabilities that excel in safeguarding the dynamism of the development process by overcoming rigidities.

The historically rooted institutional and structural variety that characterises the economic style of a nation or region also specifies the networks of the corresponding innovation systems. Indeed, systems of innovation may be viewed as components of a national or regional economic style (Ebner 1999: 158n). Industrial structures and institutional networks coin interactive relations in the innovation process, determining

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[306] North outlines the analytical problem of social cost and cohesion as follows: "Are these rising social costs a temporary phenomenon and irrelevant for economic efficiency? (...) And there are clear implications for the cost of transacting (which is really a surrogate measure for social capital). The clear implication is that the social glue that underlies informal institutional constraints is dissolving. And ultimately it is the strength of the complementary informal constraints that reduces the costs of contracting – that provides the trust, honesty, and integrity that makes possible complex low-cost exchange. When these informal constraints decline in effectiveness, we can expect an increase in formal rules and increasing costs of enforcement, which will be reflected in increasing litigation and the growth of government, resulting in rising costs of transacting per exchange" (North 1990: 24).

knowledge transfers and learning procedures. Economic styles then represent historically persisting conditions for inducing various modes of interactive learning, cooperation and governance. User-producer relations, in particular, may involve the exercise of market power. Thus processes of learning are not exclusively characterised by cooperation and trust, but also by conflicts and confrontation, especially during paradigm change. The actual relationship between these different modes of interaction may define a particular style of innovation, prevalent in an innovation system. In the case of national systems, however, segmented layers of institutions and structures are settled in regional and local ensembles. Differences in the set-up of these ensembles tend to persist, for a converging economic performance does not necessarily correspond with converging institutional and structural patterns (Boyer 1993: 50n). Indeed, it has been argued that national systems of innovation contain diverse local cultures that arise from externalities among firms and industries (Herrmann-Pillath 1995: 46; 60n). Accordingly, the firm, perceived as the decisive arena of innovation and learning, remains the crucial local factor in the multi-layered networks of innovation systems (Cimoli und Dosi 1995: 257).

Assumptions on cultural homogeneity as a condition of trust, consensus, and cognitive coherence are a prominent topic in explorations of the institutional underpinnings of national and regional innovation systems. These topics may indeed mirror essential features of economic life. Still, they underrate the role of conflicts and power relations as immanent aspect of innovation and structural change, thus misrepresenting the character of economic development considered from the Schumpeterian perspective.[307] A case in point is the confrontation of the homogeneity assumption with the matter of entrepreneurship. Proximity and trust may promote coordination efforts in the context of an already established paradigm, then basically coping with gradual change by incremental innovation. The continuous flow of knowledge within and between individuals, groups or organisations is also facilitated by a sufficiently high degree of cognitive proximity. However, differences in the subjective assessment of profit opportunities remain a primary condition of entrepreneurial activity in the private sector of a market economy. Therefore, expectations and search strategies that allow for entrepreneurial innovation and coordination are not compatible with a homogenous institutional environment.

The matter of cross-cultural entrepreneurship and migration might illustrate this argument, as in the case of entrepreneurship in Overseas Chinese networks that have been organised by Chinese migrant families in Southeast Asia. Pointing to these activities, it has been claimed that Southeast Asian development is driven by a distinct Chinese model of capitalism. This kind of economic style is said to differ from the Weberian definition of occidental capitalism by the lacking separation of households and firms, indicated by an economic spirit that promotes family enterprises and kinship-related business networks (Redding 1990: 10n). This family-oriented type of economic spirit would resemble aspects of a pre-capitalist economic rationale in Schumpeter's

[307] Actually these motives of trust and nearness bear close resemblance to the Japanese approach of consensual decision-making in organisations, involving the matter of long-term arrangements in industrial relations, presented with reference to a background of cultural homogeneity (Vogel 1987: 141n). Not surprisingly, the concept of national trajectories, which shares these motives, has been originally designed for the analysis of Japanese development (Dosi et al. 1989: 3n). Moreover, the systems of innovation approach has been extensively concerned with the Japanese case, then using the homogeneity assumption as an explicit simplification for analytical purposes (Lundvall 1992: 3). In view of that, it has been claimed that the Japanese example promotes the nation-state as the most effective framework within which organisational and institutional arrangements can thrive in support of economic growth (Chesnais 1996: 31).

terms. Still, these Chinese business networks that are based on personal relationships, denoted as "*guanxi*", also exhibit institutional forms and modes of interaction beyond family-oriented loyalty (Chan 2000: 9n). However, the crucial aspect of Overseas Chinese entrepreneurship seems to be associated with the matter of migration, leading to institutional constellations which allow for an entrepreneurial stepping-out from traditional local patterns of economic life that are less oriented towards endogenous change.

Although the activity profile of these business networks seems to highlight the entrepreneurial function of coordination, including search and discovery for yet unexploited profit opportunities, still, the aspect of migrant entrepreneurship also resembles crucial aspects of innovation in Schumpeter's terms, mirroring conflicts between entrepreneurial agents and their habitual environment. Indeed, the Schumpeterian approach to innovation emphasises the necessity of institutional variety and cognitive distance, allowing for conflicts which might arise during the innovation process. These conflicts, that result from the disruption of established routines due to discontinuous radical change, explain why Schumpeterian entrepreneurship needs to be associated with leadership confronting the impact of novelty and uncertainty. Accounting for the related problems of institutional dominance and power relations, the role of the state in facilitating these radical changes may be taken to the fore. This position would also allow for a reconsideration of government in the domain of technological innovation in East and Southeast Asian development processes. These processes are continuously formed by policy means, with government as a crucial agent. In general, the economic performance of nations and regions then depends on the actual shape of network constellations between private entrepreneurship, both of local and foreign agents, the public sector and government, in carrying out the functions of innovation and coordination. Consequently, it is a significant question which institutional configurations enable economic agents to fulfil these entrepreneurial functions, potentially embedded in the networks of an innovation system that reflects a distinct economic style.

11.2 THE INSTITUTIONAL EMBEDDEDNESS OF ENTREPRENEURSHIP

According to Schumpeter's theory of economic development, specific economic functions in the development process may be distinguished. First, the entrepreneurial function of introducing novelty and enforcing change. Second, the capitalist function of credit creation and risk-taking. Third, the inventive function of providing the economic system with a continuous flow of new knowledge (Schumpeter 1926: 117). According to Schumpeter, the differentiation of these functions results from the institutional dynamism of capitalist development. Historically, the specific function of invention resembles increasing technological specialisation, just like the capitalist function reflects the emergence of the monetary credit-system. The carriers of these functions have been organisationally separated in diverse modes and forms, depending on the actual historical context. For instance, with the rise of science-based technologies, invention has become an endogenous part of the economic process, reflecting the routinisation of innovation. Moreover, attempts have been made to internalise these development functions in the organisational structure of large firms. Still, beyond the single firm, these functions remain principally distributed among diverse economic agents, interacting on markets and other institutional arenas that are relevant for the

development process. These interactions may be concentrated in regions and nations, yet they may also spread on an international scale. Accordingly, entrepreneurial capability is conditioned by the configurations of the institutional networks that constitute a system of innovation, thus integrating the Schumpeterian development functions of invention, innovation and finance. Hence, it is not the system that acts entrepreneurial, but economic agents who experience the system as their institutional environment.

Embedded entrepreneurship then points to those individual and collective agents, who carry out the entrepreneurial function, interacting with the carriers of the development functions of invention and finance, as depicted in Figure 11.2. This should not imply a functionalist perspective, interpreting these functions as the underlying rationale in the existence of the agents who carry them out. Indeed, the relationship between development functions and their carriers is subject to historical variations, as are the focal points of activity within the parameters of these functions. Entrepreneurship, for instance, involves charismatic leadership in breaking routines, yet it contains also the cooperative bringing together of diverse parties involved in technological change.

Figure 11.2 Development functions in systems of innovation

Development Function	**Position in System of Innovation**
• Entrepreneurship	*Commercialisation of new technologies* *Formation of industries and linkages* *Creation and coordination of markets*
• Finance	*Financing of innovations* *Selection of entrepreneurial ventures* *Management of risk and uncertainty*
• Invention	*Creation of new scientific knowledge* *Dissemination of knowledge* *Provision of technological opportunities*

In this scheme, the entrepreneurial function integrates innovation-oriented concerns with technological and industrial evolution, as pointed out in terms of Schumpeterian entrepreneurship, with coordination-oriented aspects that belong to the key features of the market process. The entrepreneurial function refers to those agents who introduce new technologies to a national or regional system of innovation, then contributing to the coordination of its diffusion. Hence, entrepreneurs channel applications of new knowledge to markets and users. The capitalist function refers to the provision of financial means for the carrying out of innovations. Indeed, the aspect of financing innovations, including a selective role of the financial sector, constitutes a key aspect in the set up of innovation systems (Christensen 1992: 146). Moreover, it reflects the role of the financial system in coping with risk-management. Related arrangements that channel financial resources to innovative ventures influence expectations underlying the investment behaviour of entrepreneurs (Dahmén 1984: 32n). Indeed, Stiglitz has emphasised the role of economic organisation as a factor in growth and development, pinpointing the organisation of firms, the structure of markets, and particularly the

performance profile of capital markets. They promote institutional capabilities for monitoring and innovation, yet they are also subject to the impact of technological change (Stiglitz 1994: 67n).[308] Completing the scheme of Schumpeterian development functions, invention principally points at the role of R&D for processes of knowledge creation and dissemination. Paralleling scientific advance, invention provides technological opportunities that are prepared for productive application in terms of innovation.

The carriers of these development functions operate on specific markets, namely capital markets, markets for information and knowledge, as well as markets for goods, services and production factors. Interactions on these markets, accompanied by network coordination and hierarchical relationships, constitute the substance of embedded entrepreneurship. Major linkages then may be outlined as follows. The financial sector supplies resources to entrepreneurs, who base their innovative ventures on knowledge and information received from the inventive sector. Profits generated by entrepreneurial activity then allow for a compensation of financial and inventive resource suppliers. These linkages constitute a systemic pattern of diverse flows of resources, goods and services. The institutional framework of these interactions determines the level of transaction costs and thus the intensity of cooperation, the modes of coordination and learning, as well as the resulting innovation performance. Indeed, the institutional shape of a system of innovation may reduce transaction costs, due to a reduction of uncertainty and the provision of incentives for entrepreneurial activity, as the pattern of network relations coins the articulation of entrepreneurship. Accordingly, the embeddedness of entrepreneurship in these institutional configurations plays a crucial role for the mode in which economic agents cope with a changing techno-economic paradigm. An adaptation to imagined requirements of the paradigm may proceed within established routines, exhibiting an adaptive response. Creative response, however, may lead to a complete restructuring of routines and institutional patterns, as well as to major modifications in the technological and productive configuration of the diffusing paradigm (Ebner 2001a: 638n).

Thus, also in this case, the Schumpeterian verdict on entrepreneurship being shaped by institutions, while contributing to their restructuring, holds. Indeed, transaction costs arise from uncertainty and information asymmetry, that is from factors which are particularly relevant in the context of innovation and economic development.[309] In the present case, the level transaction costs determines the volume and intensity of

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[308] Recent contributions to endogenous growth theory have explored the domains of innovation, finance and development. Invoking Schumpeterian ideas, the relationship between financial systems and investment behaviour has been taken to the fore, based on the thesis that diversified financial systems stimulate innovation, thus contributing to productivity effects that drive economic growth (King and Levine 1993: 514n). In this context, the financial sector is responsible for the selection of innovation ventures. Moreover, it contributes to the diversification of risk, based on an assessment of expected returns (King and Levine 1993: 540).

[309] In this case, transaction costs are not merely understood as costs of market coordination which are compared with entrepreneurial profit as a coordination premium on imperfect markets, both eroding in an equilibrating market process (Wegehenkel 1981: 68n). Indeed, the concept of transaction costs needs to be modified more decidedly for the inclusion of uncertainty and knowledge, underlining its compatibility with evolutionary processes (Hodgson 1999: 199). For instance, a transaction cost argument of the Williamson type would maintain that using the market mechanism in technological innovation may be less favourable than establishing lasting relationships within firms. Still, it has been claimed that this argument needs to be augmented by reference to loyalty and trust, resembling a decisive advantage of firms in the innovation process as compared with market solutions (Hodgson 1988: 212n). The matter of the organisational form of networks is of course also relevant for an extension of the transaction cost approach.

interactions among the carriers of the development functions, also shaping the outcome of cooperative efforts. Consequently, transaction costs tend to impede the developmental dynamism that is associated with embedded entrepreneurship in systems of innovation. This impact may be viewed in the context of network relations that constitute the pattern of embedded entrepreneurship. Resource flows between the carriers of financial and entrepreneurial functions, for instance, are shaped by the financial structure of firms and industries, that is by the degree of outside capital involved in the innovation process. In terms of the transaction cost approach, credit-financed investment implies an assessment of the entrepreneurial venture under conditions of uncertainty and asymmetric information, fuelling problems of delegation and monitoring in principal-agent relationships. The selective role of the financial sector in examining the profitability of innovation projects thus may result in credit rationing (Christensen 1992: 147n).

The corresponding case is represented by the relationship between the functional domains of entrepreneurship and invention, based on the transformation of new scientific and technological knowledge to an application in the material sphere of the economic process. This entrepreneurial activity of putting to use certain inventions is based on differences in the subjective evaluation of new knowledge, distinguishing the entrepreneurial type from other economic agents who are involved in the development process (Audretsch 1994: 321). Again, uncertainty and information asymmetry contribute to the problem of identifying those inventions that seem to be the most promising objects of an innovative transformation. They influence the level of transaction costs that applies to the interaction of inventors and entrepreneurs, also shaping the subjective formation of expectations on the returns of investment in entrepreneurial ventures. Similar problems could arise from the specific character of technological knowledge with its public good segments, impeding a well-defined allocation of property rights that would allow for a related appropriation of returns (Nelson and Romer 1996: 16n).

However, also in these cases, the matter of leadership prevails. Hence, the role of entrepreneurship in the attraction of venture capital has been related both to visionary efforts and business competence (Carlsson and Jacobsson 1997: 286n). Entrepreneurial leadership proceeds with a combination of cognitive leadership and strategic coordination in the establishment of new routines and shared cognitive frames, reducing transaction costs while promoting capabilities for cooperative efforts in the innovation process. In particular, it has been proposed that commitments based on trust, and the charismatic authority that may be related to it, facilitate interaction based on constitutionally binding rules, despite the persistence of uncertainty. Charismatic authority, in terms of Weberian and Schumpeterian positions, may contribute to economising on dynamic transaction costs which arise during economic change, confronting socio-cognitive resistance. In this case, symbolic expression becomes an important means for establishing leadership by charismatic authority (Langlois 1998a: 210n). Even a strategy of radical change within large organisations thus needs to account for the mobilisation of leadership and cognitive authority, associated with Schumpeterian entrepreneurship (Langlois 1998b: 76n).

From a policy-oriented perspective on embedded entrepreneurship, an entrepreneurial state would contribute to the absorption of uncertainty, hence carrying out functions of Schumpeterian entrepreneurship, whereas it could also mobilise financial resources, then in the function of the Schumpeterian capitalist. The formation of capabilities in carrying out these functions results from co-evolutionary processes, involving government, firms and agents from the financial sector, based on a high degree of

administrative autonomy from special interest groups, yet sustaining knowledge and information flows (Röpke 2001: 22). Even from an economy-wide viewpoint, innovation may be perceived as a process that is promoted by "progressive coalitions" in the division of labour, established by individuals and organisations that contribute to the transformation of skills and capabilities (Bianchi and Miller 1996: 196n). Correspondingly, it has been argued that a "system of entrepreneurship" denotes the institutional arrangements of a "pro-growth alliance", allowing for entrepreneurial efforts in innovation and learning, while contributing to diverse modes of conflict regulation and coordination in the course of structural change (Chang and Kozul-Wright 1994: 864n).

Further institutional factors, like the reputation of economic agents, may contribute to the formation and stabilisation of these ensembles. Transaction costs in credit-relationships, for instance, may be reduced by mediation through reputable institutions of the financial system; illustrated by the matter of integrity and reputation in banking (Casson 1982: 211n). This applies also to the stabilisation of financial borrower-lender relationships by shared learning effects, encouraging the convergence of expectations and routine behaviour (Christensen 1992: 147n). In accordance with these explorations in the institutional conditions of embedded entrepreneurship, the role of user-producer interaction has been highlighted in terms of paradigmatic frameworks for the coordination of exchange procedures. A paradigmatic standardisation of institutional interfaces between the involved parties is said to support sustained cooperation and exchange; it allows for behavioural stability and thus promotes multi-layered interaction (Andersen 1994: 45). Complementing these paradigmatic aspects of interactive learning, entrepreneurial efforts in setting up new paradigms then presuppose the application of non-standardised interfaces for interaction, requiring institutional variety (Andersen 1994: 45n).[310]

These considerations may be boiled down to Casson's generalising statement that the profile of a national or regional culture influences the level of transaction costs and thus the economic performance of firms which operate in the nation or region under consideration. Also within organisations like business firm, specific types of cultural orientation may prevail. Cultures that promote trust and commitment reduce the need for controlling supervision, and by doing so strengthen the capability for spontaneous cooperation.[311] However, these aspects of firm-specific business cultures are most often derived from local conventions and traditions (Casson 1990: 87n). The entrepreneurial capability for establishing cognitive leadership is also embedded in these conventions. Accordingly, Casson claims that the advantage of cultural diversity lies in the proposition that entrepreneurial cultures need to support both competitive and cooperative modes of behaviour (Casson 1990: 93). This accords with the perception of innovation and coordination as the fundamental domains of entrepreneurial activity, to be promoted by the corresponding institutional and organisational patterns of entrepreneurial cultures.

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[310] The Schumpeterian spirit of that concept is well captured by the characterisation of entrepreneurial leadership in establishing such a paradigm for interactive relations, illustrated by the role of Fordism in the evolution of the automobile industry: "The spread of the Ford T to millions of buyers is an innovation which cannot be reduced to mass production and cheaper cars but also to efforts to persuade, teach and provide service to customers. After a period a process paradigm is emerging, defining precisely the interface vis-á-vis the suppliers" (Andersen 1994: 57).

[311] Corporate culture has been defined by Kreps as an ensemble of principles that specify modes for meeting unforeseen contingencies in the business process, combined with the communication of organisational trust and reputation (Kreps 1990: 92n).

Understanding these cultures as an expression of distinct economic styles demands a differentiation of the various levels of institutional embeddedness that characterise the dynamism of entrepreneurship and innovation in economic development. Markets, hierarchies and networks are the basic domains of interaction that need to be taken into account. From this point of view, the micro-level denotes routines and cognitive frameworks which constitute a specific institutional and organisational terrain for the activities of economic agents. On the meso-level, institutional networks and structural linkages are settled, supporting specific paradigms that evolve in industries and sectors, while accounting for the diversity of market structures. The macro-level refers to the relationship between continuity and change in the evolution of institutions, as mirrored by diverse economic styles. In conclusion, then, the entrepreneurial functions of innovation and coordination may be carried out in a variety of forms and modes, ranging from the commercial introduction of new technologies to the building of institutional networks. In any case, entrepreneurship is embedded in the institutional, organisational and technological matrix of the specific economic style of a nation or region. This style shapes the articulation of entrepreneurship, yet its evolution is also driven by entrepreneurial interventions. Consequently, it has been claimed that related policies need to be oriented towards their cultural context, accounting for local conventions that may affect their perception (Casson 1995: 189n). Innovation policies, however, primarily need to account for embedded entrepreneurship as the decisive internal factor of economic development.

11.3 IMPLICATIONS FOR INNOVATION POLICIES

A first approximation to the interpretation of economic policy in the Schumpeterian scheme of economic development would focus on the establishment of market competition. In particular, government would be responsible for providing public infrastructure, guaranteeing labour market flexibility, ensuring the functions of capital markets in financing the accumulation of physical and human capital, keeping open domestic and international product markets, and implementing public policies that are conducive to foreign investment and entrepreneurship (Giersch 1981: 58n). This is basically in accordance with a delineation of the developmental role of government, as presented by Stiglitz, pointing at the provision of education and training; the support of scientific and technological progress; the monitoring of the financial sector; the provision of institutional order and physical infrastructure; the regulation of environmental issues; and the management of the social welfare system (Stiglitz 1997: 13n). Government-economy relationships were also examined by Kuznets, who claimed that the modern nation-state would serve not only as "a clearing house for necessary institutional innovations", but also as an "agency for resolution of conflicts among group interests" and a "major entrepreneur for the socially required infrastructure", containing socio-economic disruptions that could arise from structural change in the process of economic development (Kuznets 1971: 346). Indeed, a focused approach to Schumpeterian perspectives in economic policy would highlight the role of entrepreneurship and innovation beyond neoclassical concerns for resource allocation (Nelson and Pack 1999b: 202).

Concerning the design of polices for the support of innovation and technology assimilation, Nelson has outlined three distinct roles of government: first, the support of basic and applied sciences, as well as scientific and technical education; second, government procurement, especially regarding military demands; third, the promotion

of technological competence in firms and industries (Nelson 1984: 657). Still, due to the experimental trial-and-error character of economic evolution, the role of government should not include comprehensive efforts in development planning. Private sector entrepreneurship may contribute more effectively to development efforts, paralleled by industrial policies that focus on the selective promotion of certain industries by provision of resources and temporary protection, as well as by means of public entrepreneurship and related government initiatives in carrying out strategic investment (Nelson 1990: 46n). The responsiveness of these policies to the productive needs of the private sector stands out as a major requirement for implementing efficient development strategies and corresponding incentive regimes, especially with regard to the public provision of financial, physical and human resources for R&D (Dahlman and Nelson 1995: 119n).

More specifically, beyond neoclassical market failure arguments, a policy approach that may be derived from evolutionary positions would have to focus on the transition stages of the economic process, hence adding emphasis on the agents of transition and change, namely entrepreneurs (Justman and Teubal 1991: 1176).[312] Policies for encouraging and rewarding entrepreneurship thus include the nurturing of learning procedures without impeding the spontaneity and independence of private sector initiative (Nelson and Pack 1999a: 434n). Consequently, infrastructural investments and institutional adaptations which support technological learning are portrayed as decisive components of long-term strategies for economic growth and development (Dosi et al. 1994: 11n). The type of infrastructure which has been recommended for pursuing these policy strategies still refers to an industry-specific approach, yet involving the strategic promotion of knowledge infrastructures in the areas of science and technology as a basic device (Justman and Teubal 1991: 1173n).

The Schumpeterian position provides a differentiated assessment of public policies in economic development, pinpointing the historical specificity of the role of the state, including the exercise of the entrepreneurial function by policy-related measures of government and its agencies. This applies also to the role of the state in the emerging "learning economy", in which a "didactic role" of the state has been envisaged (Dalum et al. 1992: 307). However, in order to cope with that matter in more concrete terms, government needs to be redefined as a moderator and even facilitator of institutional networking, that is as an institution builder, creating incentives and support mechanisms for entrepreneurship and innovation. This accords with a shift from market intervention to the inducement of certain economic processes. Indeed, the conceptual confrontation of markets and states as institutional domains with a specific logic of self-organisation and regulation has become obsolete due to the increasing complexity of economic processes, involving multi-layered externalities that require an institutional coordination (Herrmann-Pillath 1995: 21n).

These recent shifts in the institutional and organisational set-up of capitalist market economies, essentially reflecting a change of techno-economic paradigm, have affected the character of Schumpeterian entrepreneurship in a similar manner. Its principal facets of leadership capabilities are increasingly supplemented by the necessity to develop

[312] The welfare theoretical argument for public policies in the area of new technologies was most prominently outlined in Arrow's market failure approach, proposing that perfect competition would fail to achieve an optimal resource allocation in invention, due to uncertainty and the unpredictability of its output. In this context, invention would produce and use new information as a conventional commodity (Arrow 1962: 616). In market economies, private underinvestment in invention would be accompanied by an underutilisation of information in firms, due to prevailing uncertainty, appropriability problems and increasing returns in the use of invention. This reasoning in terms of externalities then pointed to government intervention, basically postulating subsidies for invention (Arrow 1962: 619).

skills which allow for the introduction of innovation by establishing co-operative relationships, (Ebner 2000b: 93n). This aspect underlines the argument that it is not primarily a lack of R&D activities, but rather a lack of well articulated entrepreneurial potential which causes major institutional problems in the process of economic development. Indeed, it may be assumed that entrepreneurship drives economic growth, then allowing for expanding R&D activities. Thus policies for the support of innovation should not be exclusively oriented towards technology-intensive industries, as labour-intensive traditional sectors may provide complementary opportunities. Especially in small and medium enterprises, the entrepreneurial generation and improvement of processes and products often results from tacit knowledge and informal procedures which are difficult to assess quantitatively, as they are most often found to include no R&D activities at all.

However, conclusions on the actual orientation of innovation polices tend to vary according to employed research perspectives. In the case of regional analysis, it has been argued that innovation support should not favour large enterprises, but rather assist those enterprises that experience difficulties in gaining access to venture capital, that is basically small and medium-sized enterprises in labour-intensive industries with a high employment potential (Cooke and Morgan 1998: 204).[313] A decentralised regional innovation policy would focus on the domains of vocational training, innovation networks, business intelligence services, and environmental sustainability (Cooke and Morgan 1998: 219n). Yet, in addition to that point of view, it has been suggested that production activities of multinationals may indeed drive economic development, especially in small developing economies. The corresponding innovations may set up local linkages and hence stimulate a "secondary wave of activity" in Schumpeterian terms. Even in primarily export-oriented industries with a low content of local suppliers, related effects may be observed, for instance concerning efforts in the training and education of the local workforce (McKee 1991: 124n). Accordingly, the attraction of foreign direct investment emerges as a device for innovation polices, denoting multinational enterprises as partners in local development which need to be nurtured by adequate locational advantages.

In view of that, interactions between the private and the public sector need to be strengthened, focusing on linkages between the functional poles of invention, innovation and finance. Arrow's welfare theoretical arguments on the rationale of technology policy in market economies had suggested that private underinvestment in inventive activity, resulting from externalities, would raise a demand for public support (Arrow 1962: 623). However, the reconsideration of institutional dimensions leads to the assessment of more refined options. It has been suggested that externalities from R&D need not necessarily induce subsidies, as institutional networks may allow for an internalisation of externalities. Concerning the case of R&D, industrial associations, decentralised company structures and industrial clusters are distinguished as devices for coordination (Weder and Grubel 1993: 492n). This argumentation shall support the case for regional policies as an alternative to market intervention, concentrating on the stimulation of cooperative institutional networks among local enterprises, accompanied by the formation of industrial clusters (Weder and Grubel 1993: 508n). Accordingly, the

[313] Furthermore, small and medium-sized enterprises often exhibit deficits in establishing network relations with other firms. This may hint at a lack of trust and social capital, that is the historically and culturally conditioned ability for spontaneous co-operation between economic agents; factors which can not be nurtured by means of public policies. For example, findings from a standardised survey of innovation capabilities in South Tyrolian manufacturing industries have underlined the correspondence of inter-firm cooperation, innovation and economic performance (Ebner and Perkmann 1999: 25n).

suggestion holds that polices in support of innovation should aim at correcting market failures in the area of social capability, instead of granting routine investment subsidies (Crafts 1996: 44).

Similar conclusions apply to the branch of technology policies. Arrow suggested that public support of invention should proceed until expected marginal social benefits equalise marginal benefits in alternative uses, conditioned by the qualification that uncertainty may impede reliable calculations. Hence only experience could assist in the estimation of future returns (Arrow 1962: 623n). Apart from the knowledge- and preference-related problems of identifying a social welfare function, this argument remains unconvincing in the context of radical change, when experience loses its habitual impact on the formation of expectations. In this case, entrepreneurial initiative becomes decisive in shaping the expectations of economic agents. However, neither market allocation nor government intervention may exclusively solve the associated coordination problems. This aspect of uncertainty applies more specifically to the case of junctures in structural change which breed the policy problem of choosing among alternative investment programmes that would drive specific technological trajectories and related development paths. The relationship between government and market agents may become crucial for proceeding with these choices. Indeed, both innovation and coordination effects may be propelled by a moderating as well as consultative function of government, acting within a network of economic agents from the private and the public sector.

This is exemplified by deliberation councils which have been widely instituted in the East Asian economies, contributing to concerted policy efforts in education, training and technology assimilation (Justman and Teubal 1991: 1178n). The Japanese government, for instance, repeatedly attempted to promote certain industries by setting incentives that would signal further efforts in nurturing their development. An example is the public announcement of certain "visions" on the future prospects of selected technologies and industries, put forward by special councils that were set up as bodies of communication, representing the private sector, the public sector and government. This practice is vulnerable concerning the rent-seeking strategies of bureaucrats and the collective action of special interest groups; still, it demarcates the terrain of conflicts and delineates possible compromises (Odagiri and Goto 1996: 262n). Deliberation councils, which have also become a prominent feature of innovation policies in East Asia, thus contribute to knowledge flows and information exchange, reducing transaction costs by building reputation and trust. Hence, they support the institutional foundations of embedded entrepreneurship, both in terms of the functions of innovation and coordination.[314]

Still, the generation of expectations regarding the adoption and assimilation of certain technologies may promote self-fulfilling prophecies, merely contributing to the realisation of those visions that had been proposed by government agencies, instead of facilitating a knowledge-based dialogue (Justman and Teubal 1991: 1180n). In this case, the responsiveness of policy orientation to market signals, mediated by these councils,

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[314] The hierarchical approach that characterises theories of the developmental state has been criticised for misrepresenting coordination as a crucial factor in the interactive relations between government and the private sector, with deliberation councils serving as intermediaries (Aoki et al. 1997: 3n). Moreover, long-term relationships that provide sufficient gains from cooperation for private sector entrepreneurs, while also allowing for competitive behaviour, have been marked as necessary conditions for collective learning, involving governmental learning in the orientation of its policies (Stiglitz 1996: 163n). This corresponds with the thesis of an "embedded autonomy" of state bureaucracies in social relationships, providing knowledge that is needed for achieving the indispensable corporate coherence and connectedness of the developmental state in implementing innovation policies (Evans 1995: 12n).

becomes crucial, involving the terrain of political governance as a selection environment.[315] Accordingly, public procurement policies have been perceived as a strategic variant to subsidies and market interventions, allowing for the persisting impact of competitive market dynamics on the course of technological evolution (Dunn 1995: 178). This policy orientation could imply that government-related agents would act like a "political entrepreneur", exercising a coordination function in the course of entrepreneurial search and discovery processes that reach beyond the confines of a constructivist "pretence of knowledge" in Hayekian terms. In order to grasp the trends and currents of technological evolution, government becomes a cooperative organiser rather than an authoritarian guide of technological search (Gerybadze 1992: 170n). The problem of lock-in regarding the path-dependent diffusion of inferior technologies, which eliminate potentially superior alternatives due to increasing returns to adoption and network externalities, then underlines the need for a sustained competition among technological alternatives (Metcalfe 1995: 496).

According to Schumpeter, the carrying out of entrepreneurial functions by government agencies had been primarily relevant in the early phases of industrialisation, especially in countries with a decidedly mercantilist orientation in stimulating local manufacturing industries. In this account, the state may temporarily play an entrepreneurial role either actively and directly by the establishment of public and government-related enterprises, or indirectly by facilitative policies, focussing on physical infrastructure and the legal system. This mercantilist motive has been modified in late industrialising economies, especially in East Asia, where temporary market intervention seems to excel in the repertoire of industrial policies. Therefore, in dealing with the functions of an entrepreneurial state, two modes of carrying out the entrepreneurial function may be distinguished. First order entrepreneurship may denote the initiation of new paradigms by means of market intervention, either in terms of the generation of new technologies or in terms of the assimilation of existing technologies that are put to use in a new context. It is oriented at supporting evolutionary disruption and structural change, subsumed under the Schumpeterian concept of creative destruction. Second order entrepreneurship may cope with the economic order that frames the evolutionary process by institutional incentives and constraints. Principally, this points to the legal system, market regulation, education and infrastructure, meant to promote the adoption and stabilisation of a new paradigm.

As a complementing perspective, the policy functions of innovation, as derived from Schumpeterian arguments, would consist of technological and institutional agenda setting. This implies temporarily a position of cognitive leadership regarding the identification of paradigmatic technological opportunities, yet organised in a manner that involves the participation of the private sector, thus safeguarding the impact of competitive market dynamism. Moreover, leapfrogging qualities in infrastructural investment belong to that category, serving as a condition for continuous learning and technological upgrading which remains unimpeded by infrastructural deficits. In particular, the knowledge infrastructure may support research strategies in R&D. Policy functions of coordination, resembling Kirznerian entrepreneurship, then may be carried out by supporting knowledge flows concerning technological opportunities, that is, for instance, by the provision of market-related information. In this case, entrepreneurial learning may contribute to a secondary wave of entrepreneurship, also driven by the

[315] An illustration of these problems is provided by the Japanese preparation of explorations in the future development of specific technologies, referring to an assessment by practitioners both from the scientific and business communities. Findings shape the formulation of innovation assistance schemes and other instruments of technology policy.

public support of R&D ventures, especially in the areas of product innovation and design. However, innovation policies primarily need to take notice of the fact that innovation proceeds in diverse settings. Hence, recognising the interdependence of the technological, organisational, institutional and spatial aspects of innovation and economic development remains an indispensable condition for the design and implementation of reflexive innovation policies.[316]

The entrepreneurial generation and absorption of innovations seems to constitute a decisive reason for the comparative success of novelty-embracing market economies. This amounts to suggesting that capitalist market economies benefit from comparative institutional advantages, reflected by systems of innovation which make available a framework for the articulation of entrepreneurship, channelling and shaping entrepreneurial impulses which are translated into innovations as the driving force of economic development. The key role of markets in that process has been repeatedly confronted with development planning, involving the calculation of innovations by planning administrations. With regard to these aspects, the East Asian development experience may contrast most favourably with the Soviet model of capital accumulation and economic growth.

A case in point proceeds as follows. Joan Robinson, the famous Cambridge economist of Keynesian conviction, visited the Korean peninsula in 1964. Indeed, she portrayed Korea as an outstandingly successful development model: "All the economic miracles of the post-war world are put in the shade by these achievements. (...) The credit must go to well conceived economic strategy and to patriotic rage and devotion expressing itself in enthusiasm for hard work" (Robinson 1965: 208n). These statements seem to provide an early example of ongoing debates on the East Asian economies. They underline the exceptionality of the tremendously rapid catch-up process of these economies. However, in this case, Joan Robinson referred not to South Korea, as one might assume from the present point of view. She referred instead to North Korea, hailing Kim Il Sung as the architect of economic success, and thus claiming that "the North continues to develop and the South to degenerate" (Robinson 1965: 215).[317] In retrospective, then, these statements provide impressive evidence for the factual backwardness of South Korea in the early 1960s, and thus for the even more impressive growth and development process that was subsequently experienced by this economy during one generation only.

Indeed, the case of the Soviet Union and other socialist economies that subscribed to administrative planning has shown so far that entrepreneurship in all its forms of manifestation remains crucial for the development process, whereas planning bodies do not represent an adequate substitute. With regard to this matter, it may be argued that Schumpeter supposedly overestimated the potential for bureaucratisation and routine innovation. However, catching up with the technology and productivity levels of the capitalist economies had been a major Soviet policy motive ever since the October Revolution of 1917, suffice to mention Lenin's admiration for Taylorist scientific management and Fordist mass production (Hughes 1990: 249n). In order to close the technology gap, governments of socialist economies usually supported the expansion of

[316] This applies also to the matter of regional economic agglomerations in terms of industrial clusters or industrial districts, which may be rooted both in technological and pecuniary externalities that contribute to the geographical concentration of industrial activity. Still, the problem prevails how to implement a policy for the formation of industrial clusters and districts (Krugman 1993b: 176n). To a high degree, the latter seem to result from spontaneous processes of self-organisation as well as from path-dependent evolutionary change.

[317] These seemingly naive positions have not been unusual for left leaning Western academics commenting on socialist experiments, just to mention the apology of Stalinism by the Webb in the 1930s.

R&D. During the late 1970s and early 1980s the volume of R&D operated in the actually existing socialist economies equalled about one-quarter of global R&D activities. Nonetheless, their innovation performance remained poor, as the net import of technology licenses prevailed (Gomulka1986: 42n).

It may be proposed that the lack of entrepreneurial activities which could have transformed technological inventions to productive innovations has been largely responsible for that failure. In actually existing socialism, enterprises resembled the executive organs of planning bodies. Academy-industry relations remained weakly developed as well, as did user-producer relations and the corresponding modes of interactive learning between firms and industries. R&D was mainly operated outside the firm, facing vertical hierarchies and horizontal industry and branch segmentation which was typical of the Soviet style system of planning and administration. Science, technology and production remained basically separated, with the major exemption of industries that were directly relevant for military purposes. Hence, the Soviet type of innovation system followed a rigid science-push approach with hierarchically centralised structures (Radosevic 1997b: 376n). This resulted in capital accumulation without learning effects, leading to economic stagnation and decline (Nelson and Pack 1999: 199).[318]

In contrast to that, the dynamism of economic growth and development which has characterised the East Asian economies, that is principally Japan as well as South Korea, Taiwan, Hong Kong and Singapore from the 1960s up to the 1980s, seems to represent an outstanding developmental success of capitalist market economies. According to the World Bank, private investment and human capital served as engines of growth, framed by a sound macroeconomic framework and systematic policy interventions. Capital accumulation, efficient resource allocation and technological catch-up were accordingly promoted by a mixture of competitive market processes and supporting policies (World Bank 1993: 5n). Still, it has been argued that the impressive record of the East Asian growth performance so far does not imply the stimulation of a sustained process. In accordance with neoclassical growth theory, so the argument proceeds, the accumulation of input factors is subject to diminishing returns, hence input-driven growth inevitably loses its dynamism during the growth process, over time entering a steady state. In other words, a sustained increase in per capita income requires a rise of output per unit of input, to be achieved primarily by technological advance in terms of an increasing efficiency in resource use. Krugman has even claimed that the input-driven growth pattern of the East Asian economies resembles the Soviet growth performance, lacking from a significant contribution of total factor productivity to output growth (Krugman 1994b: 70n).[319]

Even a qualified overview of recent growth accounting shows that the growth contributions of total factor productivity in the East Asian newly industrialising

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[318] Accordingly, it has been suggested that development strategies in post-socialist economies should mobilise the entrepreneurial potential of regions, affecting patterns of R&D, private-public partnerships, and mediating organisations (Radosevic 1997: 381n). This type of policy might preserve the critical degree of institutional variety, quite in accordance with the evolutionary thesis that institutional homogenisation leads to short-run adaptations at the cost of weakening long-run adaptability (Grabher and Stark 1997: 1n).

[319] Young, in particular, has claimed that East Asian growth rates reflect the accumulation of labour and capital, facilitated by significantly increasing workforce participation rates and investment rates both in aggregate terms as well as in the manufacturing industries. This argument opposes applications of the Kaldor-Verdoorn thesis, which refer to an East Asian growth "miracle" in which total factor productivity gains resulted principally from outward-orientation, that is, from the export performance of manufacturing industries (Young 1994: 972n).

economies have been substantially lower than in the comparable case of the Japanese economy. However, they have still outperformed the Latin American economies (Masuyama 1997: 4). Moreover, unlike Latin America in the 1980s, East Asia experienced no significant reversal of total factor productivity growth. The comparatively low growth contributions of total factor productivity then may hint at a persisting potential for technology assimilation (Collins and Bosworth 1996: 161; 190). Indeed, the thesis of factor accumulation counters the argument of an outstanding role of innovation and learning during the recent decades of East Asian development. Yet several methodological problems apply, primarily regarding the measurement of physical capital and the concept of total factor productivity. The latter is interpreted as a residual that mirrors formal identities which are constructed in accordance with the neoclassical production function approach, related to assumptions on market competition and the analytical separation of factor accumulation and technological innovation (Felipe 1999: 6n). Thus it has been claimed that these theoretical underpinnings of the concept of total factor productivity coin assumptions that influence related empirical procedures, hence reducing the potential for generalisation as well as for policy recommendations which have interpreted low output growth contributions of total factor productivity as an indicator of ill-conceived industrial policies (Felipe 1999: 24n).

In any case, Krugman's position remains on the aggregate level of analysis, ignoring the institutional underpinnings of the growth process that would be decisive for a comparative assessment of the Soviet model and East Asian industrialisation. In addition to the matter of market competition and the role of government, various motivational and organisational as well as technological factors need to be taken into account. In other words, differences in economic style between these formations need to be examined. Accordingly, the question of the historical specificity of the East Asian development experience has stimulated debates which reconsider its institutional underpinnings. The relevance of differing capitalist cultures has been taken into account, delegating a special role to the cultural value-system of Confucianism and its impact on institutional as well as organisational aspects of the economic process in the East Asian newly industrialising economies (Fukuyama 1995: 49n). Confucianism has been generally appreciated as a learning culture, endowed with "cultural genes" that promote the ability to acquire and apply knowledge, combined with an encouragement of role-guided ethical behaviour (Röpke 2001: 54n). For instance, regarding the outstanding role of the Japanese education system in the provision of human capital, it has been argued that its meritocratic and competitive character mirrors a specific blend of Confucianism that appreciates the status-related implications of education (Morishima 1982: 17).

These arguments on the cultural determinants of economic development have been criticised for a lack of attention towards allocation mechanisms, in particular regarding the impact of markets as the crucial institutional ensemble of the development process. Olson, among others, has argued that it is not culture, but the proper functions of the market process that drive economic development, as indicated by the historical experiences of Western and Eastern Germany as well as South and North Korea, exhibiting common cultures with different economic systems (Olson 1996: 19n). From a similar angle, despite the acknowledgement of cultural specificity, the East Asian development experience has been attributed to high savings and investment rates, based on efficiency in the market allocation of resources, quite in accordance with international factor price relations (Lal 1998: 137n). In this context, cultural aspects like Confucianism may enter the argument in terms of a family-oriented value-system that

induces high savings of households, to be expressed formally through variations of the rate of time preference in the utility functions of individual optimisers. However, the neoclassical causality of savings and investments is empirically inconclusive, hence it may be theoretically reversed, as in Schumpeterian and Keynesian approaches. Furthermore, these simplistic arguments on the economic impact of Confucianism offer only limited single-factor explanations of economic behaviour. Apart from misrepresenting cultural diversity, they do not account for the historical evolution of cultural values, their differentiation and segmentation. Indeed, earlier analyses of cultural influences on economic development even highlighted Confucianism as a development barrier.[320]

In order to overcome these conceptual deficits, it is necessary to point at the role of institutional variety in modern capitalism, which allows both for market-centred arguments and a reflection of cultural diversity in shaping economic behaviour, subject to evolutionary change. This applies also to analyses of the role of government in East Asian development, reaching beyond the motives of market allocation and cultural determination. Indeed, the role of the state in supporting economic growth and development has been explored with regard to the forms and functions of government-economy relationships, taken as a representation of institutional patterns that have been observed in East Asian countries (Aoki et al. 1997: 24n). An exploration of these patterns, however, needs account for the diversity of country-specific structures and policy models.[321] Thus it has been claimed that the catch-up growth process of the East Asian economies owes much of its success to the institutional set-up of the corresponding national systems of innovation. Despite variations, these systems have been marked by common properties, to be summed up as follows: an expanding education system with an emphasis on tertiary education and engineering, a rapid growth of business in-house R&D, a share of industrial R&D above 50 per cent of gross expenditures on R&D, a rapid development of science and technology infrastructures, heavy investment in advanced telecommunications. The growth of export-oriented electronics industries then enabled local firms to participate in international technology networks (Freeman 1996: 178).

This hints at the character of innovation in East Asian economies, reflecting the matter of technology assimilation. Regarding the innovative content of the latter, Hobday has indeed argued that "patterns of imitation demonstrate corporate creativity and result in competitive advantage, bringing about industrial transformation and development" (Hobday 1995: 194). Hence, the East Asian economies are subject to innovation in terms of technology assimilation and structural change. Nonetheless, the corresponding development trajectories are in need of further entrepreneurial impulses, basically

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[320] Max Weber, for instance, portrayed Confucianism in China as an impediment to the evolution of an economic system that would resemble the dynamism of occidental capitalism, based on rationalism in legal, economic and political affairs. Moreover, a Chinese Confucian gentleman was not designated to set up a business firm, due to a status-oriented, conservative despise for the purpose of money-making in economic affairs (Weber 1915-19/1920: 448n).

[321] Some of the various structural and institutional differences among these countries have been accentuated as follows. South Korea exhibits industrial structures that are dominated by locally owned large enterprises, accompanied by intense government intervention and a comparatively low degree of openness to foreign direct investment and imports. Taiwan displays a structural pattern of small local enterprises and large foreign enterprises, accompanied by low degrees of government intervention as well as low degrees of openness to foreign trade and investment. Hong Kong also exhibits a dominance of small local enterprises and large foreign enterprises, accompanied by low degrees of government intervention, yet high degrees of openness to foreign investment and trade. Singapore is characterised by the dominance of large foreign enterprises and high degrees of government intervention, openness to foreign trade and foreign direct investment (Hobday 1995: 196n).

regarding the evolution of capabilities in R&D and product innovation, stimulating a self-sustained growth pattern in approaching the technological frontier (Hobday 1995: 200n). This may even allow for the emergence of capabilities in the generation of radically new technologies as a condition of productivity leadership. With regard to this perspective, it has been claimed that Japan remains a role model in the design and implementation of innovation policies for sustaining economic development (Fransman 1995: 95n). Correspondingly, Japanese economic development has been portrayed as the result of a distinctly Schumpeterian strategy of supporting industrial transformation by public policies (Scherer 1992: 1426).

Innovation policies need to account for the stimulation of entrepreneurial activities, while considering the underlying economic functions and the variety of agents who carry them out. This is well illustrated by the case of East Asia, where entrepreneurship is represented by a broad array of organisational forms and institutional modes, reflecting the specificity of the embedding context, that is, a particular economic style. Entrepreneurial contributions to the East Asian development performance have included the coordination aspects of market making and network building, as well as the innovation aspects of technological change (Mackie 1999: 83). Corresponding carriers of entrepreneurship then comprise of the family-oriented small and medium enterprises in manufacturing industries as well as the transnational business networks and conglomerates of Overseas Chinese, including operations in banking and financial services (Mackie 1999: 72n). Moreover, as in the case of Singapore, multinational enterprises may introduce novelty into the local economic system, contributing to the development process by technology transfer and skills formation. Yet included in the sample of entrepreneurial agents is also the public sector, that is principally public enterprises and government-related enterprises, as well as government boards which may enforce and coordinate innovation-driven economic change, thus also attempting to induce related initiatives in the private sector (Ebner 2003a).

Accordingly, it has been argued that innovation policies in East Asia could be perceived as the manifestation of an entrepreneurial state which promotes developmental visions and industrial strategies that contribute to the evolution of an internationally competitive production potential in local industries (Röpke 2001: 21). Therefore, the entrepreneurial state still belongs to the key agents of economic development in East Asia, although ongoing institutional and structural changes may contribute to its further substitution by entrepreneurial agents emerging from the private sector. Network relationships which have contributed to the design and implementation of innovation policies are also a part of the changing institutional landscape. The case of the Asian financial crisis in the late 1990s, which uncovered underlying problems of institutional rigidities and rent-seeking phenomena in various countries, may exemplify this aspect. However, the various modes of carrying out entrepreneurial functions are to be perceived as representations of specific economic styles, that is, as institutional, organisational and technological patterns of economic activity which are characteristic for the development path of countries or regions.[322] Thus, changes in the institutional foundations of entrepreneurial

[322] A differentiation of related styles in the East Asian economies may illustrate that argument. Yoshihara has argued that, in contrast to the evolution of capitalism in Northeast Asia, a style of "ersatz capitalism" has evolved in Southeast Asia. It is characterised by a weak domestic technology base and bureaucratic patronage relations, for instance reflecting rent-seeking strategies of "crony capitalists" and other government-connected economic agents (Yoshihara 1988: 68n). The result is a pattern of "industrialisation without development", that is without building adequate technological capabilities, reflecting a lack of private sector entrepreneurship in innovation, as well as a technological dependence on foreign suppliers, primarily the subsidiaries of multinational enterprises (Yoshihara 1988: 111n). The decisive challenge for innovation policies would principally lie in the stimulation of local entrepreneurial

states are conditioned by the dynamism of local changes in the evolution of the related economic styles.
This position implies that development strategies of innovation policies need to account for the institutional limits of policy-making. Indeed, problems in the stimulation of entrepreneurship, as an outstanding feature of related efforts, have been interpreted most appropriately in the spirit of the economic style perspective. Thus it has been maintained that the Schumpeterian perspective implies that an encouragement of economic growth by inscribing a role for the entrepreneur in a socio-economic order which lacks the historical and institutional patterns that produce entrepreneurship would be naive at least. Such a constructivist strategy would deny the historically conditioned identities that are prevalent within a national or regional economy (Dyer 1988: 40).
Both with regard to the prospects and limits of innovation policies, thus, embedded entrepreneurship retains its functions in dealing with novelty and uncertainty as the key features of economic development.

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potential, accompanied by the formation of institutions and organisations that support technology assimilation through capability-building.

12 CONCLUSION

The preceding chapters aimed at a theoretical reconstruction, conceptual modification and policy-oriented application of Schumpeter's approach to the relationship between institutions and innovation in economic development. Along these lines, the exposition concentrated on an assessment of the institutional aspects of the Schumpeterian perspective, focussing on the matter of entrepreneurship and innovation which was also discussed in the context of those approaches that contributed to the formation of the Schumpeterian research programme, or received further impulses from its conceptual substance. The core of the Schumpeterian perspective lies in the perception of modern capitalism as an economic process which revolutionises production structures and consumption patterns due to the introduction of innovations, that is basically new production processes and products. The competitive mechanism of creative destruction then implies a restructuring of firms and industries as well as social positions. In order to clarify this argument, Schumpeter suggested that economic growth would denote gradual change in an economic system, resulting from external factors such as population growth, whereas economic development should denote discontinuous change, endogenously driven by clusters of innovation that would induce business cycles as the typical contours of capitalist development. Indeed, this argumentation reflected the fundamental conceptual relations in Schumpeter's theorising, principally the circular flow with its equilibrium orientation as distinct from evolutionary change in economic development, paralleled by the behavioural types of adaptive and creative economic agents.

In dealing with a reconsideration of seemingly paradoxical positions regarding these theoretical and methodological subjects, which involved an array of diverse theoretical influences, the suggestion was made that a recognition of Schumpeter's relationship with the Historical School could contribute to a workable solution. Indeed, the underlying thesis suggested that this relationship would provide further insights for an assessment of the institutional orientation of the Schumpeterian perspective. This discussion was initially associated with an appraisal of the Schumpeterian approach to economic sociology as a technique of economic analysis that would deal with institutions and economic behaviour, thus continuing with the historist tradition. Regarding the developmental implications of the corresponding research program which had shaped the analytical orientation of the German Historical School, denoted as the "*Schmollerprogramm*" by Schumpeter, again the constitutive role of institutions was highlighted, pointing to the evolutionary and ethical dimensions of economic change. Contrasting with the related notion of evolution as a process of organic growth, Schumpeter's notion of economic evolution resembled a discontinuous process, driven by the introduction of novelty. Complementing the microscopic aspect of evolutionary discontinuity, however, Schumpeter also acknowledged macroscopic continuity in economic development, subject to a historical perspective.

Furthermore, Schumpeter shared a concern with the institutional foundations of modern capitalism that was propagated by the Youngest Historical School, that is basically Max Weber and Werner Sombart. An essential concern was provided by the notion of rationalisation in capitalist development, promoting a Marxian idea that was also put forward by Schmoller, according to which capitalism would tend to undermine its institutional foundations by means of its economic success. Schmoller had introduced the notion of the "machine age" as a label for industrialisation, emphasising the role of technological innovation in the production process, while entrepreneurship was viewed

with ambiguity, due to its socially disruptive effects. However, specific attempts in sorting out the institutional and technological characteristics of modern capitalism prevailed with Youngest Historical School, countering stages theories of economic development that had neglected the historical specificity of economic formations which were to be understood by theoretical as well as historical means.
Weber's study on the protestant ethic and the spirit of capitalism approached modern capitalism as a historical individual, that is a complex of relations in historical reality, to be subsumed categorically regarding their cultural meaning. Systematic rationalisation in capitalist development became manifest in the figure of the Weberian entrepreneur, who was not a heroic adventurer but a rational professional, although his role in economic organisation was associated with the persistence of charismatic leadership. Sombart's scheme of economic systems then pointed at capitalism as a coherent configuration of economic institutions, organisations, and technologies, as distinct from pre-capitalist systems. Based on the notion of a capitalist spirit of unbound accumulation, Sombart interpreted entrepreneurship as a driving force of capitalist development, combining rational calculation with adventurous heroism. Capitalist technology would achieve higher productivity through applications of science to production, as technological change became an endogenous component of the economic process, subject to economic calculation and administrative routine. In addition to these positions, Spiethoff's approach to historical theories was expressed by the notion of economic styles, approaching the essential characteristics of an economy, like predominant economic attitudes, socio-economic structures, technological aspects, and the endogenous dynamism of economic growth and development. Economic styles should reflect coherent ensembles of interdependent elements, depicting the underlying historically-conditioned causal relationships.
Deviating from references to a capitalist spirit as an epochal phenomenon, Schumpeter's definition of modern capitalism highlighted a private property economy in which innovations would be carried out by means of borrowed money, usually implying credit creation. Still, individual Kondratieff cycles would exhibit specific technological and institutional features . These were also related to distinct phases of capitalist development, then abstracting from the business cycle scheme. The advent of capitalism as a dominant economic system was settled in the middle of the 18th century, breaking ground for competitive capitalism in the 19th century and trustified capitalism in the 20th century. In this context, Schumpeter suggested that capitalism evolved from the institutional substance of preceding formations, adding to an institutional variety that was accordingly accentuated as a principle of economic development. This position made Schumpeterian capitalism appear as an amalgamation of extra-capitalist and capitalist components, so that upholding institutional variety would constitute a crucial condition for sustaining the dynamism of capitalist development.
The crucial role of institutions was also mirrored by the distinction of specific functions that needed to be put into effect in the development process. The core relationship in that perspective was constituted by the entrepreneurial introduction and the capitalist financing of innovations, accompanied by the originally exogenous function of invention that was increasingly endogenised during the evolution of the capitalist economic system. In the corresponding institutional order, the elements of capitalist rationality were represented by the functions of finance and invention, whereas entrepreneurship was related with irrational components. Indeed, the Schumpeterian figure of the entrepreneur who would carry out innovations that drive economic development, exhibited behavioural features that were rooted in the extra-capitalist domain.

The reconstruction of Schumpeter's approach in the theory of entrepreneurship then proceeded with the thesis that two broad conceptual strands in dealing with entrepreneurship could be differentiated, namely, those that would point to the carrying out of innovation and those that would refer to the coordination of economic processes. In this sense, Schumpeter attempted to combine historical and institutional concerns with an exploration of economic causality. Hence, the conceptual impact of the German Historical School was paralleled by references to Austrian theorising on the entrepreneurial function, including sociological aspects. Within neoclassical marginalism, entrepreneurs were styled either as Walrasian arbitrageurs or as Marshallian managers, promoting price or quantity adjustments in market exchange as a condition of equilibration. In contrast to that, the Austrian School approached entrepreneurship as a dynamising factor in the economic process. Menger's approach to entrepreneurship focused on the intertemporal coordination of the factors of production, in which the entrepreneurial position depended on market knowledge. Wieser expanded that position by introducing institutional concerns with economic power in modern capitalism, reflected by the pioneering leadership of innovators as driving forces in economic development and industrial evolution. This was the essence of the Wieserian sociology of leadership that was adopted in Schumpeter's theorising.

Schumpeter then approached entrepreneurship as the historically conditioned internal factor of economic development. Ordinary types of economic agents would exhibit a habitual and routine-guided type of behaviour, motivated by hedonistic schemes, and coping with economic change in terms of an adaptive response. The entrepreneurial type, however, would come forward as the carrier of creative response, based on a novelty-embracing type of behaviour that was motivated by visionary imagination, exercising leadership in discontinuous change. The corresponding entrepreneurial motivation should deal with profits as means to achieve further ends, principally oriented towards the construction of a family-empire. However, the emphasis on atavistic values, reflecting institutional variety as a condition of evolutionary change, belonged to the core of the Schumpeterian research agenda. Schumpeter indeed suggested that industrial concentration and trustification would result from atavistic instincts of struggle and leadership, also to be identified as motives of nationalism and imperialism.

Thus, the logic of Schumpeterian entrepreneurship was not associated exclusively with the institutional setting of capitalist market economies, for it represented a general principle, relevant for different historical formations and cultural areas. Its historicity was described by the proposition that the universal nexus of novelty and leadership would manifest itself through a variety of historically conditioned institutional carriers. This entrepreneurial embeddedness in a historical rooted variety of institutional forms then allowed for an extension of the conceptual range of entrepreneurship, proceeding from the small business entrepreneur to the entrepreneurial agent in the large corporation, while augmenting entrepreneurial capabilities with problems of cooperation. This conceptual specification was related to specific phases of capitalist development, basically described as competitive and trustified capitalism with the latter paving the way for a socialist system in which the entrepreneurial function could be exercised by the government. However, Schumpeter claimed that government had influenced capitalist development through all of its phases, especially during the early periods of industrialisation, basically by setting up public enterprises in industries that would introduce innovations. Moreover, a conditioning of the economic process through the shaping of institutional and physical infrastructures was also perceived as a relevant case of entrepreneurial activities of the state.

With these arguments, the exposition shifted towards a comparative exploration of theories of entrepreneurship, highlighting primarily Austrian and evolutionary approaches that accounted for Schumpeterian positions, yet attempted to complement their analytical range. While Schumpeterian entrepreneurship pinpointed the introduction of novelty into an economic system, inducing disequilibrium and evolutionary disruption, modern Austrian theory in the tradition of Mises and Hayek approached entrepreneurship as equilibrating market coordination. Indeed, the Austrian entrepreneur should contribute to the decentral coordination of the subjective plans of economic agents. Mises' theory of human action, in particular, formulated universally valid principles of human behaviour, dealing with individual choices on the allocation of scarce resources according to alternative ends-means frameworks. Mises' apriorist perspective, attributed qualities of entrepreneurship to all economic agents who would participate in the equilibration of market constellations; a concept of entrepreneurship that was explicitly distinguished from the notion of pioneering leadership formulated by Wieser and Schumpeter. Hayek complemented these positions by promoting the concept of subjective knowledge in market competition, which included the Misesian type of entrepreneurship in equilibrating coordination.

As a variant of modern Austrian theorising, Kirzner's market process theory proceeds with these arguments by underlining subjectivity and uncertainty in knowledge coordination. The corresponding type of entrepreneurship is concerned with the discovery of unexploited profit opportunities, that is basically with arbitrage procedures. Accordingly, entrepreneurial alertness has been presented as the underlying characteristic of entrepreneurial behaviour, including both intended search as well as unintended, spontaneous discovery as an equilibrating force. The notion of bounded uncertainty should constitute a basis for modelling individual choice, shaped by the emergence of regularities in the market process. According to the Kirznerian standpoint, specifying the sources of economic growth and development would imply a recognition of the entrepreneurial discovery of new opportunities for economic activity, as conditioned by the competitive market processes.

The related perspective of evolutionary economics claims that economic development needs to be viewed as a process evolving in historical, irreversible time, driven by the generation and diffusion of innovation, that is by novelty and learning. The individualist view on evolutionary economics then focuses on the level of individuals, where innovations are discovered, implemented and adopted. Consequently, entrepreneurship is portrayed as an individual type of economic behaviour, whereas variants of that approach have modelled diverse entrepreneurial types that are associated with distinct market structures and industrial life cycle patterns. However, behavioural strands of the evolutionary position have maintained that routines need to be recognised as guiding principles of economic behaviour, thus pronouncing the organisational aspect of firms in market competition and economic growth. Routines then denote characteristics of firms in a wide range of applications, like production routines and search procedures for innovation, constituting heuristics that shape the identification and solution of problems in the economic process. During that discussion, an evolutionary model of local technology search was presented, based on a formalisation by Nelson and Winter. In view of that model, it was concluded that an assessment of entrepreneurship would remain marginal in the behavioural perspective, due to its analytical emphasis on organisations and systems.

In addition to the concern for market processes and evolutionary change, the specific problems of entrepreneurship in developing economies was taken to the fore. Summarising a controversy on the applicability of Schumpeterian ideas to the

institutional setting of these developing economies, it was proposed that Schumpeter's approach remained relevant, for it would allow for a variety of entrepreneurial agents, including government. Moreover, a perception of technology assimilation as an entrepreneurial process, understood as the principal source of innovation in developing economies, would be in agreement with Schumpeterian ideas on innovation. Coping with the matter of industrialisation and industrial evolution then pointed to Leibenstein's view of entrepreneurship as input completion, accompanied by Casson's discussion of the market making entrepreneur, who exercises coordination functions in a setting of asymmetric information and transaction costs. Indeed, the institutional environment markedly influences the formation and articulation of entrepreneurial capabilities. However, given the interdependence of cultural and economic domains, it was argued that a diversity of cultural patterns would be reflected by various entrepreneurial types, essentially associated with the functions of innovation and coordination. A related typology of entrepreneurship was meant to explore these concerns.

A comparison of Schumpeterian entrepreneurship with the Kirznerian approach, perceived as a synthesis of Austrian positions then provided the point of departure for designing a typology of entrepreneurship. At first, differences in Schumpeter's and Kirzner's research agendas were highlighted, namely the Schumpeterian concern with the endogenous source of business cycles, as compared with the Kirznerian focus on the determinants of price formation in market competition. In contrast to the Schumpeterian focus on radical innovations that change the cost structures of an entire economy, the Kirznerian understanding of the market process refers principally to moderate types of economic change. Subsequently, the disequilibrating Schumpeterian entrepreneur, whose innovations cause radical uncertainty in the Knightian sense, was contrasted with the equilibrating, uncertainty-reducing Kirznerian entrepreneur. The consideration of complementary effects then arose from the viewpoint that the innovations of Schumpeterian entrepreneurs induce evolutionary change, in particular expressed by price differentials which become arbitrage opportunities for Kirznerian entrepreneurs, who act as equilibrating market forces by contributing to their gradual erosion. In other words, Schumpeterian entrepreneurs create opportunities for economic development by expanding the existing production potential, while Kirznerian entrepreneurs make use of that expansion, including shifts in the pattern of demand.

It was concluded that the range of Schumpeterian innovation, with its proliferation of new profit opportunities, would define the terrain for the search and discovery procedures that characterise Kirznerian entrepreneurship. These procedures exhaust the development potential of Schumpeterian innovations by exposing them to trial-and-error experiments in the market process. The relationship between Schumpeterian and Kirznerian entrepreneurship is thus marked by functional interdependence. In summary, it was suggested that Schumpeterian entrepreneurship deals with radical change by innovation-oriented leadership while Kirznerian entrepreneurship deals with moderate change by coordination-oriented alertness. In a broader sense, innovation then points to the matter of establishing new markets, industries and areas of economic activity, whereas coordination is concerned with the discovery of opportunities for market expansion and completion, including the realisation of arbitrage opportunities and the reduction of transaction costs.

With reference to that typology of entrepreneurship, the matter of entrepreneurship was discussed with reference to the subject of technology. Indeed, the complexity of technology, denoting types of knowledge as well as the corresponding artefacts, exceeds Austrian positions on the market process, and even Schumpeter did not deal with the

matter of technological evolution in terms of differentiated concepts. Accordingly, it was argued that these kinds of concepts could be made available by pointing to Kuhn's notion of the scientific paradigm, dealing with novelty in scientific progress. Transferred to the domain of technology, Dosi's notion of the technological paradigm, defined as a set of search procedures and solution patterns for technological problems, should principally deal with an explanation of radical innovations. Under the influence of the dominant paradigm, further innovations would exhibit a more incremental character, as paradigms delineate the opportunity space for the decision-making of economic agents, allowing for coordination in a structured context with reduced uncertainty. In particular, it was argued that a Hayekian kind of pattern prediction on technological evolution would become feasible in terms of a prediction of the general attributes of certain structures without specific statements on their elements, thus excluding an ex ante selection of paradigms.

Applied to the more general problems of economic development, the neo-Schumpeterian perspective was introduced with reference to the concept of the techno-economic paradigm, defined as an ideal type of productive organisation that would represent the direction along which productivity growth could occur within and across firms, industries and countries. These paradigms constitute a framework for the articulation of entrepreneurship, as they channel and shape the entrepreneurial introduction of innovation and related coordination efforts. It was suggested that Schumpeterian entrepreneurship would deal with the introduction of novel production possibilities that constitute a new techno-economic paradigm. Kirznerian entrepreneurship would deal with the exploration and discovery of production possibilities within the range of an established techno-economic paradigm, thus contributing to the structural stabilisation and exhaustion of the economic potential of a techno-economic paradigm. This could involve a modification of innovations, yet without adding paradigmatic qualities.

Furthermore, it was argued that uncertainty was prevalent during paradigm change in most domains of the economic process, induced by Schumpeterian entrepreneurship in the creative destruction of firms and industries. While the new techno-economic paradigm diffuses, the mismatch of technologies and institutions imposes a restructuring process on the economy, including an adaptation of institutions to those patterns which are already established in the pioneering lead sectors. Indeed, this reflects a Schumpeterian exercise of paradigmatic leadership in the establishment of new routines and cognitive frameworks. The implementation of these paradigmatic institutional frameworks could reduce uncertainty, promoting a temporary stabilisation of the economic process. However, the institutional and structural adaptations that would follow the pioneering efforts in paradigmatic leadership were associated with discovery processes of the Kirznerian type. They denote coordination efforts which depend on the ordered devices of an established paradigm.

These problems of entrepreneurship and knowledge were subsequently applied to a critique of neoclassical approaches in the theory of economic growth which model technological innovation as an endogenous factor in the economic process, commonly represented by R&D activities in a specific knowledge sector, as formulated in Romer's model of endogenous technological change. It was claimed that these types of models would misrepresent the role of entrepreneurship, knowledge and learning. In general, neoclassical schemes of aggregate production functions and optimising representative agents seem to ignore the impact of uncertainty and paradigmatic qualities on innovation processes. Therefore, it was suggested that a reconsideration of institutional aspects would supplement most convincingly these ongoing explorations in the

microfoundations of economic growth and development. The exposition proceeded with an investigation of the institutional aspects of innovation, then focussing on the matter of institutional networks. This should underline the argument that firms are the decisive institutional terrain of innovation, interacting with other organisations from the private and public sectors, hence operating in markets, hierarchies and networks. Correspondingly, the spatial aspects of industrial evolution were associated with the impact of externalities, involving common knowledge pools and local industrial cultures.

Subsequently, the impact of these positions on Schumpeterian entrepreneurship was discussed, addressing various modes of interaction among economic agents as expressions of a collective type of entrepreneurship, stimulated by incentives for communication and cooperation. In order to grasp these interactions among diverse agents and organisations concerned with technological innovation, neo-Schumpeterian positions define the related institutional networks in the private and public sector as systems of innovation. Domains of interaction contain R&D and education, as well as legal frameworks and government policies, shaped by industrial structures and cultural patterns. These are predominantly relevant on the level of national systems of innovation, yet exhibiting segmented institutional layers of regional and local ensembles.

Accounting for the Schumpeterian perspective, then, the systems of innovation approach was used as a point of entry for further explorations into the process of economic development, with a focus on the catch-up growth of developing economies. In the history of economic thought, related concerns had been pointed out by Friedrich List, whereas structural tensions between technology and institutions in late industrialisation were particularly highlighted by Veblen and Trotsky, formulating ideas that influenced development economics in the shape of Gerschenkron's thesis that latecomer industrialisation would differ from the development of advanced economies in terms of the speed and structure of industrial transformation, as conditioned by institutional components. This could even constitute an advantage, due to a potential for technological leapfrogging. However, Gerschenkron's argument seemed to underestimate the role of continuous technological learning as well as the problems of technology assimilation, ignoring tacit components as well as the required investment in building absorptive capacities. It was concluded that technology assimilation would represent a domain of entrepreneurial efforts in innovation and coordination. Differing capabilities in proceeding with these efforts then contribute to the diversity of technology profiles among firms, industries, regions and nations, underlying the specificity of growth and development patterns.

The corresponding relationships among economic agents were said to be embedded in institutional networks. This argument was used to reformulate the Schumpeterian perspective on entrepreneurship, focussing on the embeddedness of entrepreneurial agents in social relations and institutional configurations that mirror the historical characteristics of pre-capitalist economic systems. This persistence of historical influences in the variety of institutional forms would not constitute a hindrance for capitalist development. Rather, it was said to contribute to its inherent dynamism. Accordingly, invoking Spiethoff's contributions to the theory of economic style that had been promoted in the context of the Historical School, it was argued that capitalist market economies should be approached in terms of varying national and regional economic styles. Four dimensions for reconstructing these styles were distinguished: an economic dimension comprising of elements like the pattern of development and the shape of industrial structures; a technological dimension pointing to patterns of

innovation; an institutional dimension dealing with technological capabilities and property rights; and a political dimension accentuating the role of the state in diverse modes of governance.

In particular, the historically rooted institutional forms that characterise national or regional economic styles mould the network contours of the corresponding innovation systems, promoting modes of interaction that shape the articulation of entrepreneurial capabilities. Although cognitive proximity and trust could promote coordination efforts in the context of an already established paradigm, facilitating continuous flows of knowledge, still persisting differences in the subjective assessment of profit opportunities and productivity potentials, based on diverse expectations and search strategies, remain a principal condition of entrepreneurial activity. Consequently, it was asked, which institutional configurations would enable economic agents to carry out the functions of entrepreneurship, embedded in the networks of an innovation system that reflects a distinct economic style. This pointed to the matter of Schumpeterian development functions, which included the entrepreneurial function of introducing novelty and enforcing change; the capitalist function of credit creation and risk-taking; and the inventive function of providing codified knowledge. Accordingly, the notion of embedded entrepreneurship should denote the institutional embeddedness of entrepreneurial agents in carrying out their functions of innovation and coordination, interacting with the carriers of the development functions of invention and finance. The carriers of these development functions operate on specific markets, facing an institutional framework that shapes their interactions by determining the level of transaction costs, and thus the modes of cooperation and learning, as well as the resulting innovation performance.

In the concluding sections of the exposition, implications for innovations policies were discussed. In particular, functions of an entrepreneurial state were taken to the fore by distinguishing two modes of carrying out the entrepreneurial function, thus reiterating Schumpeterian arguments. First order entrepreneurship should denote the initiation of new paradigms, either in terms of the generation of new technologies or in terms of the assimilation of existing technologies that are put to use in a new context. This would include paradigmatic leadership in technological and institutional agenda setting, based on extensive interaction with agents from the private sector who communicate the impact of market competition. Second order entrepreneurship should deal with institutional frameworks and physical infrastructures that shape the economic process. This would include the institutional support of continuous knowledge flows among the economic agents, contributing to the coordination of their interactions. Policies for the support of entrepreneurship need to take notice of these settings, accounting for the stimulation of entrepreneurial activities, while reconsidering the underlying economic functions and the variety of agents who carry them out.

This argument was illustrated by the case of the East Asian newly industrialising economies, where entrepreneurship is represented by a broad array of institutional forms, reflecting its embeddedness in the patterns of specific economic styles. Entrepreneurial contributions to the East Asian development performance have included the coordination aspects of market making and network building, as well as the innovation aspects of technological restructuring. In this context, it was argued that innovation policies in East Asia could be perceived as the manifestation of an entrepreneurial state which promotes developmental visions and industrial strategies, based on close relationships between the public and the private sector. Thus it was concluded that recognising the interdependence of the technological and institutional

dimensions of economic development would remain indispensable for the design and implementation of reflexive innovation policies.

With respect to the current analytical status of Schumpeter's original contributions in the theory of economic development, however, this concluding assessment may address some critical points at first. These would include the problems of elitism in Schumpeter's early accounts of entrepreneurship, accompanied by an underestimation of invention as a specific functional domain in the development process, especially with regard to the demand side of the economic process. This would also point to shortcomings in the representation of knowledge in market coordination. Furthermore, the function ascribed to the financial sector in assessing and selecting innovative ventures could be criticised for overstating its role as a domain of economic rationality. In the context of the preceding exposition, however, the decisive area of criticism may be associated with economic development as a historical process, representing a principal concern of Schumpeter's vision.

Indeed, Schumpeter's analyses of entrepreneurship and innovation dealt mainly with the competitive and trustified phases of capitalist development, to use Schumpeter's terms, predicting a socialist transformation that was largely inspired by experiences with the rationalisation of the economic process. However, quite to the contrary, a regained flexibility of institutional and structural patterns has historically coined the economic performance of developed capitalist economies, paralleled by an irreversible decline of the socialist systems of administrative planning. In particular, regional economies with their networks of small enterprises, accompanying the internationalisation of economic processes which is driven by the production networks of multinational enterprises, have contributed to that process. Still, the Schumpeterian theme of progressing rationalisation may be traced even in this setting, for globalisation could be interpreted as a persisting challenge for the historically rooted institutional coherence of regional economies. These recent developments reflect a change of the dominant techno-economic paradigm while heralding yet another phase in the evolution of modern capitalism, perceived as a knowledge-based economy that is associated with the global diffusion of information and communication technologies. In this kind of network capitalism, then, the formation of information infrastructures would parallel Schumpeter's original concern with railroadisation as a historical standard case of innovation, involving the outstanding role of entrepreneurship in the private and public domains.

In commenting on Schumpeter's scepticism regarding the survival of capitalism, Heilbroner has declared hat Schumpeter remained the "worldly philosopher of mature capitalism", failing to recognise that "the most distant reach of his thought was not a terminus but a horizon" (Heilbroner 1981: 471). Yet it needs to be stated that the evolution of Schumpeter's thought on entrepreneurship and economic development was also characterised by a relaxation of rigid positions, allowing for a reflection of comprehensive historical and empirical material that was in agreement with historist propositions. Still, it seems that Schumpeter, who never questioned the capacity for an economic survival of capitalism, underestimated its reproductive capacities on an institutional level, upholding a variety of institutional forms as an embedding setting for the carrying out of entrepreneurship. Paradoxically, then, Schumpeter's prophecy of capitalist decline contained those arguments that could be used for explaining its continued existence. This impact of the institutional dimension needs to be assessed as indispensable in the perception of a "Schumpeterian Age" that has been proclaimed as an expression of the revitalised interest in the developmental principles of capitalist market economies. Indeed, it signals the persisting analytical value of the Schumpeterian perspective.

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