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### **The Unintended Consequences of the Debt --- Will Increased Government Expenditure Hurt the Economy?**

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## The Unintended Consequences of the Debt - - - Will Increased Government Expenditure Hurt the Economy?

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### **Abstract:**

In 2008, governments in many countries embarked on large fiscal expenditure programmes, with the intention to support the economy and prevent a more serious recession. In this study, the overall impact of a substantial increase in fiscal expenditure is considered by providing a novel analysis of the most relevant recent experience in similar circumstances, namely that of Japan in the 1990s. Then a weak economy with risk-averse banks seemed to require some of the largest peacetime fiscal stimulation programmes on record, albeit with disappointing results. The explanations provided by the literature and their unsatisfactory empirical record are reviewed. An alternative explanation, derived from early Keynesian models on the ineffectiveness of fiscal policy is presented in the form of a modified Fisher-equation, which incorporates the recent findings in the credit view literature. The model postulates complete quantity crowding out. It is subjected to empirical tests, which were supportive. Thus evidence is found that fiscal policy, if not supported by suitable monetary policy, is likely to crowd out private sector demand, even in an environment of falling or near-zero interest rates. As a policy conclusion it is pointed out that by changing the funding strategy, complete crowding out can be avoided and a positive net effect produced. The proposed framework creates common ground between proponents of Keynesian views (as held, among others, by Blinder and Solow), monetarist views (as held in particular by Milton Friedman) and those of leading contemporary macroeconomists (such as Mankiw).

**JEL Classification:** E51, E62, H30, H60, O42

**Keywords:** Credit, Crowding Out, Equation of Exchange, Fiscal Policy, Japan, Monetarism, Monetary Policy, Quantity Equation

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“The increase in government purchases must be met by an equal decrease in [private] investment...” Mankiw (1994:62)

“Before Keynes, it was commonplace that government spending and taxation were powerless to affect the aggregate levels of spending and employment in the economy; they could only redirect resources from the private to the public sector. ... The Keynesian demonstration ... changed all this. Economists began to stress the macroeconomic effects of government spending and taxation. It became commonplace that not only would a dollar of additional government spending raise national income by the original dollar but that this expenditure would have multiplier effects of perhaps several dollars more. The old view that government spending simply crowded out private spending was banished.”

Blinder and Solow (1973:319).

## **1. Introduction: Why consider Japanese Fiscal Policy in the 1990s?**

In 2008, governments in many countries embarked on some of the largest fiscal expenditure programmes witnessed in many decades. The rationale is that fiscal expenditure is necessary to support the economy and prevent a serious recession or depression. Fiscal expenditure will be used to purchase equity in banks, purchase non-performing assets, compensate depositor losses and to engage in active government investment and spending programmes to stimulate demand.

It is the purpose of this paper to throw light on these measures and in particular potential unintended consequences of the substantial increase in fiscal expenditure. The most relevant recent experience in similar circumstances is that of Japan in the 1990s: having fuelled a speculative bubble in the 1980s, the banking system became virtually insolvent during the 1990s and stopped lending, while asset prices collapsed. Already from 1992 onwards the government thus set out on a multi-year fiscal stimulation programme, which amounted to one of the largest fiscal stimulation programmes in peacetime. To be sure, the programme started out more modestly, but when the desired effects could not be achieved, it was gradually expanded.

Government policy documents described the rationale of the programme: fiscal spending needed to be increased, in order to boost domestic demand and stimulate the economy.<sup>2</sup>

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<sup>2</sup> See the official statements at the announcement of stimulation packages. For instance: ‘Keikyuu keizai taisaku (youshi), 16 November 1999, Economic Planning Agency (available at: [www5.cao.go.jp/98/b/19981116b-taisakuyousi.html](http://www5.cao.go.jp/98/b/19981116b-taisakuyousi.html)).

The first fiscal stimulation package was implemented in 1992. This was followed by a number of additional packages in every year, except 1996 and 2000. Table 1 lists the packages and supplementary budgets. As can be seen, ten fiscal stimulation packages amounted to Y146trn. Eighteen supplementary budgets were passed, amounting to Y38.1trn over a decade that often also saw a significant expansion in the regular budgets.

**Table 1.** Fiscal stimulation packages and supplementary budgets in the 1990s

FY		91	92	93	94	95	96	97	98	99	00	Total
Fiscal stimulation packages	No.	0	1	2	1	2	0	2	1	1	0	10
	Size (Ytrn)	0	10.7	19.2	15.3	21.2	0	40.6	24.5	14.9	0	146.4
supplm. budgets	No.	1	1	3	2	3	1	3	2	1	1	18
	Size (trn)	0.3	-0.7	5.1	0.4	7.1	1.1	10.3	7.2	4.8	2.7	38.1

Sources: Cabinet Office, Ministry of Finance.

Since the government may have had political motives to overstate fiscal stimulation packages through double-counting, a more accurate measure of the fiscal stance may be total government expenditures, as calculated by the national income accounts (aggregating government consumption and investment, as well as inventory data). Government spending increased from a total of Y705 trn in the 1980s to Y1,136 trn in the 1990s. As a percentage of nominal GDP, this represented an increase from 20.9% on average in the 1980s to 22.7% in the 1990s. On a growth basis the more positive fiscal stance during the 1990s becomes more obvious: Table 2 shows the breakdown by contribution to growth of each GDP component. On average, government spending contributed almost half of growth in the 1990s, while it only contributed a sixth of growth in the 1980s.

**Table 2.** Contribution to nominal GDP growth in the 1990s

CY %	Consumption + Housing	Capex (+Inventories)	Net Exports	Private Demand	Government Consumption	Government Investment (+Inventories)	Total Government	Nominal GDP
1991	2.6	1.6	1.3	4.9	0.8	0.4	1.2	6.2
1992	2.0	-1.6	0.8	0.8	0.8	1.2	2.0	2.6
1993	1.7	-2.1	0.1	-0.6	0.7	1.2	1.8	1.0
1994	2.1	-1.4	-0.2	0.4	0.5	0.2	0.7	1.1
1995	0.3	0.8	-0.4	0.5	0.7	0.0	0.7	1.2
1996	2.0	0.5	-0.3	1.6	0.5	0.5	1.0	2.6
1997	0.2	1.9	1.4	2.6	0.4	-0.7	-0.4	2.2
1998	-0.7	-1.1	1.2	-1.1	0.3	-0.3	0.0	-1.2
1999	0.4	-1.3	-0.2	-1.4	0.4	0.2	0.6	-0.8
2000	-0.2	1.1	-0.1	0.7	0.6	-0.8	-0.3	0.3
1990s ave.	1.0	-0.1	0.4	0.8	0.6	0.2	0.7	1.5
1980s ave.	3.4	1.5	0.3	5.2	0.8	0.2	1.0	6.2

Source: Cabinet Office, December 2001

While the government contribution to growth increased in the 1990s, government revenues fell significantly, as the weaker economy reduced tax revenues.<sup>3</sup> Consequently, Japan's government registered the largest budget deficits of any industrial country in the postwar era, averaging over 6% of gross domestic product (GDP) during the period 1993-2000.

Textbooks tell us that there are two options to fund the revenue shortfall: debt-finance or money finance. In the former case, the government borrows from the private sector; in the latter, it either creates money directly, or borrows from the central bank, which pays by creating money.<sup>4</sup> In Japan's case the issuance of legal tender has been delegated to the Bank of Japan, which, since at least the late 1970s, has in practice acted largely independently from the government. Moreover, the Finance Law does not allow the central bank to directly underwrite government bonds.<sup>5</sup> This has apparently left the

<sup>3</sup> There were important tax reductions in 1994 and 1998. However, at other times, fiscal policy tightened. Hoshi and Patrick (2000) estimate that the 1997 ending of income tax rebates and the rise of the consumption tax from 3% to 5% increased government revenues by about two percentage points of GDP.

<sup>4</sup> Dornbusch and Fischer (1987) emphasise that “the distinction between selling debt to the public and selling it to the central bank is essential. The distinction between money and debt financing can be further clarified by noting that Treasury sales of securities to the central bank are referred to as *monetizing the debt*, meaning that the central bank creates (high-powered) money to finance the debt purchases” (p. 584).

<sup>5</sup> The central bank can purchase government bonds in the secondary market one year after issuance. Economically, this is equivalent to primary market purchase. The political circumstances are different, since the government may not be able to determine the extent to which bonds are purchased by the central bank. Despite legal lack of independence, since the 1970s the central bank has independently made this decision. See our discussion of monetary policy below.

government no choice but to fund the public sector borrowing requirement from the private sector, mainly via bond and bill issuance (Table 3).<sup>6</sup>

**Table 3.** Government Borrowing and Debt in the 1990s

Source: Bank of Japan

New CY ¥trn	New borrowing	New borrowing/ nGDP	Total Outstanding debt	Total Outstanding debt/ nGDP
<b>1991</b>	4.65	1.0%	226.35	47.7%
<b>1992</b>	14.71	3.0%	241.06	49.9%
<b>1993</b>	17.33	3.6%	258.38	53.0%
<b>1994</b>	27.15	5.5%	285.53	58.0%
<b>1995</b>	27.21	5.4%	312.74	62.3%
<b>1996</b>	30.94	6.0%	343.68	66.7%
<b>1997</b>	24.92	4.8%	368.60	70.9%
<b>1998</b>	58.38	11.4%	426.98	83.2%
<b>1999</b>	50.79	9.9%	477.76	92.9%
<b>2000</b>	44.34	8.6%	522.10	101.8%
<b>Total</b>	<b>300.4</b>	<b>6.0%</b>		

government borrowing increased by Y300.4 trn during the 1990s (58.6% of 2000 nominal GDP). This raised total outstanding debt to Y522.1trn by the end of 2000, amounting to 101.8% of GDP. Adding the new borrowing of Y60.36trn during 2001, the national debt figures recorded a new high of Y 582.46trn, about 120% of GDP, by the end of 2001. The debt continued to rise during subsequent years. With Japan's economy never fully recovering and growth remaining below potential for what will soon amount to twenty years, Japan has ever since been heading towards a debt/GDP ratio of 200%.<sup>7</sup>

<sup>6</sup> Indeed, the government's borrowing is another measure of the stance of fiscal policy.

<sup>7</sup> Bloomberg reported on 31 March 2009 on the OECD's forecasts for 2010: "Japan's public debt is likely to surge to 197.3 percent of gross domestic product next year, limiting the government's ability to spend more to revive growth, the Organization for Economic Cooperation and Development said. "With the debt ratio projected to approach 200 percent in 2010, the scope for additional fiscal stimulus is limited," the Paris-based organization said in a report today. "It will be important to focus again on fiscal consolidation as the economy stabilizes." (Nonomiya, 2009).

## 2. The Literature on the Effectiveness of Fiscal Policy in the 1990s

### (a) ‘Fiscal Policy was Effective’

The question whether fiscal policy has been effective in stimulating Japan’s economy has triggered a lively debate. Since many economists in Japan would call themselves Keynesian, fiscal spending has many supporters.<sup>8</sup> The need for and usefulness of fiscal stimulation has, among others, been argued by Nagatani (1996), Yoshitomi (1996), Koo (1995, 1999), Posen (1998), Ito (2000) and Kuttner and Posen (2002).

#### *The Keynesian View*

The special case for fiscal policy effectiveness was made by Ito (2000), when short-term nominal interest rates had started approaching zero. He argued at the time that the economy was in a liquidity trap, the demand for money perfectly interest-elastic and the LM curve horizontal. Since interest reductions had not stimulated investment, he argued that investment was perfectly interest-inelastic and the IS curve vertical. Thus monetary policy would be ineffective and fiscal policy unusually effective, without any crowding out. Hence Ito advocated further fiscal stimulation as being effective in such a zero interest environment.<sup>9</sup>

There is a theoretical problem with this argument, as well as an empirical one. By arguing for a horizontal LM curve, describing the case of short-term nominal interest rates that have fallen to such low levels that they do not fall further, Ito restricts his argument to time periods that exclude the entire decade of the 1990s – during this decade interest rates did indeed fall steadily.

An empirical evaluation of the effectiveness of fiscal policy also depends on the size of the expected impact of fiscal expenditures. While the Keynesian model implies a ‘multiplier’, such that Y1trn of fiscal expenditures would result in a rise in economic activity larger than Y1trn, many proponents of fiscal policy effectiveness have adopted a far more cautious approach to fiscal policy effectiveness. Downplaying second and third-round effects entirely, most proponents emphasized the role of the primary impact: To estimate the expected impact of fiscal policy, many government and private sector economists therefore often argued that a public works project worth Y1trn would boost nominal GDP by Y1trn. A spending package amounting to 2% of GDP was commonly expected to boost

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<sup>8</sup> The ineffectiveness of fiscal stimulation has probably rendered many supporters of fiscal spending less vocal by the late 1990s.

<sup>9</sup> “So far, a straight Keynesian prescription applies” (Ito, 2000, p. 102).

GDP by 2 percentage points.<sup>10</sup>

Concerning the empirical evidence, Posen (1998) and Kuttner and Posen (2002) argue that fiscal policy has been effective in Japan during the 1990s. In his view, actual fiscal spending has been smaller than the headline figures for the packages. The authors argue that fiscal spending has not been sufficiently large to stimulate the economy. A suitably sized fiscal expansion would, in this view, have been effective in ending economic stagnation and deflation. According to Posen (1998), when the actual spending reached substantial size in 1995, a recovery followed (in 1996).<sup>11</sup> In other periods, there was no sizeable fiscal stimulation, according to him. However, actual GDP-based expenditure data or statistics for the government borrowing requirement yield reasonably accurate measures of the fiscal stance. Using such figures, as cited above, we find that sizeable fiscal stimulation did take place and that it failed to stimulate the economy.

Ito (2000) also remains convinced of the effectiveness of fiscal policy. While he concedes that the unprecedented six fiscal stimulation packages that were implemented between 1992 and 1994 have had “little impact” (p. 102), he argues that this does not prove fiscal policy ineffectiveness, as defined by him. In principle, two definitions of effectiveness are possible. One is a *mutatis mutandis* requirement for effectiveness, defining it as the ability to create significant positive economic growth. This is the strictest definition, and the one that matters to policy-makers, investors and the population at large. In the first half of the 1990s, most private sector economists, forced to make *mutatis mutandis* forecasts, predicted significant economic recoveries, mainly based on the sizeable fiscal stimulation. However, this did not happen. Thus, by their original definition, fiscal policy was ineffective.

There is another definition of policy effectiveness, which is employed by Ito (2000). It is based on the *ceteris paribus* assumption:

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<sup>10</sup> This was the most common calculation, used by Japanese private sector research institutions, as well as key government agencies. See, for instance, the Economic Planning Agency’s Nagatani (1996), who argued in favour of fiscal stimulation, because “Even when the ripple-on effect is zero, fiscal stimulation policy will still at least have the ‘direct effect’, which is that Y1 trn of increase in public investment will result in a Y 1 trn in GDP increase”.

<sup>11</sup> Posen follows a calculation common in financial markets in Tokyo, namely to distinguish between investment that “adds to demand” – so-called *mamizu* – and that which does not. The *mamizu* is defined as including increased public spending and tax cuts. Loan programmes offered by government-affiliated institutions to the private sector and funded by postal savings deposits investment is deemed not to add to demand, but merely reallocating funding among various projects. The important insight from this distinction is the necessity to distinguish between government spending that increases net purchasing power in the economy, and government spending that merely reallocates existing purchasing power. However, the way this is attempted by the *mamizu* calculation is flawed. A meaningful distinction must focus on the credit creation process and include the central bank and the banking system, rendering true *mamizu* the monetized part of fiscal policy (see below).

“Without any fiscal stimulus, the economy undoubtedly would have contracted. The underlying economy was so weak that fiscal stimulus did not bring the economy all the way to its potential growth rate but it arguably kept things from becoming worse” (p. 102).

Supporters of the efficacy of fiscal spending, including Posen (1998), feel that even more fiscal stimulation is the solution for Japan.<sup>12</sup> The difficulty of establishing clear-cut proof is apparent: the *ceteris paribus* condition is invoked, only to claim its violation. The argument relies on counter-factual analysis: things would have been worse without the fiscal spending. Ito indeed relies on unspecified shocks, rendering economic growth exogenous to fiscal and monetary policy.<sup>13</sup> These undefined exogenous shocks cannot be isolated or quantified. What is worse, by invoking a violated *ceteris paribus* assumption, the fiscal policy effectiveness claim cannot be falsified – it leaves the realm testable hypotheses.<sup>14</sup> Ito’s claim appears to be an attempt at reconciling inconvenient facts with a theory through the use of ad hoc assumptions about exogenous shocks. Even leaving aside whether or not these assumptions are permissible, such an exercise cannot be construed as constituting supportive empirical evidence.

Thus the only empirical study offering empirical evidence supporting the argument that fiscal policy has been effective is Kuttner and Posen (2002). However, their findings stand in sharp contrast to other empirical work, and they suffer from a number of methodological problems. Most importantly, their model does not include a monetary variable, as their VAR identifying assumption is that monetary policy does not affect the economy contemporaneously (while fiscal policy does). Since they use annual data, this appears to be a problematic assumption, also in the light of the empirical evidence presented below. Their empirical estimates are not tested for robustness or encompassing when tested in direct comparison with alternative models

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<sup>12</sup> Ito follows Posen’s (1998) recommendations and suggests further stimulation in the form of lasting income tax cuts and tax incentives to stimulate private housing investment. Ito (2000), pp. 103ff.

<sup>13</sup> Ito recognizes this, but leaves the questions raised unanswered. “The question remains as to what prevented the economy from getting back on a self-sustained growth path. Was it the series of bad shocks? Or has the dynamic spill-over effect of fiscal packages become smaller in the 1990s? Or was the amount of actual stimulus smaller than generally recognized?” (Ito, 2000, p. 102). No attempts at answers follow.

<sup>14</sup> This line of reasoning falls far short of Popper’s methodological principles. It may well be in the tradition of deductivist economics, which takes little interest in empirical evidence and concludes from any gap between theory and reality that the latter needs changing, not the former. However, it defies common sense. Nevertheless, even in the absence of omniscience concerning exogenous shocks, it is possible to test hypotheses concerning the *cause* of potential fiscal policy ineffectiveness (see below).

## (b) ‘Fiscal Policy was Ineffective’

The majority of researchers take the view that fiscal policy has disappointed. Empirical studies by Bayoumi (2001), Dalsgaard, André and Richardson (2001) and Perri (1999) found that fiscal policy had only very small positive effects. IMF (1998), as well as Ramaswamy and Rendu (2000) even found that public consumption had a negative impact on economic activity in the 1990s.

Several arguments have been proposed over the years why fiscal policy may be ineffective. In the case of the Japanese economy, three types of arguments were made. All three point out that the simple first-round positive effects of fiscal policy may be partially or completely negated by negative effects that result from the need of the government to procure the money in order to fund the fiscal expenditure. The first is based on a Keynesian relationship between interest rates and investment and argues that crowding out of fiscal expenditure may occur via higher interest rates. The second is based on a reduction in consumption and an increase in savings that is induced by increased fiscal spending. It is commonly referred to as ‘Ricardian equivalence’. The third is based on a modified credit view and emphasizes the link – or lack thereof – of fiscal and monetary policy. The first two views will be reviewed briefly below, before the third is analysed, applied and tested in greater detail.

### *Interest Rate-Based Crowding Out*

During the 1960s, with the rise of the Keynesian paradigm, fiscal policy had been given prominence in policy-making in the US and many European countries. This was justified with the Keynesian government expenditure multiplier analysis. However, in the late 1960s and until the end of the 1970s, a growing body of literature pointed out that such analysis was misguided, as it focused only on the initial-stage multiplier effect. An analysis of the complete multiplier would have to include the question of how the budget deficit is financed, and incorporate the effects of such finance. Christ (1968), Blinder and Solow (1973), Hansen (1973) and others showed that for bond-financed deficit spending, the stimulative effect of fiscal policy is smaller than that derived in traditional Keynesian models that do not take funding into consideration.<sup>15</sup> The crowding out effect of increased government expenditure via higher interest rates is reflected in standard Keynesian models and the IS-LM synthesis, but also the mainstream monetarist models (such as Friedman, 1956, Brunner and Meltzer, 1976).<sup>16</sup> While they differ in the size of the net effect of fiscal

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<sup>15</sup> Their work was preceded by Lerner (1943) who rejected debt-financed deficits entirely.

<sup>16</sup> While proto-monetarist formulations did not rely on interest rates, but the equation of exchange, as outlined below, and

policy, they agree that the transmission mechanism (and potential crowding out) occurs via interest rates. Indeed, the substantial literature on the possibility and size of crowding out of debt-financed fiscal expenditure has in common that it centers on interest rates as the adjustment mechanism.<sup>17</sup> What all these formulations (classical, neo-classical Keynesian and post-Keynesian) have in common is that the ineffectiveness of fiscal policy is the result of increased interest rates.

In the case of Japan it was indeed argued by some economists during the first half of the 1990s that increased bond issuance to fund fiscal spending would lower bond prices and push up long-term interest rates. This rise of interest rates would negatively affect investment and economic activity, it was said. A proponent of this interest rate-based crowding out argument is, for instance, Yoshida (1996), who additionally warned that the long-term interest rate rises would tend to strengthen the yen and hurt net exports.

The main problem with these interest-rate based arguments for fiscal policy ineffectiveness is that there is no empirical evidence in their support.<sup>18</sup> Despite brief periods of rising long-term nominal rates, nominal short-term (as measured by call rates) and long-term interest rates (as measured by ten-year government bond yields) have trended down during the 1990s. There are only two instances where they rose: from 4.3% on average in 1993, to 4.4% in 1994, and from 1.3% in 1998 to 1.8% in 1999. However, in both cases rates subsequently resumed their decline to new lows (see Figure 1).<sup>19</sup>

Calculating real interest rates as the difference between these nominal interest rates and consumer price inflation (as measured by the CPI), we find that short-term real interest rates fell from 4.2% on average in 1991 to 0.11% on average in 2000, while long-term real interest rates fell from 3.0% on average in 1991 to 0.7% in 1998, though rising again to 2.5% on average in 2000. These real rates were lower than during the 1980s. These facts contradict interest rate crowding out arguments.

early monetarists (wisely?) said little about the precise transmission mechanism between money and the economy, later monetarist models (such as Friedman, 1956, Brunner and Meltzer, 1976) accepted the Keynesian interest-elasticity of the demand for money and thus argued that the ineffectiveness of fiscal policy relies on perverse wealth effects associated with bond-financed government spending, operating via interest rates (see Blinder and Solow, 1973). Since interest rates failed to rise during the 1990s, such later monetarist models are not suitable to explain the Japanese experience and will not be discussed further.

<sup>17</sup> See Christ (1968), B. Friedman (1978), Blinder and Solow (1973), Ludvigson (1996). Those who argued that ‘portfolio crowding in’ may offset ‘transactions crowding out’ and thus produce either a positive or ambiguous effect of debt-funded fiscal stimulation (such as B. Friedman, 1978) do not contribute towards finding an answer to the phenomenon observed in Japan during the 1990s, namely no significant rises in interest rates, but also no significant effect of fiscal stimulation.

<sup>18</sup> Examples of empirical studies of the link between fiscal policy and interest rates in the US are Hutchison and Pyle (1984) and Hoelscher (1986). For examples and reviews of empirical work on the influence of fiscal policy on aggregate demand, see, for instance, Aschauer (1985) and Tatom (1985).

<sup>19</sup> The annual average of the prime lending rate has declined every single year during the 1990s.

Invoking a violated *ceteris paribus* definition of crowding out, the theoretical argument might be conceivable that the fall interest rates happened *despite* the crowding out, and as a result of exogenous shocks, without which interest rates would have risen. Just as with the argument that fiscal policy was effective in Japan during the 1990s, as without it things would probably have been worse, proponents of this view are faced with the difficulty of having to isolate the exogenous shocks needed to justify the absence of interest rate rises.<sup>20</sup> Furthermore, this exercise in attempting to reconcile the contradictory empirical record with the theory through the use of auxiliary assumptions cannot be construed as constituting supportive empirical evidence. Thus the fact remains that the argument of interest rate based crowding out is not supported by the empirical record. Given the historical and dramatic declines in short, long, nominal and real interest rates, it can be safely said that few, if any observers seriously entertain the interest rate crowding out argument.<sup>21</sup>

### *Ricardian Equivalence*

Another case for a different kind of crowding out has been made by Krugman (1998). Applying his model of inter-temporally optimizing rational representative agents to Japan, he obtains Ricardian equivalence of the type Barro (1974) proposed: Japanese consumers believe that any fiscal spending funded by the issuance of government debt (as most of it has been) will require the debt to be fully paid off in the relevant future by raising taxes on individuals. Then for every yen in government spending, rational consumers would increase savings by one yen - preparing the money to repay the government in the future.

One analytical problem with this model is that it does not allow for the possibility that the debt will be paid off by other means - such as money creation, higher corporate taxes, economic growth that boosts tax revenues without raising individual taxes, or asset sales to foreign investors. It is not clear why rational consumers would not consider these possibilities, especially in a deflationary economy operating below the full employment

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<sup>20</sup> McKibbin (1996) engages in this difficult exercise, making use of a multi-country structural model to endogenise shocks to the Japanese economy. Pointing out the anticipated nature of the fiscal spending packages (and their partial overstatement), he concludes: "Rather than stimulating the economy, these fiscal measures acted to further slow economic activity as well as appreciate the real exchange rate" (p. 37). In McKibbin's model, the announcement effect of fiscal stimulation occurs immediately, appreciating the exchange rate and real long-term interest rates, while the positive effect occurs later, or to a lesser extent than announced (due to overstatement of the package). However, only data through 1995 is used, thus missing much of the 400 basis point drop in long-term interest rates over three-and-a-half years, from about 4.7% in February 1995 to 0.7% in October 1998, not to mention the further drop to 0.43 by June 2003.

<sup>21</sup> Walker (2002:286), for instance, says: "The possibility of a crowding-out effect of government spending on investment is dismissed *ex ante*, given Japan's low real interest rates in recent years".

level.<sup>22</sup>

Another problem is that the assumptions on which this argument is based are restrictive. Thus if there is a simpler explanation (as will be presented below), the fundamental principles of logic suggest that it would be preferable. Meanwhile, the empirical record of the Ricardian equivalence argument remains important to assess its relevance. The most basic test of Ricardian equivalence would be a comparison of the change of household savings and government expenditure or borrowing within a fully specified savings function. Proponents of this explanation of fiscal policy ineffectiveness have not provided such evidence, as far as the author is aware.<sup>23</sup> Indeed, Walker (2002: 286) holds that “It seems unlikely that anything as austere as full Ricardian equivalence would obtain in the real world.”<sup>24</sup> We therefore proceed to the third possible explanation of why fiscal policy appears to have been ineffective in Japan during the 1990s.

### **3. An Alternative Explanation of Fiscal Policy Ineffectiveness**

#### **(a) Theory**

Standard theories of fiscal policy ineffectiveness have difficulties when applied to Japan during the 1990s. There is no support for the classical, neo-classical, IS-LM synthesis and

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<sup>22</sup> The argument that debt could be paid for by non-inflationary money creation cannot be handled by the type of models Krugman refers to, because due to further assumptions, including perfect information, they do not allow for the possibility of less than full employment output. With record-high unemployment and a ten-year recession in Japan, the relevance of such models is not obvious.

<sup>23</sup> If the fiscal stimulus takes the form of tax reductions for individuals and not increased government spending, then savings increase, while consumption remains unchanged - as the higher disposable income is not used for spending. If the fiscal stimulus takes the form of increased government spending on investment projects, incomes will not necessarily rise, thus consumption may not necessarily rise. But savings would rise. Since fiscal stimulation took the form of a combination of government spending and income tax changes (with the emphasis being clearly on government spending, though), the expected movement of consumption would be ambiguous with Barro-Ricardian equivalence. But the behaviour of savings would unambiguously have to be counter-directional to the movement of government borrowing.

<sup>24</sup> Walker (2002) also fails to test Ricardian equivalence directly. Instead, noting the low fiscal multipliers for Japan in the 1990s, he proposes a theory according to which the fiscal multiplier declines the larger the *level* of the budget deficit. He argues that government spending does exert a wealth effect on consumption, but one that is “proportionate to the amount of waste in the budget”. Without providing empirical evidence, Walker assumes that “the average quality of public spending decreases with the level of spending”. Walker finds a positive fiscal multiplier, contradicting Ricardian equivalence. Making a number of auxiliary assumptions, Walker defines as a large fiscal deficit one that amounts to more than 6 or 7% of output and finds that “there is a threshold beyond which the effectiveness of fiscal spending falls off sharply” (p. 298). There is no test for robustness of these findings over different time periods or in other countries. Further, Walker says nothing about the mechanism by which the effectiveness of fiscal spending is reduced. Walker really argues that since fiscal policy was ineffective in Japan in the 1990s, and since it was large, it must have been *too large to be effective*. Thus, the main question of concern, namely why steady and significant fiscal stimulation during the 1990s failed to trigger a significant and sustained economic recovery, remains unanswered: by arguing that fiscal policy was too large to be effective, Walker neglects to explain why fiscal policy, when it was not too large (and not too small), also failed to produce the desired results. Finally, Walker fails to address previous literature that discussed the issue of the absolute size of fiscal deficits and government debts. Most previous theories failed to attach much significance to the size of the fiscal deficit or national debt. One early example is Lerner’s (1943: 47) case that “the absolute size of the national debt does not matter at all”.

monetarist models which argue for crowding out of private demand due to debt-funded fiscal expenditure via a rise in interest rates. Similarly, there is no empirical support for the Ricardian equivalence hypothesis, which does not require a rise in interest rates and argues that consumers spontaneously reduce their spending and increase savings to match any increase in government expenditure.

In order to adequately explain the Japanese experience since the early 1990s, a theory is therefore required which allows for crowding out of fiscal expenditure, without the need for interest rates to rise, but also without relying on the empirically less plausible Ricardian equivalence argument (of perfectly foresighted savers replacing government expenditure with savings yen by yen).

This suggests that an older strand of literature, which in accordance with Blinder and Solow (1973) could be called “pre-Keynesian”, or alternatively “proto-monetary”, may be reconsidered. One feature of this older literature is that it focuses directly on the link between fiscal and monetary policy. Indeed, the debates about fiscal policy effectiveness have centered on bond-financed deficits. The possibility of money-financed fiscal expenditure appears to have been neglected.<sup>25</sup> While this may reflect the changed institutional environment of the past decade or so, where central banks have become independent, this does not eliminate the possibility of central bank cooperation with government policy or the need to analyse it. The neglect of the possibility of money-financed fiscal expenditure is all the more surprising as the literature had always agreed unanimously that fiscal policy, if funded this way, will be effective:

“There is no controversy over government spending financed by printing money. Both sides agree that it will be expansionary; but one group likes to call it fiscal policy, while the other prefers to call it monetary policy. Nothing much hinges on this distinction.” Blinder and Solow (1973: 323).

#### *Pre-Keynesian and Early Keynesian Views*

Irving Fisher’s (1911) model does not rely on the monetary transmission through interest rates. Instead, it relies on direct quantity-based crowding out of private demand, due to increased claims on limited stocks of money by the government. Later monetarist models adopted the Keynesian argument of an interest-based investment function and thus came to rely on interest-based crowding out of private demand. However, some of Friedman’s

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<sup>25</sup> Ludvigson (1996) seems representative in his neglect of this possibility.

writings indicate that he continued to sympathize with Fisher's quantity-based crowding out: "I regard the description of our position as "money is all that matters for changes in nominal income and for *short-run* changes in real income" as an exaggeration but one that gives the right flavor of our conclusions", he said as late as 1970 (Friedman, 1970: 217).

"On the transmission mechanism from money supply changes to income changes, Friedman supported Fisher's direct transmission mechanism – from money supply changes directly to expenditures changes – over the indirect one – from money supply to interest rates to investment – in Keynesian and IS-LM models", says Handa (2000: 365).<sup>26</sup>

This direct transmission of money to the economy, and consequent quantity-based crowding out of fiscal expenditure was also supported by the so-called 'St. Louis monetarists' (Handa, 2000: 370). They argue that government spending financed by bonds must be ineffective, because the money supply is left unaltered. Empirical evidence in support of this contention have been provided by Andersen and Jordan (1968), Andersen and Carlson (1970) and Keran (1969, 1970). This view was indeed "commonplace" before Keynes (see the introductory quote).

But even Keynes was aware of the importance of the way government expenditure is funded. Before Keynes developed the liquidity preference theory, he was more concerned with Fisher-type quantity equations (see Keynes, 1930). In 1929, he argued that stimulatory fiscal expenditure should be funded by monetary expansion (Klein, 1968). Crucially, Keynes emphasized (in 1929) that the central bank could negate the effect of stimulatory fiscal policy and therefore "ensure that the expenditure financed by the Treasury *was at the expense of other business enterprise*" (Keynes, 1932:126). A simple model emulating the 'pre-Keynesian' or 'proto-monetaryist' conception of the role of fiscal policy is presented below.

Following the income version of Fisher's quantity equation, this 'common view' held that nominal GDP (PY) is endogenous to the money supply (with velocity V being constant) and can be written as in equation (1), where we have followed the convention to place the endogenous variable on the left-hand side:

$$(1) \quad PY = MV$$

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<sup>26</sup> As a result, "Friedman stands out in arguing that fiscal policy does not have strong effects on the economy..." (Dornbusch and Fischer, 1987: 671). "Fisher comes close to asserting that *only* changes in the quantity of money affect the price level; Friedman is more clear in arguing that other factors can affect the price level, but that these other factors are of secondary importance" (Dornbusch and Fischer, 1987:241).

Considering changes (so that the constant velocity drops out), we can rewrite this to state that nominal GDP growth is equal to money supply growth (or proportional in weaker versions):

$$(2) \quad \Delta(PY) = V\Delta M$$

It follows that any exogenous increase in a component of nominal GDP (such as in G) cannot affect total nominal GDP, if the money supply remains unaltered: with  $\Delta M = 0$ , and breaking down nominal GDP (PY) into nominal consumption c, nominal government expenditure g, nominal investment i and nominal net exports nx, we obtain:

$$(3) \quad \Delta M = 0$$

$$(4) \quad \Delta(PY) = \Delta c + \Delta i + \Delta g + \Delta n x$$

$$(5) \quad \Delta g = -(\Delta c + \Delta i + \Delta n x)$$

Equation (5) indicates that, following Say's Law, each dollar of additional government spending must crowd out exactly one dollar of private spending. The change in government expenditure  $\Delta g$  is countered by a change in private sector expenditure of equal size and opposite sign. Thus the level of aggregate income will be unchanged and the multiplier for bond-financed government spending is zero. Notice that this conclusion is not dependent on the classical assumption of full employment. Instead of the employment constraint, the economy can be held back by a lack of money. Fiscal policy can thus crowd out private demand even in the context of less than full employment. Furthermore, the original formulation of Fisher, favoured also by Friedman, does not include interest rates and thus does not require crowding out via higher interest rates. Instead, the direct quantity effect of the government using up money that will not be available for spending by the private sector is sufficient. Equation (5) shows that without an increase in the money supply, a rise in government expenditure must result in an equal reduction in private demand, leaving nominal GDP unaltered and fiscal policy completely ineffective. As Milton Friedman put it:

“The quantity theory implies that the effect of government deficits or surpluses depends critically on how they are financed. If a deficit is financed by borrowing from the public without an increase in the quantity of money, the direct expansionary effect of the excess of government spending

over receipts will be offset to some extent, and possibly to a very great extent, by the indirect contractionary effect of the transfer of funds to the government through borrowing. ... If a deficit is financed by printing money, there will be no offset, and the enlarged stock of money will continue to exert an effect after the deficit is terminated. What matters most is the behavior of the stock of money, and government deficits are expansionary primarily if they serve as the means of increasing the stock of money; other means of increasing the stock of money will have closely similar effects.<sup>27</sup>

However, this explanation suffers from a significant empirical obstacle: it is well-documented that macroeconomic models based on the quantity equation and predicated on the assumption of constant velocity have suffered from “recurring bouts of instability” (Goldfeld and Sichel, 1990: 349): Significant declines in velocity (and hence a “breakdown” in the money demand function) have been observed in a large number of countries since the 1980s, including the UK, the US, Scandinavian countries, and Japan. The previously stable relationship between M and PY “increasingly came apart at the seams during the course of the 1980s” (Goodhart, 1989). As a result, the usefulness of the quantity equation has declined significantly. “Once viewed as a pillar of macro-economic models, it is now widely regarded as one of the weakest stones in the foundation” (Boughton, 1991). The instability of velocity and hence the lack of a stable relationship between monetary aggregates (such as M<sub>0</sub>, M<sub>1</sub>, M<sub>2</sub> or M<sub>3</sub>) and nominal GDP has also been recognized in the case of Japan (see, for instance, Ishida, 1984, Bank of Japan, 1988, Miyao, 1996, Yamada, 2000, and Kimura, 2001).

#### *A modern version*

A suggestion has been made to address the problem of the apparent velocity decline. It has been pointed out that originally Fisher (1911) referred to a transactions equation, which states that the amount of money changing hands to pay for transactions during a given time period must equal the nominal value of these transactions. Considering growth, this can be written as follows:

$$(6) \quad \Delta(PQ) = V\Delta M$$

where M stands for money actually used for transactions and PQ stands for the value of these transactions. Now considering only those transactions constituting GDP (denoted as P<sub>R</sub>Y), we can write:

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<sup>27</sup> Milton Friedman, in his entry under Money: Quantity Theory in the Encyclopaedia Britannica, p. 476.

$$(7) \quad \Delta(P_R Y) = V \Delta M_R$$

where  $M_R$  stands for the money used for transactions that are part of GDP.<sup>28</sup> Thus the value of GDP transactions can only increase, if there is an equal increase in the money used for them. When attempting to employ actual statistics to represent this equation of exchange, we have no difficulty in using nominal GDP, as calculated by the national income accounts, for  $P_R Y$ . However, we find that traditional measures of the ‘money supply’ (such as  $M_1$ ,  $M_2$ , etc.) do not measure money actually used for GDP transactions, but instead subsets of the stock of savings. Thus when money used for financial transactions increases relative to GDP, the traditionally measured velocity will appear to decline. This has been pointed out by Spindt (1985), Allen (1989, 1994), Howells and Biefang-Fisancho Mariscal (1992) and Werner (1992, 1997). Thus a measure of the money supply should be used that can be disaggregated, so that it can abstract from money used for non-GDP transactions. The Bank of England has long used the ‘credit counterparts’ approach as an alternative measure of the stock of money. An emphasis on credit counterparts, as opposed to deposit aggregates, is in line with the expanding literature on the ‘credit view’ or ‘bank lending school’, which argues that credit should not be neglected in macroeconomic analysis, as it may be at least constitute a supplementary transmission mechanism for monetary policy, if not more.<sup>29</sup>

Since bank credit extension creates the deposits that are usually considered in so-called money supply measures, it is valid to utilize the credit counterparts in the quantity equation (this and the following part were first argued by Werner, 1992, 1997). This addresses weaknesses of the previous formulation: Using credit to represent money  $M$  in the equation of exchange (6) and (7) allows us to measure the purchasing power actually used for transactions at any moment in time, as well as to disaggregate it into credit used for GDP transactions ( $M_R$ ) and that used for non-GDP transactions (such as real-estate and other speculative transactions).

Using credit creation to measure  $M$ , equation (6) indicates that economic growth is only possible, if credit is created either via the banking system or the central bank, and used for transactions that are part of GDP. Interest rates are not part of the model. This feature of Fisher’s (1911) model can today be explained with further reference to the ‘credit view’

<sup>28</sup> Following Werner (1997).

<sup>29</sup> See, for instance, Bernanke and Blinder (1988), Bernanke (1993), Gertler and Gilchrist (1993), Bernanke and Gertler (1995), Kashyap and Stein (1997). It is noteworthy that most of this literature does however not explicitly address the ability of banks to create credit, and thus considers banks largely as financial intermediaries with the function to transfer funds from A to B, comparable to the capital markets. This is not how banks are considered in this paper, as their ability to create credit, through the well-known credit creation process, should be taken into consideration.

literature: Relaxing the assumption of perfect information, it has been shown that the credit market may not clear. Markets that do not clear are rationed and hence determined by quantities (following the ‘short-side principle’: whichever of supply or demand is smaller will determine the market outcome). Stiglitz and Weiss (1981) argued that due to the skewed incentive structure of the institutional set-up of limited liability for directors, there is likely to be more demand for money – Keynes’ “unsatisfied fringe of borrowers”.

This allows a monetarist-creditist synthesis, which describes economic growth as a function of the supply of bank and central bank credit. According to equation (6), the high growth of the 1980s in Japan would be explained as resulting from high credit growth. Since credit was also used for non-GDP transactions (especially speculative loans to the real estate sector), and much of these loans turned into bad debts in the early 1990s, banks increasingly became risk-averse. This restricted the supply of credit, also to borrowers that use the purchasing power for GDP-based transactions (consumption, investment). As a result, economic growth declined. The credit shrinkage also resulted in shrinkage of nominal GDP. While credit creation remains weak, equation (6) tells us that GDP growth cannot recover significantly.

In this situation neither lowering interest rates is useful (as it does not increase the supply of credit from risk-averse banks), nor increasing fiscal stimulation (as pure fiscal policy does not create credit): The findings of this model apply in this testable modification. Thus, without an increase in  $M_R$ , there cannot be an increase in nominal GDP:

$$(8) \quad \Delta M_R = 0$$

$$(9) \quad \Delta(P_R Y) = \Delta c + \Delta i + \Delta g + \Delta nx$$

$$(10) \quad \Delta g = -(\Delta c + \Delta i + \Delta nx)$$

In this framework, just as proposed by the early quantity theory literature, fiscal policy cannot affect nominal GDP growth, if it is not linked to the monetary side of the economy: an increase in credit creation is necessary (and sufficient) for nominal growth.

To test the above framework empirically in the case of Japan in the 1990s, we first note that in practice credit creation used for GDP transactions cannot be expected to have been precisely zero during the 1990s. There were periods of significant credit growth (such as in 1996), but also of credit contraction. Thus the more general formulation of the model,

with

$$(11) \quad \Delta M_R > 0$$

is required. Substituting (9) and (10) into equation (7), we obtain the testable proposition:

$$(12) \quad \Delta(c + i + nx) = V\Delta M_R - \Delta g$$

whereby the coefficient for  $\Delta g$  is expected to be approximately  $-1$ . In other words, given the amount of credit creation produced by the banking system and the central bank, an autonomous increase in government expenditure  $g$  must result in an equal reduction in private demand. As the government issues bonds to fund increased fiscal stimulation, private sector investors (such as life insurance companies) that purchase the bonds must withdraw purchasing power elsewhere from the economy. The same applies (more visibly) to tax-financed government spending. With unchanged credit creation, every yen in additional government spending reduces private sector activity by one yen.

We observe a different kind of crowding out than postulated by Keynesian or Ricardian models: Unlike the Keynesian interest rate-based crowding out, and like Ricardian equivalence, it is quantity-based and does not require any particular movement in interest rates. It therefore fits the observation of the 1990s that interest rates did not rise. Unlike Ricardian equivalence, it does not depend on restrictive assumptions about unobservable expectations and their formation. Moreover, it does not operate via a change in household savings. Instead, crowding out occurs due to the lack of new purchasing power supplied by the financial system (credit creation).

The policy advice of this model is clear – and uncontroversial. As Blinder and Solow (1973:323) pointed out, there “is no controversy over government spending financed by printing money. Both sides agree that it will be expansionary”. In the terms of our modified pre-Keynesian model: The Japanese authorities would need to increase credit creation, in order to stimulate growth. This can be done via fiscal policy that is funded by credit creation or other measures, as will be briefly discussed below.

## (b) Empirical Evaluation

*A model of nominal GDP growth*

We proceed to test the above explanation of fiscal policy ineffectiveness. In line with the

general-to-specific empirical methodology, our empirical evaluation should also begin with a general model of nominal GDP growth that includes the variables suggested by alternative approaches, including the money supply and interest rates. This general model is then sequentially reduced to the parsimonious form, which parsimoniously encompasses the alternative models (see Hendry and Mizon, 1978; Hendry, 2000). We formulate a general ADL model of nominal GDP, based on quarterly statistics:

$$(13) \quad \Delta GDP_t = \alpha_j + \sum \beta_j \Delta GDP_{t-j} + \sum \gamma_j \Delta M_{Rt-j} + \sum \delta_j \Delta WPI_{t-j} + \sum \phi_j \Delta MS_{t-j} \\ + \sum \omega_j \Delta HPM_{t-j} + \sum \rho_j \Delta Short_{t-j} + \sum \tau_j \Delta Long_{t-j} + \sum \varphi_j \Delta ODR_{t-j} + \varepsilon_t$$

All variables are in year-on-year percentage differences, with

GDP = nominal GDP

$M_R$  = Credit used for GDP transactions

WPI = Wholesale Price Index

MS = Money Supply, M2+CD

HPM = High Powered Money

Short = Call Rate

Long = 10 year JGB yield

ODR = Official Discount Rate

First, the degree of integration of the variables is tested. Using the augmented Dickey-Fuller test for unit roots, it is found that all series, except interest rates, are SI(1,1). The seasonally differenced natural logarithms are used for the initial general regression model, using the PC-Give software. We then sequentially drop the insignificant variables, while explicitly testing for the validity of these restrictions. The final parsimonious model resulting from this process is (t statistics in parentheses):

$$(14) \quad \Delta GDP_t = 0.004_j + 0.327 \Delta GDP_{t-1} + 0.222 \Delta GDP_{t-3} + 0.407 \Delta M_{Rt} + \varepsilon_t \\ (1.71) \quad (2.53) \quad (2.10) \quad (4.08)$$

The results are reported in Table 4.

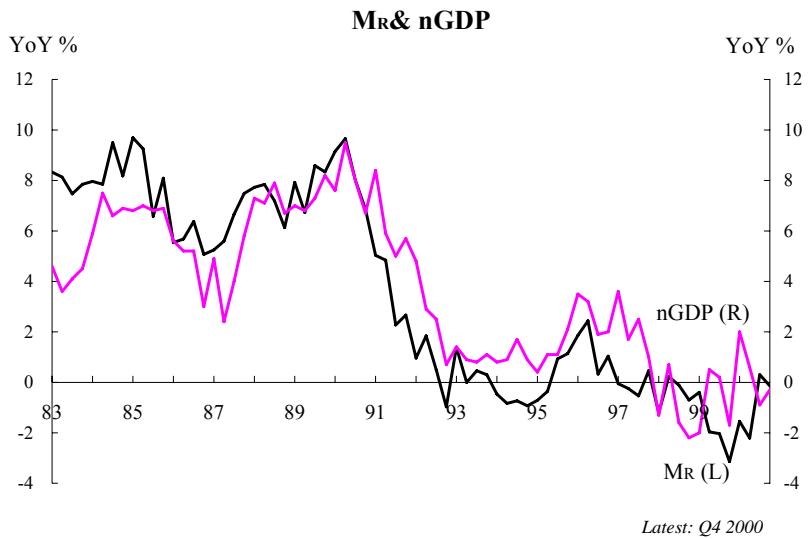
**Table 4. Estimation Results of GDP Model**The estimation sample is: 1990 (1) to 2000 (4); Dependent variable:  $\Delta nGDP$ 

	Coefficient	Std. Error	t-value	t-prob.	Part.R^2
Constant	0.00381350	0.002228	1.71	0.095	0.0683
$\Delta nGDP\_1$	0.326688	0.1293	2.53	0.016	0.1376
$\Delta nGDP\_3$	0.222120	0.1059	2.10	0.042	0.0991
$\Delta M_R$	0.406689	0.09980	4.08	0.000	0.2934

Sigma	0.00995221	RSS	0.00396186124
R^2	0.88463	F(3,40) =	102.2 [0.000]**
log-likelihood	142.502	DW	1.87
no. of obsv.	44	no. of parameters	4
mean( $\Delta nGDP$ )	0.0211887	var(nGDPYoY)	0.000780463

AR 1-3 test:	F(3,37) = 0.45124 [0.7179]	hetero test:	F(6,33) = 0.20716 [0.9721]
ARCH 1-3 test:	F(3,34) = 0.93630 [0.4338]	hetero-X test:	F(9,30) = 0.55406 [0.8229]
Normality test:	Chi^2(2) = 0.13829 [0.9332]	RESET test:	F(1,39) = 0.000462 [0.9830]

The usual statistical diagnostics show that there are no significant problems with the formulation. Furthermore, cointegration tests confirmed that the dependent and explanatory variables were cointegrated, ruling out a spurious correlation. Formal tests for encompassing found that the credit model encompasses alternative theories. In Figure 1 we show the raw data for nominal GDP growth and the key explanatory variable, credit creation used for GDP transactions ( $\Delta M_R$ ). The close correlation of the raw (not fitted) data is visible by eye inspection. Explicit Granger causality tests found that credit Granger-causes nominal GDP growth, but there was no causality in the opposite direction.



**Figure 1.** Credit creation used for GDP transactions ( $M_R$ ) and nominal GDP growth in Japan. Source: Cabinet Office, Government of Japan, and Bank of Japan

*Testing the fiscal policy ineffectiveness proposition*

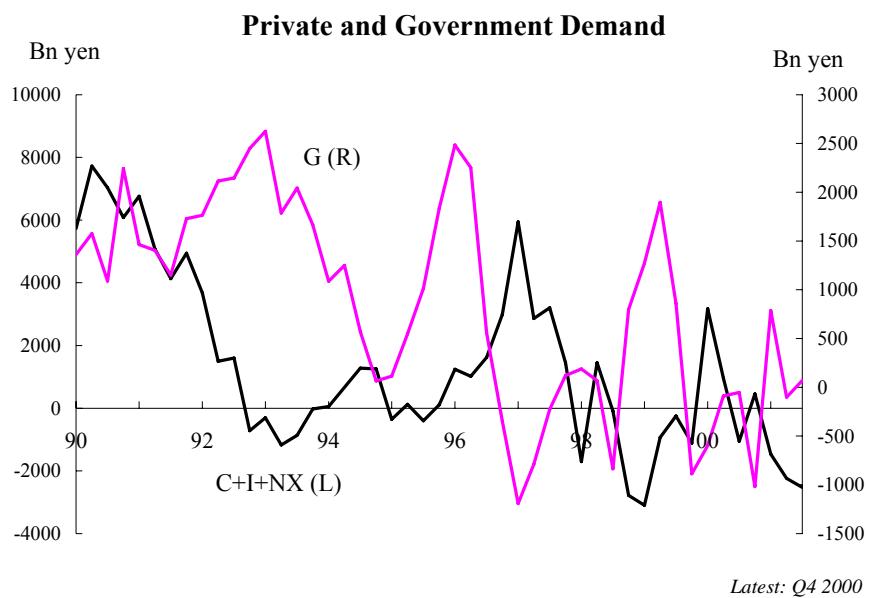
We now proceed to test the fiscal policy ineffectiveness proposition of our model. Substituting the empirical formulation of nominal GDP, as shown in equation (14) into equation (9) and solving for non-government demand, we obtain:

$$(15) \quad \Delta(c_t + i_t + nx_t) = \beta_1 + \beta_2 \Delta GDP_{t-1} + \beta_3 \Delta GDP_{t-1} + \beta_4 \Delta M_{Rt} + \beta_5 \Delta g_t + \varepsilon_t$$

If we have found suitable empirical proxies for our model, a regression would yield the following coefficient for government expenditure:

$$(16) \quad \beta_5 = -1$$

We use year-on-year changes of all variables. Figure 2 shows changes in government spending and private demand. Eye inspection indicates that there is some form of negative correlation. The results of our regression are shown in Table 5.



**Figure 2.** Nominal private demand and government expenditure, absolute growth rates.  
Source: Cabinet Office, Government of Japan

**Table 5. Estimation Results of Private Demand Model**

The estimation sample is: 1990 (1) to 2000 (4); Dependent variable:  $\Delta\text{private}$

	Coefficient	Std. error	t-value	t-prob.	Part.R^2
Constant	430.797	323.8	1.33	0.191	0.0434
$\Delta nGDP\_1$	0.369348	0.1275	2.90	0.006	0.1770
$\Delta nGDP\_3$	0.203399	0.1110	1.83	0.075	0.0792
$\Delta M_R$	0.0151281	0.004390	3.45	0.001	0.2334
$\Delta G$	<b>-0.956970</b>	0.2057	-4.65	0.000	0.3570
Sigma	1233.28	RSS	59317732.9		
R^2	0.823256	F(3,40) =	45.41 [0.000]**		
log-likelihood	-372.946	DW	1.77		
no. of obsv.	44	no. of parameters	5		
mean ( $\Delta\text{private}$ )	1406.38	var ( $\Delta\text{private}$ )	1406.38		

Solved static long-run equation for  $\Delta\text{private}$ :

	Coefficient	Std. error	t-value	t-prob.
Constant	430.797	323.8	1.33	0.191
$\Delta nGDP$	0.572747	0.1048	5.46	0.000
$\Delta M_R$	0.0151281	0.004390	3.45	0.001
$\Delta G$	<b>-0.956970</b>	0.2057	-4.65	0.000

Long-run sigma = 1233.28

ECM =  $\Delta$ private - 430.797 + 0.95697\* $\Delta$ G - 0.572747\* $\Delta$ nGDP - 0.0151281\* $\Delta$ M<sub>R</sub>;

WALD test: Chi^2(3) = 179.476 [0.0000] \*\*

AIC	14.3415	SC	14.5443
HQ	14.4167	FPE	1.69380e+006

When the log-likelihood constant is included:

AIC	17.1794	SC	17.3821
HQ	17.2546	FPE	2.89293e+007

AR 1-3 test:	F-form F(3,36)	=	0.58896 [0.6262]
ARCH 1-3 test:	F(3,33)	=	1.4770 [0.2387]
Normality test:	Chi^2(2)	=	0.68778 [0.7090]
hetero test:	(8,30)	=	1.5833 [0.1717]
hetero-X test:	F(14,24)	=	1.7418 [0.1123]
RESET test:	F(1,38)	=	0.056661 [0.8131]
Skewness		=	-0.17285
Excess Kurtosis		=	-0.025167
Asymptotic test:	Chi^2(2)	=	0.22026 [0.8957]

The coefficient for government expenditure ( $\beta_5$ ) is  $-0.95697$ . Rounding to one digit, we obtain:

$$\beta_5 = -1.0.$$

### Evaluation

The test suggests that for every yen in government spending that is not monetised (i.e. not supported by credit creation), private demand shrank by one yen. The empirical evidence supports the contention of the pre-Keynesian economists that an economic recovery requires monetary expansion, here defined as credit creation. The pre-Keynesian model, in modified form, appears to fit the Japanese experience of the 1990s, in preference to alternative explanations.

### Possible objection

There is a possible objection to this empirical finding: causality may run from private demand to government spending, not the other way round. In other words, while it is suggested here that increased government expenditure has crowded out private expenditure through laying claim on the limited amount of credit available, the government expenditure may have *responded* perfectly to declines or rises in private demand, *in order* to maintain stable growth.

However, there are a number of serious problems with this argument: In this case, the government would have to have perfect knowledge of current gross domestic expenditure, and be able to react simultaneously, during the same quarter, by adjusting government expenditure. However, GDP statistics are only available long after the end of the current quarter. Furthermore, government expenditure is the result of a somewhat complex bureaucratic procedure, which involves budgets drawn up by the Ministry of Finance and the government, which are approved by the Diet. There is no empirical evidence that this process has been fast enough to accommodate potential current-quarter changes in spending needs. More often than not, politicians appear happy if they can respond within the same fiscal year to perceived changes in public spending needs. Thirdly, and perhaps most damaging to this alternative explanation, if the government expenditure did not in fact crowd out private demand, as suggested by our credit model, but instead the government counteracted changes in private demand perfectly, then this argument would imply that government expenditure was, after all, effective in changing total output and employment. If that was the case, then why did the government, apparently well-informed and infinitely fast in its short-term spending policies, not use its allegedly highly stimulatory fiscal policy to achieve the declared government policy goal of stimulating an economic recovery? If fiscal policy had the desired effects, as this argument suggests, and could counteract any change in private demand, then why did the government use it to create negative nominal GDP in 1998, 1999, 2001 and 2002? Why did the government implement a contraction of nominal GDP by over 1% in those years? A large number of auxiliary assumptions – most of them highly implausible – are required to rescue this counter-argument. The fundamental principle of parsimony suggests that the proposed explanation should be considered preferable.

### (c) Policy Implications

The finding suggests that Japanese fiscal policy has been ineffective during the 1990s, because it was not supported by monetary policy. The central bank could act to increase credit creation, and hence stimulate the economy, by raising its net open market purchase operations. For instance, the Bank of Japan could have sufficiently increased its bond purchases.<sup>30</sup> Policies to stimulate bank credit creation could also have been adopted. Here, the central bank could have been more helpful, for instance by utilizing its unique status to

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<sup>30</sup> Hayashi (1998) argues that the central bank is essentially an agency that certain functions have been delegated to by the government. In this case it does not make sense for the government to issue bonds and pay interest for its borrowing, if it could instead ask the central bank to print money and pay for fiscal policy through costless, interest free money creation. Hence the government could “exchange interest-bearing government bonds with interest free reserves through the central bank’s purchase of government bonds”, as paraphrased by Okina (1999, p. 172).

solve the bad debt problem. Given these findings, it appears central bank policy has not been as helpful as it could have been. The lack of incentives to coordinate monetary policy with the government's fiscal policy may be one of the disadvantages of central bank independence.<sup>31</sup>

There is a policy for governments to monetise fiscal policy even without cooperation from the central bank. The method, first suggested by Werner (1996, 1998, 2000a, 2000b) renders fiscal policy effective, according to the above model. Without the cooperation of the central bank, money-financed fiscal policy is not an option. However, credit-financed fiscal policy is possible: the Ministry of Finance could cover the public sector borrowing requirement by substituting bond finance with borrowing from the private sector commercial banks. This would increase credit creation and, according to the above model, stimulate the economy.

There are objections to this proposal. Hawtrey, before the Macmillan Committee of 1930, "considered the 'radical' idea of government spending out of new bank credit, but predicted that the result of such a policy would be inflationary, and a threat to the gold standard, thus forcing up the bank rate of interest and causing credit contraction. [It]... would mean the end of cheap money for free enterprise."<sup>32</sup> However, Hawtrey's objection is predicated on the assumptions that (a) the market for credit is in equilibrium, so that interest rates respond proportionately to an increase in the demand for credit; and/or (b) that banks are merely financial intermediaries that cannot create new credit, so that any extension of bank loans to the government must be at the expense of bank lending to alternative uses. However, both assumptions are unlikely to hold: the theoretical literature has provided ample arguments for the case of a rationed credit market, whereby interest rates do not respond proportionately to changes in the demand for money. Furthermore, the institutional reality of banking systems allows banks to create new purchasing power without withdrawing existing purchasing power from other parts of the economy. Empirically, the Japanese example has also disproved Hawtrey's assumptions: Using Japanese data, no evidence can be found that interest rates are in an inverse relationship with the quantity of bank loans extended. Furthermore, Japanese banks currently have excess reserves of over Y30 trn with the central bank, and they continue to reduce bank lending. They have ample opportunity to increase lending without withdrawing loans from

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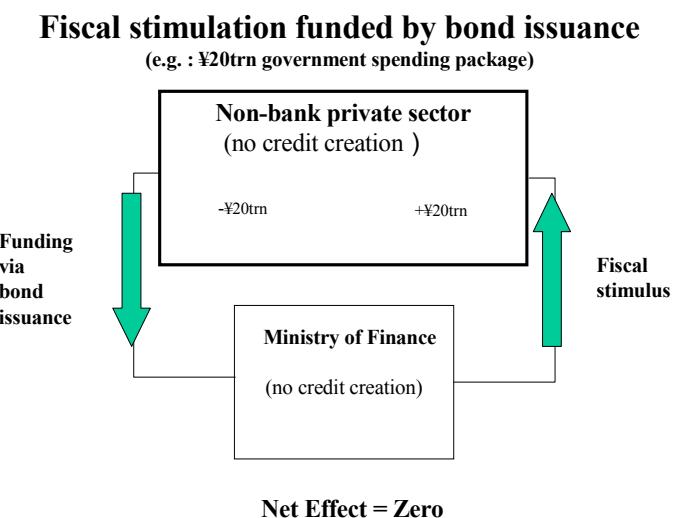
<sup>31</sup> Independence is not necessarily an obstacle, since a central bank can voluntarily cooperate to support the government's policy. As Bernanke (2000) pointed out, "Cooperation with the fiscal authorities in pursuit of a common goal is not the same as subservience" (p. 163). Unfortunately, there are few examples of such cooperation by independent central banks.

<sup>32</sup> Klein (1968), as quoted by Spencer and Yohe (1970:15). It is not made explicit who had launched this 'radical idea'. However, there is some evidence that it may have emerged from the German credit school of economists. It is noteworthy that this 'radical' idea was successfully implemented in Germany in the 1930s.

current borrowers.

Thus funding of fiscal expenditure by borrowing from banks would increase credit creation and hence the total amount of purchasing power in the economy. As a result,  $M_R$  in equation (7) above would rise, which would, in turn, boost nominal GDP. By shifting government funding away from bond finance and replacing it with borrowing from the commercial banks via simple loan contracts, credit creation will be stimulated.<sup>33</sup> Unlike bond markets, banks create new purchasing power when they lend. This means that overall economic activity can be boosted (via fiscal policy), without any quantity crowding out that rendered fiscal policy ineffective during the 1990s.<sup>34</sup>

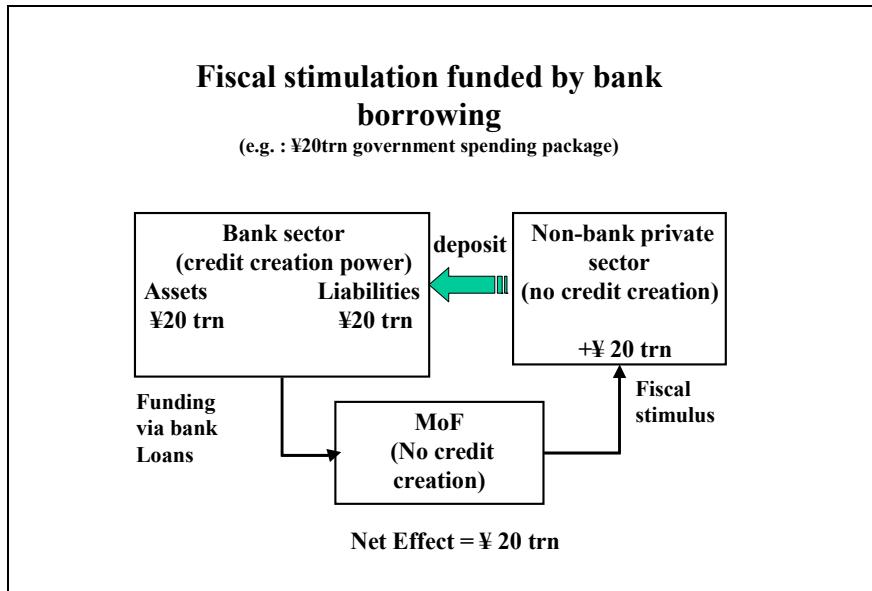
Figures 3 and 4 are used to illustrate the difference between stimulatory fiscal policy – here the example of a fiscal spending package – funded via bond issuance taken up by investors, such as life insurers, and stimulatory fiscal policy that is backed by credit creation.



**Figure 3.**

<sup>33</sup> This is effectively the policy combination adopted by the Reichsbank from 1933 to 1937. Its President, Hjalmar Schacht, appeared to have been well aware of the quantity crowding out problem of unmonetised fiscal policy. In addition to stepping up the credit creation of the Reichsbank (by purchasing various forms of assets, including government bonds and bonds of other government institutions), Schacht instructed the establishment of government institutions that implemented fiscal spending programmes and were funded by the issuance of bills of exchange that were purchased by the banks and the central bank. Funding fiscal expenditure with money creation, as opposed to public bond auctions is called ‘silent funding’ (*geraeuschlose Finanzierung*) in the German tradition.

<sup>34</sup> The Werner (1996, 1998) proposal is supported and seconded by economists such as Congdon (2001), Smithers (2001) and the Financial Times’ Martin Wolf (2002).



*Figure 4.*

Although the central government funded parts of the 1998 budget from banks, this has remained negligible. With the majority of bond issuance taken up by the non-bank private sector (which does not have the power to create credit), fiscal spending had to crowd out private activity.

#### 4. Conclusion and Further Research

The proposed alternative model has provided an answer to the question why fiscal policy has appeared ineffective during the 1990s. The empirical findings presented in this paper indicate that, given unchanged monetary conditions, fiscal policy and domestic demand may be inversely related. There appears to be evidence for complete crowding out of fiscal expenditure, even in situations where interest rates do not rise. The crowding out transmission mechanism does not operate via interest rates, but the quantity of purchasing power claimed by the government.

The proposed framework creates common ground between proponents of Keynesian views (as held, among others, by Blinder and Solow), monetarist views (as held in particular by Milton Friedman) and those of leading contemporary macroeconomists (such as Mankiw).

The implication for the present government expenditure packages are that private demand is likely to be crowded out, as bond issuance rises substantially. Thus the unintended consequence of the government's well-intentioned initiative may be to trigger a significant downturn in private sector demand and hence the overall economy: in the case where government expenditure is used to substitute for past losses (in the form of unrealized losses on bank balance sheets), there will not even be the gross stimulating effect of government expenditure policies, and hence only a net negative effect of the crowding out.

Put simply, the government is draining money from the private sector and uses it to plug the holes in banks' balance sheets. *Ceteris paribus* this will reduce economic growth.

There is a solution, however, which would enable the government to achieve its goal to support the economy, without negative side-effects on private demand. Two possibilities exist, listed in preferred order:

1. Instead of the government, all measures to support the banking system through asset and equity purchases, as well as compensation for depositors, etc. should be defrayed by the central bank for its own account, and not become a liability of the government. In addition to avoiding increased national debt and the compounding interest on it, this would not result in any crowding out of private demand (see Werner, 2005).
2. If politically, the above option is unrealistic, a second-best option would be for the government to undertake the fiscal expenditures, but not fund them through the issuance of bonds or bills. Instead, a syndicated loan should be arranged from the banking system. This may sound counter-intuitive: the government would be borrowing from banks to give money to banks. However, such a programme would increase bank credit creation, and hence not crowd out private demand, whereas bond issuance is likely to.

## **Bibliography:**

Andersen Leonall C. and Keith M. Carlson (1970), A monetarist model for economic stabilization, *Federal Reserve Bank of St. Louis Review*, vol. 52, April, pp. 7-25

Andersen Leonall C. and Jerry L. Jordan (1968), Monetary and fiscal actions: A test of

their relative importance in economic stabilization, *Federal Reserve Bank of St. Louis Review*, November, pp. 11-23.

Asako, K., T. Ito and K. Sakamoto (1991), The rise and fall of the deficit in Japan, *Journal of Japanese and International Economies*, volume 5, pp. 451-472

Aschauer, David (1985), Fiscal policy and aggregate demand, *American Economic Review*, vol. 75, no. 1, March, pp. 117-127

Bank of Japan (1988), Nihon ni okeru mane sapurai no juyousei ni tsuite, *Chousa Geppou*, February, p. 1-24.

Barro, Robert J. (1974), Are government bonds net wealth?, *Journal of Political Economy*, vol. 82, November/December, pp. 1095-1117.

Barry, Frank and Michael B. Devereux (2003), Expansionary fiscal contraction: A theoretical exploration, *Journal of Macroeconomics*, vol. 25, no. 1, pp. 1-23.

Bayoumi, Tamim (1998), The Japanese Fiscal System and Fiscal Transparency, in Bijan B. Aghevli, Tamim Bayoumi and Guy Meredith (1998), *Structural Change in Japan: Macroeconomic Impact and Policy Challenges*, Washington: International Monetary Fund.

Bergman, U. Michael and Michael M. Hutchison (1997), Economic expansions and fiscal contractions: International evidence and the 1982 Danish stabilization, UCSC Dept. of Economics Working Paper Series, WP 386, University of California at Santa Cruz.

Bernanke, Ben S. (1993), Credit in the macroeconomy, *Quarterly Review, Federal Reserve Bank of New York*, vol. 18, no. 1, Spring, pp. 50-70.

Bernanke, Ben S. (2000), Japanese monetary policy: A case of self-induced paralysis?, in: Ryoichi Mikitani and Adam S. Posen (2000), *Japan's Financial Crisis and its Parallels to US Experience*, Special Report 13, September, Institute for International Economics, Washington, D.C.

Bernanke, Ben S. and Alan S. Blinder (1988), Credit, money and aggregate demand, *American Economic Review, Proceedings*, vol. 78, May, pp. 435-39.

Bernanke, Ben S. and Mark Gertler (1995), Inside the black box: The credit channel of monetary policy transmission, *Journal of Economic Perspectives*, vol. 9, no. 4, Fall, pp. 27-48.

Blinder, Alan S. and Robert M. Solow (1973), Does fiscal policy matter?, *Journal of Public Economics*, vol. 2, pp. 319-337.

Boughton, James M. (1991), Long-run money demand in large industrial countries, *IMF Staff Papers*, vol. 38, no. 1, March, pp. 1-32.

Brunner, Karl and Allan Meltzer (1976), An aggregate theory for a closed economy, in Jerome Stein, ed., *Monetarism*, Amsterdam: North-Holland Publishing Co.

Christ, Carl F. (1968), A simple macroeconomic model with a government budget restraint, *Journal of Political Economy*, vol. 76, January, pp. 53-67.

Congdon, Tim (2001), Money and the Japanese Economic Crisis, Lombard Street Research Monthly Economic Review, August; as quoted by Guido Zimmermann, Deflation und Geldpolitik in Japan: Was laeuft falsch?, Japan Analysen Prognosen Nr. 185, May 2002, Japan-Zentrum der Ludwig-Maximilian-Universitaet Muenchen, Munich

Dalsgaard, Thomas, Christophe Andre and Pete Richardson (2001), Standard shocks in the OECD Interlink model, OECD working paper 306, Paris: Organisation for Economic Cooperation and Development

Dornbusch, Rüdiger and Stanley Fischer (1987), *Macroeconomics, International Edition*, Singapore: MacGraw-Hill Book Company.

Fisher, Irving (1911), *The Purchasing Power of Money*, New York

Friedman, Benjamin M. (1978), Crowding out or crowding in? Economic consequences of financing government deficits, *Brookings Papers on Economic Activity*, vol. 3, pp. 593-641.

Friedman, Milton (1956), The quantity theory of money: A restatement, in: Milton Friedman (ed.), *Studies in the Quantity Theory of Money*, Chicago: University of Chicago Press.

Friedman, Milton (1970), A theoretical framework for monetary analysis, *Journal of Political Economy*, March/April, vol. 78, no. 2, pp. 193-238.

Gertler, Mark and Simon Gilchrist (1993), The role of credit market imperfections in the monetary transmission mechanism: Arguments and evidence, *Scandinavian Journal of Economics*, vol. 109, May, pp. 309-40.

Giavazzi F. and M. Pagano (1990), Can severe fiscal contractions be expansionary tales from two small European economies?, in Olivier J. Blanchard, and Stanley Fischer (eds.), *NBER Macroeconomics Annual*.

Goldfeld, Stephen M. and Daniel E. Sichel (1990), The demand for money, in: B. M. Friedman and F. H. Hahn (eds), *Handbook of Monetary Economics*, Vol. I, pp. 300-356, Elsevier Science Publishers

Goodhart, Charles A. E. (1989), The conduct of monetary policy, *Economic Journal*, vol. 99, June, pp. 293-346.

Handa, Jagdish (2000), *Monetary Economics*, London: Routledge

Hansen, Bent (1973): "On the Effects of Fiscal and Monetary Policy: A Taxonomic Discussion". *American Economic Review*, vol. 63, no. 4, pp. 546-571.

Hayashi, Fumio (1998), Keizai Kyoshitsu - Nichigin, base money no mokuhyo wo (The BoJ should set a base money target), *Nihon keizai Shinbun*, December 29

Hendry, David F. (2000), *Econometrics: Alchemy or Science?* Oxford: Oxford University Press.

Hendry, David F. and G. E. Mizon (1978), Serial correlation as a convenient simplification, not nuisance: A comment, *Economic Journal*, vol. 88, pp.549-563.

Hoelscher, Gregory (1986), New Evidence on deficits and interest rates, *Journal of Money, Credit and Banking*, February

Hoshi, Takeo and Hugh Patrick (2000), The Japanese financial system: An introductory

overview, in: Takeo Hoshi and Hugh Patrick (eds.) (2000), *Crisis and change in the Japanese financial system*, Norwell, Kluwer Academic Publishers

Hutchison, Michael and David Pyle (1984), The real interest rate/budget deficit link, Federal Reserve Bank of San Francisco, *Review*, Fall

Ihori, Toshihiro, Takero Doi and Hiroki Kondo (2000), Japanese fiscal reform: fiscal reconstruction and fiscal policy, Discussion Paper CIRJE-F-83, University of Tokyo.

International Monetary Fund (1998), Japan – Selected Issues, IMF Background Paper No. 98/191, Washington: International Monetary Fund.

Ishida, K., 1984, “Divisia monetary aggregates and demand for money: A Japanese case,” Bank of Japan Monetary and Economic Studies2, 49-80.

Ito, Takatoshi (2000), The stagnant Japanese economy in the 1990s: the need for financial supervision to restore sustained growth, in: Takeo Hoshi and Hugh Patrick (eds.) (2000), *Crisis and change in the Japanese financial system*, Norwell, Kluwer Academic Publishers

Kashyap, Anil K. and Jeremy C. Stein (1997), The role of banks in monetary policy: A survey with implications for the European monetary union, *Federal Reserve Bank of Chicago Economic Perspectives*, September/October, pp. 2-18.

Keran Michael W. (1969), Monetary and fiscal influences on economic activity – The historical evidence, *Federal Reserve Bank of St. Louis Review*, vol. 51, November, pp. 5-24.

Keran Michael W. (1970), Monetary and fiscal influences on economic activity – The foreign evidence, *Federal Reserve Bank of St. Louis Review*, vol. 52, February, pp. 16-28.

Keynes, John Maynard (1930), *A Treatise on Money*, vol. I and vol. II, London: Macmillan

Keynes, John Maynard (1932), *Essays in Persuasion*, New York: Harcourt, Brace and Company

Klein, Lawrence R. (1968), *The Keynesian Revolution*, London: Macmillan.

Koo, Richard (1995), Keizai Kyoushitsu: Kouzouhenka taiou, teokurefusege, *Nihon Keizai Shinbun*, 11 January

Koo, Richard (1999), *Nihonkeizai kaifukue no aoshashin*, PHP Kenkyujo, Tokyo

Kimura, T. (2001) “The impact of financial anxieties on money demand in Japan”, in Klöckers H.J. and C. Willeke (eds.) *European Central Bank, Seminar on Monetary Analysis: Tools and Applications*, ECB, Frankfurt am Main, pp. 97-144.

Krugman, Paul (1998), It's Baaack: Japan's slump and the return of the liquidity trap, *Brookings Papers on Economic Activity*, no. 2, 1998, pp. 137-205

Kuttner, Kenneth N. and Adam S. Posen (2002), Passive savers and fiscal policy effectiveness in Japan, working paper 02-2, Washington: Institute for International Economics

Lerner, Abba P. (1943), Functional finance and the federal debt, *Social Research*, vol. 10, no. 1, February, pp. 38-52.

Ludvigson, Sydney (1996), The macroeconomic effects of government debt in a stochastic growth model, *Journal of Monetary Economics*, vol. 38, pp. 25-45.

Mankiw, Gregory (1994), *Macroeconomics*, 2nd ed. New York: Worth

McKibbin, Warwick J. (1996), The macroeconomic experience of Japan since 1990: An empirical investigation, Economics Department, Research School of Pacific and Asian Studies, Australian National University, mimeo

Miyao, R. (1996), “Does a cointegrating M2 demand relation really exist in Japan?”, *Journal of the Japanese and International Economies*, 10, pp. 1-10.

Nagatani, Yasutaka (1996), Keizai Kyoushitsu: Yakuwari hatashita ‘keiki taisaku’, *Nihon Keizai Shinbun*, 16 February 1996

Nonomiya, Lily (2009), Japan's Debt Ratio to Rise to 197% of GDP Next Year, OECD Says, Bloomberg, 31 March 2009; accessed at:

<http://www.bloomberg.com/apps/news?pid=20601101&sid=aDDufj4SrzYo>

Okina, Junio (1999), Monetary policy under zero inflation: A response to criticisms and questions regarding monetary policy, *Monetary and Economic Studies*, December 1999, Bank of Japan, Tokyo

Perri, Fabrizio (1999), The Role of Fiscal Policy in Japan: A Quantitative Study, Working Paper 99-16, New York: New York University Leonard N. Stern School of Business.

Posen, Adam (1998), *Restoring Japan's Economic Growth*, Institute for International Economics, Washington, D.C.

Ramaswamy, Ramana and Christel Rendu (2000), Identifying the Shocks: Japan's Economic Performance in the 1990s, in Tamin Bayoumi and Charles Collyns (2000), *Post-Bubble Blues: How Japan Responded to Asset Price Collapse*, Washington: International Monetary Fund.

Sawamoto, Kunihiro and Nobuyuki Ichikawa (1994), Implementation of monetary policy in Japan, in: Tomas J. T. Balino and Carlo Cottarelli (eds.), *Frameworks for Monetary Stability*, International Monetary Fund, Washington, D.C.

Smithers, Andrew (2001), The importance of funding policy for Japan's recovery, Smithers & Co., 29 September; as quoted by Guido Zimmermann, Deflation und Geldpolitik in Japan: Was laeuft falsch?, Japan Analysen Prognosen Nr. 185, May 2002, Japan-Zentrum der Ludwig-Maximilian-Universitaet Muenchen, Munich

Spencer, Roger W. and William P. Yohe (1970), The "crowding out" of private expenditures by fiscal policy actions, *Federal Reserve Bank of St. Louis Review*, vol. 52, October, pp. 12-24.

Stiglitz, Joseph and Andrew Weiss (1981), Credit rationing in markets with imperfect information, *American Economic Review*, vol. 71, no. 3, pp. 393-410

Tatom, John (1985), Two views of the effects of government budget deficits in the 1980s, Federal Reserve Bank of St. Louis, *Review*, October

Walker, W. Christopher (2002), Ricardian equivalence and fiscal policy effectiveness in Japan, *Asian Economic Journal*, vol. 16, no. 3, pp. 285-302.

Werner, Richard (1992), A quantity theorem of disaggregated credit, with evidence from Japan, paper presented at the Royal Economic Society Annual Conference, April 1993, University of York

Werner, Richard (1996), *Economic Quarterly*, Jardine Fleming Securities Ltd., Tokyo

Werner, Richard (1997), A quantity theorem of disaggregated credit, with evidence from Japan, *Kredit und Kapital*, vol. 30, no. 2, July, pp. 276-309.

Werner, Richard (1998), Minkan gingkou kara no kariire de, keikitaisaku wo okonaeba ‘issekinichou’, *Shuukan Economist*, 14 July, Mainichi Shinbunsha, Tokyo

Werner, Richard (2000a), Seifu no minkanginkou kara no kariireseisaku wo kangei suru, *Shuukan Economist*, 7 March, Mainichi Shinbunsha, Tokyo

Werner, Richard (2000b), Japan’s plan to borrow from banks serves praise, *Financial Times*, 9 February

Werner, Richard (2005), *New Paradigm in Macroeconomics*, Basingstoke: Palgrave Macmillan

Wolf, Martin (2002), How to avert a ratings disaster, *Financial Times*, 27 March 2002

Yamada, H. (2000), “M2 demand relation and effective exchange rate in Japan: a cointegration analysis”, *Applied Economic Letters*, 7, pp. 229-232.

Yoshida, Kazuo (1996), Keizai Kyoushitsu: Mato hazure data ‘keiki taisaku’, *Nihon Keizai Shinbun*, 25 January

Yoshitomi, Masaru (1996), Keizai Kyoushitsu: Zaisei, kouzouakaji no teichaku fusege, *Nihon Keizai Shinbun*, 26 February

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