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Economic Issues and Data Problems**

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Abstract:

We survey contributions to the analysis of household liabilities, highlighting relevant theoretical aspects and outlining how data sources may support empirical testing and measurement efforts. Specifically, we classify aspects of household debt, discussing the theoretical and policy relevance of heterogeneity across individual and country dimensions. Aiming to illustrate conceptual and measurement issues, we refer to the approaches and results of some recent relevant country-specific work on administrative and survey data, and we argue that research in this area would greatly benefit from availability of appropriately classified household liabilities data and of cross-country institutional information.

JEL Classification: G1, E21

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1. Introduction

Household debt is on the rise in terms of numbers of households that have outstanding liabilities, of numbers of credit instruments available and used, and in terms of the total debt owed (both in levels, and relative to income). Table 1, which is based on national accounts data that are only available for a few countries, suggests that while the bulk of credit to households is extended in the form of mortgages, unsecured credit has seen some of the most spectacular growth rates.

Growing interest by researchers and policymakers mirrors such empirical patterns. Macroeconomic influences on the phenomenon are fairly clear. Kent, Ossolinski and Willard (2007), for instance, examine national accounts data seeking to explain the dynamics of aggregate household debt holding across countries, finding that a general trend towards lower inflation and lower real interest rates, possibly coupled with such demographic factors as population ageing, can account for some of the wide observed variation. That and other recent studies also explore the macroeconomic policy implications of changes in macroeconomic and financial market conditions (easing of credit constraints, lower unemployment risk, etc), highlighting risks entailed by higher exposure of households to adverse shocks in the future. Household balance-sheets' vulnerability is increased by high debt levels, all the more so if increasing indebtedness is rooted in unduly optimistic expectations based on favourable conditions of the recent past. Improving researchers' and policymakers' understanding of changes in household debt holding is all the more important as the Summer 2007 financial turmoil actually may indicate market participants' limited ability to gauge correctly households' borrowing capacity and repayment ability, even in the United States and other Anglo-Saxon countries where high and increasing levels of household debt have been observed for at least a couple of decades.

Controlling for microeconomic structural factors and for heterogeneity in both preferences and constraints, however, is especially important both for the purpose of assessing welfare implications, and for that of ensuring comparability of aggregate data across countries. Household indebtedness is a more recent and very fast-growing phenomenon in other industrialized countries. Internationally comparative empirical research on the topic would potentially be very fruitful, but is very much less developed than on policy-relevant aspects of country-specific institutions and outcomes in other fields of macroeconomics. Only a very limited amount of such comparative work has been done in the literature. The volume by Guiso, Haliassos, and Jappelli (2002) offers detailed country-specific empirical studies of household portfolios, but pays only limited attention to their liability side. The volume by Bertola, Disney and Grant (2006) focuses specifically on consumer credit demand and supply, but the cross-country empirical evidence reported and discussed by Crook (2006) and Jentzsch and Riesta (2006) is admittedly scant and imprecisely measured. More than in other fields, empirical

research on consumer credit and household debt issues is hampered by the availability of suitably comparable data.

In this paper, we discuss the conceptual and practical issues underlying this unfortunate situation. The academic literature has adopted a variety of approaches to exploiting administrative sources and household survey data. In order to understand and appreciate the literature's research directions, it is useful to outline – as we do in this paper – the relationship between available data definitions and sources, and the type of data economists working on household debt issues may ideally want to be able to access in order to study fruitfully institutional and market mechanisms that bear on welfare- and policy-relevant aspects of microeconomic and macroeconomic interactions.

To assess the usefulness of defining and measuring various characteristics of credit instruments, it is important to understand how they bear on economic behaviour. On the demand side, the microeconomic relevance of consumer debt is theoretically obvious in light of the fact that household credit can provide substantial welfare gains, as it enables consumption possibilities that are not available otherwise. Households use credit to finance purchases of durable consumer goods and houses, and they use it to bridge temporary drops in income, for instance over the business cycle. For different purposes, different types of credit with varying characteristics have become available and households use them to address specific needs. Next to mortgages and other forms of collateralised credit, unsecured forms of debt such as credit card balances and checking account overdrafts are among the standard debt instruments in reach for individual households. Other types of credit type instruments have been developed that are partly linked to particular assets or insurances.

On the supply side, increasingly sophisticated credit scoring methods and financial engineering of new and sometimes fairly opaque securities has vastly increased credit availability, especially in the recent phase of globally high liquidity and extremely low interest rates in many industrialized countries. Increasing sophistication and disintermediation, however, may in some cases result in more poorly informed household decisions, as understanding credit instrument characteristics becomes more important while information does not necessarily become more accessible to households. From the macroeconomic point of view, easier access to debt instruments by households can be stabilizing if the absence of liquidity constraints allows aggregate consumption to smooth out the aggregate demand implications of productivity shocks and other sources of cyclical fluctuations. But it can also be destabilizing if financial liberalization leads to more pronounced boom-bust cycles in the financial sector of the economy, as access to more or less plentiful debt can act as a multiplier of poorly informed or less than fully rational expectation changes. Whether indebtedness has stabilizing or destabilizing influences on average is empirically unclear, as examples of both can be found in the few countries with a sufficiently long history of formal consumer debt development. And it certainly

depends in theory on details of debt instruments, such the extent of collateralization, liquidity, and maturity, that are poorly measured in available data.

Policy issues are also clearly apparent in that there is a substantial heterogeneity across countries as regards the type of credit instruments available to typical households. As financial markets become more and more integrated—especially among the member countries of the Euro zone—credit instruments developed in one country may also become available in others. This, however, crucially depends on country-specific government regulation and cross-border restrictions, as well as international harmonization of tax systems and labour markets. Institutional idiosyncrasies do contribute largely to explaining the cross-sectional heterogeneity in terms of availability, design and use of different credit types. Thus, caution should be exercised in designing internationally comparable databases on household asset and debt holdings. It is particularly important to take into account incentives provided by institutions, such as the tax system, when assessing the credit portfolio of households, devising appropriately different questionnaires across countries.

2. Economic Aspects: Aims of research on household debt data

In this first section, we sketch some of the implications of economic theory's approach to credit for data requirements. We proceed in the next section to classify credit instruments in terms of relevant characteristics, before describing the main components of household debt portfolios found in real data. Lastly, we discuss measurement issues for different (administrative vs. survey) data sources, and we identify particularly valuable types of information. A short conclusion summarizes our main points.

2.1 Consumption, Liabilities, Assets

The demand for credit, however defined, is ultimately derived from the underlying plan for consumption and its deviation from incomes and expenditures. From the life-cycle point of view, equalization of discounted marginal utilities of consumption over time implies positive demand for credit at times when current income and liquid assets (accumulated by past savings) fall short of consumption wishes. This also includes situations where expenditure and consumption are not simultaneous, such as in the case of durable goods purchases. In general, demand for credit depends on characteristics of the income path (in particular, timing, volatility and growth), and of the attitudes of consumers towards risk and time. Just like savings can be spent later, debt entails repayment, hence interactions between time preference and income growth are of course similar as regards household liabilities and household assets.

As we will discuss in more detail below, however, different debt and asset vehicles are likely to differ qualitatively in several key respects. Some household assets, notably stocks, are subject to nominal capital gains or losses; many household assets (such as housing and other durables) provide direct consumption services, and some may serve as conspicuous signals to peers and neighbours. Debt may

not be comfortable for households (and stigma may arise from bankruptcy). And it is typically fixed in nominal terms (at least the principal, perhaps not the interest). The same is true of some household assets, but nominal bond holdings are more liquid than debt, which rarely has a market value at the level of the individual household: while assets can be accumulated by means of depressing consumption, incurring debt requires finding a lender who is willing to lend at conditions acceptable to the borrower. Supply restrictions lead to liquidity constraints, also in terms of interest rate differentials between positive and negative (short sales) balances on the same underlying portfolio item.¹ In general, the menu of debt instruments is likely to be more severely constrained than the menu of assets: in other words, borrowing constraints are more prevalent than “lending constraints” resulting from limited access to assets. Hence, a consumer’s intertemporal optimality conditions are violated in a specific direction, with important implications for behaviour not only at times when constraints are binding but also in anticipation of possibly binding constraints in the future. Such asymmetries accompany consumers throughout their life—at the end of which assets, but not debt (if greater than assets), can be passed on to future generations.

2.2 The Household Debt Portfolio

Keeping in mind such realistic distinctions, however, in order to appreciate issues arising when defining and measuring various types of assets and liabilities, it may be helpful to first picture a situation where all kinds of uncertainties, indivisibilities, tax distortions, transactions costs, liquidity constraints, short sales constraints, information asymmetries and other conceivable frictions and imperfections are absent. In such a world, each asset would yield the same return, and each asset’s value would correspond to the net present value of its annuity service flow. In the extreme, there would not even be need to distinguish owning from renting, to distinguish mortgages from bank account overdrafts, to tell credit cards from jewelry, savings from borrowing, as each of them could be costlessly and instantly converted from one form to another and from there to consumption. In the absence of financial market imperfections, what counts is net worth (including human capital) as a function of age of the individual investor, and portfolio choices are analytically separable from consumption decisions.

In reality, of course, it is just because financial markets are imperfect that various forms of assets are conceptually distinct from various forms of liabilities. At a second, institutional level, one will also observe substantial differences between various countries, or possibly within countries, as tax laws, designs and market structures of financial markets, and the actual workings of the economy and its political-judicial frame provide different incentives for the individual consumer-investor household to structure their asset and debt portfolios. Relevant interactions between interest rate, credit constraints,

¹ Relevant theoretical papers are Artle and Varaya (1978), Mariger (1987), and Deaton (1991), early empirical studies include Zeldes (1989) or Runkle (1991)

housing and durable goods, and adjustment costs cannot be surveyed here, and are very complex (see Bertola, Disney, Grant, 2006).

Juster and Shay (1964) noted that interest rates are different on consumers' assets, liabilities, and durable purchases. They characterized qualitatively the implications of this state of affairs for consumer choices, and explored survey data empirically, focusing in particular on the sensitivity of aggregate consumption to changes in macroeconomic monetary conditions. While the extensive literature analysing consumers' constrained borrowing mostly did not follow up on these early efforts, focusing on simple quantity constraints instead, there are a few notable exceptions: Attanasio (1995) stresses the importance of cash outlays for liquidity constrained consumers, who are prepared to pay higher interest rates in exchange for longer loan duration; and Brugiavini and Weber (1994) and Alessie, Devereux, and Weber (1997) also analyse empirical relationships between borrowing opportunities and durable-good purchases. These and other contributions propose and study models where borrowing opportunities depend on the existing stock of durable goods. Bertola, Guiso and Pistaferri (2005) focus on the role of uncertainty in shaping durable and nondurable expenditure patterns and in their data, credit restrictions do not appear to be binding.

To characterize how data may be useful for research, it is important to keep in mind the final goals of scientific work on the relevant issues. Portfolio behaviour depends on tastes and environment, and researchers and policy makers are interested in disentangling the two; characterizing tastes makes it possible to evaluate welfare, and disentangling the effects of various environmental features opens the way to intervention meant to alter them. Gollier (2002) offers a thorough, analytically tractable characterization of optimal household portfolio behaviour (see also Haliassos and Michaelides, 2002, for numerical methods and results). Like all individual choices, the amount and composition of a household's assets depend on "tastes and technology"—on the objective, and on the constraints, of the relevant maximization problem. In the specific case of a household saving/borrowing and portfolio behaviour, it is useful to characterize the object of maximization in terms of the curvature of the utility function and of its derivatives, and in terms of the length of the planning horizon. Very relevant and well-explored aspects of a household's constrained possibilities set pertain to the volatility, correlation, and mean-reversion characteristics of labour income streams and asset returns. Many of the issues on which research on household liabilities must focus, however, pertain to the list 'other factors' briefly discussed in Gollier's Section 1.6 (liquidity constraints, transaction costs, taxation) and to other elements of market incompleteness and imperfection.

A meaningful distinction can be drawn between (for example) the financial circumstances of a household that owns a large house and owes large mortgage debt, and those of a household holding a less valuable house and a similarly smaller mortgage: and such a distinction in terms of circumstances is meaningful because each of the situations can be determined by the history of asset returns and past

household choices, and by the difficulty of switching between those and other portfolio configurations, rather than by heterogeneous household tastes.

In order to organize data amenable to international comparison, documenting the latter factors (and taking tastes as given) is likely to be very productive, and certainly more policy-relevant than a characterization of how behaviour may depend on detailed characteristics of utility functions. There exists interesting comparative work on the role of ‘tastes’, as accounted for by ethnic origin and other background characteristics: Carroll, Rhee, and Rhee (1994, 1999) examine the saving and borrowing behaviour of immigrants from different countries of origin in country-specific surveys, finding that behaviour does not seem to be significantly affected by ethnic and cultural origin or, to the extent that statistically significant effects can be detected, that the pattern of ‘origin’ dummies does not conform to country-of-origin aggregate savings patterns.

Aggregate and individual saving and borrowing patterns depend not only on cultural characteristics, but also on institutional and market characteristics. Documenting a large variety of aspects of household behaviour, and a similarly large variety of environmental features determining its constrained optimality, can allow researchers to estimate subtle effects and obtain valuable insights into welfare determination and policy choices. Within each country, policy variation can be used to obtain insights of hopefully general relevance about human objectives and interactions. The much larger variability of circumstances across countries can potentially, if appropriately documented and with suitable controls for other heterogeneity, yield stronger and more easily generalisable insights.

As changes in underlying frictions and institutions changes behaviour at the micro level, there are possibly important feedbacks at the macro level through changes in relative prices of the various asset and debt categories. While we abstract in our discussion from effects on prices, public finances, or general equilibrium, it is important to bear such effects in mind when making international comparisons involving several countries. For our purposes we consider it more important to have a closer look at the relevant characteristics of the various liabilities.

3. Characteristics of debt instruments

In some respects, portfolio considerations of households are similar to those of firms, banks, and the government. The pattern of cash outlays has different maturity across different assets and liabilities. And just like the portfolios of banks and other corporations, the portfolios of households are leveraged: it is sensible for households to simultaneously hold assets and liabilities as long as their maturities and rates of return are different (for intrinsic or tax reasons) in advantageous ways.

However, it has to be borne in mind that the portfolio of a typical household is peculiar in several ways. Most strikingly, household financial portfolios are not very diversified. The most important non-financial asset, human capital, is not marketed. Household assets pay dividends in terms of utility

when they take the form of durable goods in use (includes housing). Less obviously, the portfolio of a household also pays dividends in terms of utility when trading in assets and liabilities makes it possible to stabilize nondurable consumption in the face of income fluctuations. And the leverage characteristics of household portfolios are not as easily explained as those of financial institutions' portfolios. 'Oddities' in financial behaviour have been observed and documented, and occasionally been attributed to not fully rational expectation formation (Ausubel, 1991).

Among the characteristics of standard household debt instruments, the following may be worth singling out and discussing:

i. Availability: rationing is widespread, sometimes to zero, sometimes to a specific amount as in the case of credit card limits and of bank account lines of credit. Specific aspects of less than complete availability pertain to

a) *Access (transaction) costs*, such as cadastral registration and notary fees for mortgages, administration fees for instalment credit and annual fees for credit cards. Convenience costs may also be subsumed under transactions costs—they are the opportunity cost of having to apply for new credit with every credit-financed purchase to be made. Such costs are particularly low for revolving credit, even more so when fungibility is high (as is the case with credit cards issued on universal networks). Documenting such aspects empirically, and accounting for them theoretically, can explain the prevalence of zeros in specific debt categories: overall debt can of course be zero when assets are positive, and 'zero' is an especially likely value for total wealth when borrowing is possible but only at an interest rate higher than that paid by assets (see Carroll, 2001). Differences in access and transaction costs across liability types can also explain why a household's debt may be concentrated in a specific category.

b) *Information:* Debt 'zeros' in a specific category may also be explained by lack of awareness that such instruments would in principle be available without cost. Both monetary (or convenience) transaction costs, and informational awareness are perhaps even more relevant on the liability than on the asset side (on the latter, see Guiso, Haliassos, and Jappelli, 2003). Processing fees can be a substantial fraction of the cost, to supplier and customer, of extending small instalment credit. Economies of scale, such as may be afforded through repeated credit to an individual consumer (or, in the case of credit bureaus, to many similar consumers) can play an important role. And intensive advertising by consumer debt suppliers indicates that awareness is perceived by the industry as an important obstacle to debt issuance. Moreover, point-of-sale presence is important in extending intermediated consumer credit: in earlier times, shopkeepers supplied some of the credit (e.g., 'store cards') now processed by

banks and other specialized lenders (Calder, 1999) who to this day still cooperate closely with retailers.

ii. Maturity and liquidity: The timing of credit demand and debt repayment is very flexible for e.g. credit card balances. Other types of debt are due at specific times and the loan term is a defining contract parameter. Early repayment or refinancing may then be subject to substantial fees (see Table 2 for housing mortgages). Instalment loan repayment is due at prespecified intervals, which may or may not be a subject of choice by households. While the timing of repayment would be ill-defined and immaterial if borrowing were unconstrained, liquidity matters in the presence of realistic constraints. Attanasio (1995) stresses the importance of cash outlays for liquidity-constrained consumers, who are prepared to pay higher interest rates in exchange for longer loan duration.

iii. Interest cost: Rates of return on household liabilities are of course larger than rates of returns on household assets. The wedge reflects intermediation costs and/or agency considerations (asymmetric information, Stiglitz and Weiss, 1981). Moreover, the interest rate is not the same for different debt instruments. Some of this heterogeneity reflects administration costs. Some, however, reflects repayment risk: a high risk of non-repayment may in fact be an advantage from the debtor's point of view, in that the ability to default can include interesting contingent-asset characteristics in debt instruments.

iv. Risk: The nominal constancy of debt does not imply it is riskless for the borrower (on risk for the lender: see the point on enforceability below). Two types of risks are typically relevant: interest rate risk and inflation risk. Both will to a large extent be determined by the holding period or the maturity of the debt contract. The reaction of households for a given specific risk of a liability depends on preferences (risk aversion or prudence) and on hedging possibilities, (Campbell and Cocco, 2003), but also on the presence of other, uncorrelated background risk (Kimball, 1993).

v. Enforceability of repayment obligations: Delinquency (defined as temporary and possibly partial non-repayment of contractual obligations) is common in credit contracts, defaulting on debt (i.e., definite non-repayment or discontinuing debt servicing) is however a less common event. Different types of debt carry more or less severe penalties for non-repayment within a given legal system, conditional on the lender taking action. In some countries, but not in others, final termination repayment to all lenders may result in personal bankruptcy or debt restructuring plans with partial discharge of outstanding debt. From a researcher's point of view these characteristics are important because personal bankruptcy, when legally allowed, can allow a household to buffer negative earnings or life-history shocks (Grant and Koeniger, 2004). Also of considerable importance to lenders is the possibility of

early repayment, such that no interest accrues (“dormancy risk,” see Carling, Jacobson and Roszbach, 2001). Penalty fees are often in place for fixed-term debt contracts. On the supply side, of course, the amounts and/or interest rates must be less favourable to consumers when bankruptcy is allowed and not too costly. Some personal, mortgage, and instalment loans are covered by insurance clauses for contingencies such as serious illness or job loss: such insurance, which of course entails payment of a premium, decouples the lender’s and borrower’s non-repayment risk, which bears on a third party. Information sharing among credit suppliers can effectively discipline borrowers by threat of removed access to future credit (see Jappelli and Pagano, 2006). This makes the demand for credit path dependent.

vi. Tax treatment: Different asset and liabilities are taxed differently, having implications for the portfolio structure of households that are difficult to characterise due to complex interactions with economic choices and circumstances (see Poterba (2002a,b) for surveys). Here, the taxation of capital gains on assets that appreciate at different rates is particularly important—it matters a lot whether such capital gains are taxed as they accrue, when they are realised, or possibly not at all. While the same tax system typically applies for all households at a given point in time, the determination of after-tax returns on assets through the marginal income tax rate of the investor makes the relevant interest rates person- or household-specific. An additional consideration is that the consultation of professional tax advisors, who may be able to optimise after-tax portfolios given the tax system, is more likely by wealthier investors. These aspects apply to both assets and liabilities alike. Tax reforms, in addition, change investment incentives substantially over time. This can have tremendous repercussions also for the structure of household debt (Engen and Gale, 1996, 1997, Maki 2001).

What is more, financial instruments are often being designed in response to tax incentives and changes thereof. Most noticeably, mortgages as the largest household debt category are interweaved with other asset and insurance products such as to yield attractive after-tax returns to the average household at low access cost. The implication is, then, that a household is led to restructure his entire portfolio by holding such a composite financial product. Box 1 illustrates this for the Netherlands. Also see Leece (2000) for the UK.

4. Categories of household debt

Unlike income and (to some extent) assets, the most important categorisation of debt pertains to its nature (inasmuch as it bears on the characteristics listed above) rather than to the identity of the reference person within the household. We attempt a rough classification, indicating potentially relevant features worth eliciting from respondents.

4.1 General and core categories

We list here a number of categories that are presumably relevant in most countries, and where most coordination and data harmonisation effort—if appropriate—should focus on. They make up the largest items in a typical household’s debt portfolio. Other, perhaps less relevant, or very country-specific items are listed in section 4.2.

i. Revolving credit and credit card balances: Revolving credit types have in common that they do not specify the actual amount lent to the borrower, but rather set a maximum limit. The discretion of using the limit is left to the borrower, which in principle makes monitoring of usage necessary and costly, as the outstanding balance is not secured. Checking account overdrafts may also be subsumed in this category. Credit cards, as another particular form, also provide payment services. This makes it important to distinguish user types, as credit card ownership does not tell anything as such on whether the credit facility is actually used. Cards usage by convenience users for transaction purposes will for instance not react to changes in interest rates, but may well respond to changes in other, non-interest characteristics of the card (such as annual fee, length of grace period or other packaged amenities like insurances and frequent flyer points), see Brito and Hartley (1995). For revolvers, a (relatively high) interest rate is charged on outstanding balances and its variation may well lead to behavioural responses from such people (Ausubel, 1999). Maturity is poorly defined (by the minimum payment due), and indefinite; additional credit can be obtained easily up to the card’s limit, which in turn may be negotiable with the issuer (Gross and Souleles 2002a). For empirical usefulness, it is therefore important to not only establish ownership of a credit card but also its actual use and purpose. It has proved helpful in existing work to assess in how many months of a year the card carried a balance beyond the grace period (after the monthly payment made), and what an average balance would be in a typical month. The strong seasonality of balances (around shopping periods, e.g. Christmas) requires consistency in data collection across time and space. It is also useful to elicit if there is more than one user of a card held by a household, or if there are several card holders associated with the same account, as spending patterns may be determined by intrahousehold relations between users/card holders (Bertaut and Haliassos, 2002). In addition, note that there are particular institutional features that differ across countries even for cards belonging to the same international network (say, VISA or MasterCard). In many European countries (unlike in the US) it is customary that card issuing banks charge the outstanding balance directly and automatically to a linked checking account at the end of the grace period, without the consumer having to actively write checks etc.; that is, to effectively use the credit facility, one first needs to run the checking account balance to zero.

ii. Personal loans, not linked to a specific purchase or asset, are widespread. The typical idea of such contracts is to lend a specified amount at a specified fixed interest rate with

specified maturity and prescribe a precise repayment pattern. This specificity in contracts triggers low monitoring costs. Yet, the costs at application are potentially high, as the loan is not secured. Therefore, the interest rate charged is often higher than with instalment credit of similar size. Also, personal loans are often rationed according to assessment of repayment willingness and ability, and have shorter maturity than other forms of credit. The amounts involved may however be substantial. Contract parameters, since they are easily defined, may as well be solicited from respondents.

iii. Instalment credit. Consumer credit is generally cheaper when explicitly tied to the purchase of a good or service than in the case of a general personal consumption loan. In case of small-ticket items this is not due to the possibility of repossession (which is expensive for the lender), but rather because borrowing in order to purchase items with low second-hand value is only sensible if the item is actually used. Hence, lenders need not worry about borrowers gambling away the loan, and purchase of household appliances may be a better indicator of the consumers' unobservable inclination to repay than purchases of goods that are more likely to be correlated with recklessness and non-repayment inclinations (say, fast motorcycles or guns). For empirical research, it can be helpful to track the type of good that has been bought with the loan. Moreover, "zero" annual percentage rates credit, as widely advertised by car dealers and department stores, are only possible when retailers choose to bear the financial cost of their customers' borrowing. Essentially, dealers charge different prices to 'cash' and 'credit' customers, a behaviour that is most readily explained by price discrimination incentives (Bertola, Hochguertel, and Koeniger, 2005).

iv. Mortgages and other collateralized debt: mortgages are chiefly signed for housing purchases or real estate and occasionally for purchase of big-ticket items with non-trivial resale value, such as cars (also see: leasing in Section 4.2). Interest rates are low if repossession is possible and not too costly; typically, interest rates are flexible or fixed over certain time intervals. Length of periods of fixed interest rates is an important institutional feature that varies across countries and over time. Likewise, municipal insurance against repayment default is sometimes offered; again, this is a country-specific aspect. A mortgage's maturity depends on the item's useful life, but also varies considerably across countries. Mortgages tend to be fully collateralised. Lenders typically impose two types of constraints on the loan: first, they will restrict the size according to an assessment of the applicant's repayment capacity (mortgage qualification constraint expressed as a maximum permitted loan-to-income ratio), and secondly, they will demand a down payment from the borrower up front, such as to commit a stake into the asset. Note that required down payment ratios vary considerably across countries. Occasionally, loan-to-value ratios can exceed 100%, such as in the UK or the Netherlands, where these exceptionally high loans have been channelled in the

past into nondurable consumption or into buying leveraged stock portfolios. Table 3 illustrates some of the cross-country heterogeneity.

v. Educational loans, alimony payments, and other forms of government sponsored/regulated credit. Government guarantees can make it easier to obtain credit inasmuch they increase repayment probability from the lender's point of view. Whether repayment by the borrower is more likely depends on institutional details, in particular on whether government involvement implies tighter enforcement of debt obligations (e.g. by making it possible to seize the debtor's income) or simply payment by the government as a third party in case of default. Note, that government study loans often entail tax or interest advantages by design, since they are aimed at attaining certain policy goals (positive externalities of education, overcoming borrowing constraints, redistribution etc.).

4.2 Special and fringe categories

Here, we report on credit facilities that are more prevalent in some countries than in others, and we also list a couple of categories that are not strictly speaking credit (based on formal contractual agreements) but that belong into the relevant fringe of a household's debt portfolio as they constitute substitutes to the core instruments listed above.

i. Debt guaranteed by wages or non-housing assets: in some countries with highly secure employment opportunities, individuals can pledge a fraction of their wages (up to a fifth in Italy) towards repayment of a personal loan. Of course, this opportunity is only open to workers with secure jobs, such as civil servants. The interest rate charged on the loans is relatively low, since lenders can obtain payments from the employer directly. As with mortgages, such loans establish linkages between consumer's activities on both financial and labour markets, although it seems unlikely that offering access to such facilities induces labour supply or impacts on occupational choice. In some countries, it has become possible to secure a loan with financial assets such as shares or with life insurances. Conceptually, these arrangements resemble mortgages, except for their lower transactions costs.

ii. Informal arrangements (money borrowed from relatives or friends): Such possibilities are open for households in any country; their prevalence will depend much on access to and pricing in formal lending markets but also on cultural factors. The contract may or may not be formally settled. Lending to one's nearest kin may offer particular advantages over bank lending to customers in terms of monitoring and bonding possibilities and discipline the borrower (similar to group lending arrangements such as microcredit). This may reduce interest and red-lining in the informal market, but carries additional disadvantages with it: funds of the lender will often be limited and administration of such loans may be very costly

to both parties of the transaction. In addition, stigma effects may be particularly large for borrowers. It may be noted that money borrowed from family members may not always be cleanly separable from intergenerational transfers.

iii. Leasing and hire purchase: Technically, a lease is a rental rather than a credit facility. It belongs to the relevant fringe as it enables consumption and expenditure synchronisation, and hence is conceptually related to the intertemporal smoothing facility afforded by formal credit. One might therefore expect it to be a close substitute to a secured credit, such as a car loan. Empirically, auto leasing by private households has seen large growth rates in the United States in the 1990's, and substitution patterns with cash purchases and car loans have been explored in Mannering, Winston and Starkey (2002). Various forms of leasing exist, and in some contracts there is an explicit intent of transferring to ownership at the end of the lease against the residual value of the durable (this is sometimes called hire purchase or financial lease); in some contracts this feature is an option at the discretion of the lessee (operational lease); there are also contracts where the lessee never becomes the owner. One important institutional difference with credit contracts is that ownership rights reside with the lessor during the time of the lease. Hence, leasing is not always subsumed under credit regulations, and formally, no interest is being paid. Issues of payment enforceability arise as in the rental market for houses (on this: also see arrears, below), although they are comparable to those of collateralised loans. While the analogy with renting of homes is self-evident, similarities of economic implications may be limited: Hendel and Lizzeri (2002) document a higher average quality of off-lease second-hand cars compared to preowned ones, and model incentives provided by the option to buy which is effectively controlled by the option price set by the manufacturer. Under specific circumstances, leasing can reduce adverse selection.

iv. Arrears, in general, are contractual obligations to pay that are not honoured in a timely manner. There does not have to be an underlying credit contract, though. Some authors include repayment delinquencies on credit contracts in the definition of arrears. In any case, the debtor decides unilaterally not to meet his obligations. Non-credit arrears by households are presumably empirically not very important, although there are similarities with trade credits (on which: see Petersen and Rajan, 1997) that remain unpaid by the target date of payment. One might expect strong correlations with business cycles in both cases. Yet, for household arrears occurring on gas, water and electricity bills, effective enforcement mechanisms do exist (threat of termination of services). This may be different for arrears on housing rents where eviction is a costly process for the landlord (see Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003) who document cross-country variability in formalism

and efficiency of judicial procedures).² Missing regular payments on bills and rents may or may not be registered with credit bureaus, depending on countries.

v. Other: Any effort of assessing the overall level of indebtedness of a household is necessarily incomplete without a definitional “catch-all” residual. There are scores of credit arrangements that are theoretically possible and have not been covered in the above (from borrowing from loan sharks, and pawn broking on one end of the spectrum to highly sophisticated financial products on the other end). In particular in survey questionnaires, much of the information provided depends on the interpretation given by the respondent as well as his willingness to disclose detail, and a residual category offers the opportunity of filling in any gaps. Note, however, that collectors of longitudinal data should be aware of both institutional changes and changes in financial technology and in demand. Data structuring needs to be able to accommodate such changes, if they become relevant.

5. Measurement Issues and Data Sources

The above considerations highlight the desirability of disaggregating household liabilities along sensible and research-relevant dimensions, rather than just tracking their total size and subtracting them from assets.

The general point is that to the extent that household assets and liabilities are not traded in organized markets, and debt is rationed, their returns and maturities are heterogeneous in complex enough ways to make construction of an aggregate debt (or wealth) statistic conceptually difficult. Ideally, since debt instruments are heterogeneous in interesting and partly unobserved ways, it would be desirable to track them separately, document their institutional and market characteristics, and assess their relative price (in utility terms) on the basis of theoretical considerations. Given the various possible interactions of the demand for particular debt instruments, partly derived from underlying demand for durable and nondurable consumption, one may want to note that observing household liability components in isolation is also not sufficient for many purposes, as indivisibilities and binding constraints trigger important nonlinear spillover effects on the demand for other asset and debt components (see Jones (1993) for mortgage and nonmortgage debt, or Fratantoni (1998) and Hochguertel and van Soest (2001) for financial and housing worth).

A large variety of observable characteristics are relevant to demand and supply of household credit. On the supply side, credit availability depends importantly on the supplier’s attempt to assess motives and repayment likelihood, which in turn are related to the reasons for credit access. Information on occupation and income variability, and on household composition, is highly relevant to both the household’s motivation for borrowing and the lenders’ inclination to extend credit. Besides affecting

² Bridges, Disney, and Henley (2006) includes a detailed analysis of housing arrears in Britain.

the overall ‘precautionary’ behaviour of net wealth, income risk may also influence the composition of a household’s assets and liabilities: background risk makes it desirable to hold assets whose net future cash flows are negatively correlated with uninsurable shocks (Guiso, Jappelli and Terlizzese (1996), Hochguertel (2003)).

In practice, of course, detailed information is not as readily available as researchers would wish. We next consider possible advantages and disadvantages of different data sources in light of the above.

5.1 Administrative data

Some researchers have recently gained access to records from credit suppliers (banks) or credit bureaus. Such data can offer information as to whether debt is denied and whether it is repaid, and they do offer precise information as to the amounts of credit issued, reducing problems of measurement error that typically trouble survey data. The data contain in most cases the relevant information that the supplier needs in order to approve or reject the application. Customer databases contain millions of observations, and even a small random sample will be quite large. As an additional advantage, therefore, the cross-sectional size of such data often permits making very accurate statistical inference. Generally, such data can also be very precise about actual behaviour of debtors, especially when they track credit histories and repayment behaviour. To the extent that such data are not only a cross-sectional snapshot, they may also offer extensive possibilities for studying the dynamics of credit demand and supply.

We shall in the following briefly refer to selected work based on such data. Each of these data sets will have their own idiosyncrasies, though, and may be more suitable for some purposes than for others. In addition, typically the data contain highly confidential information, necessitating exclusive user agreements with the authors of the mentioned papers without being available to outsiders. It is, in addition, customary to mask the identity of the data supplier.

Ausubel (1999) for instance, has access to cross-sectional data from a major US credit card issuer. The database has been used for market experiments. That is, the credit card issuer wants to figure out how people select into using cards when parameters of the contract (such as introductory “teaser” interest rates and the length of the teaser period) are varied in a controlled fashion. An address database of individuals is screened against information from credit bureau files, resulting in mailing out ‘pre-approved’ credit cards to creditworthy individuals. Those people that return a signed application form will then be screened again on the basis of their actual, self-reported income statements—that is, there does exist the possibility of rejecting even ‘pre-approved’ cards. The information available to the author therefore contains all the scoring-relevant information that the supplier uses, and simply comparing the characteristics between people that do and do not react to the credit card offer will tell which of these groups represents on average higher credit risks. Ausubel (1999) finds, entirely as

predicted by theory, that those that accept the offer are both ex ante (at the time of initial scoring) and ex post (after having used the card for some time) riskier.

Gross and Souleles (2002a,b) use similar data from several different American issuers that contain comparable information. This has the advantage of not having to rely on information from a single firm which may not represent the market adequately. The second major difference to Ausubel's data is that their data is a panel with repeated measurements of the same account; that is, they observe payment and changes in contract parameters as they are being made. In Gross and Souleles (2002b) the authors try to disentangle a demand from a supply effect, on the background of observing increasing incidence of credit card delinquency during a period of stable economic growth. There are two competing explanations: increased competition in the industry may have caused issuers to accept credit risks that they may not have accepted earlier, such that the deterioration in the quality of the customer pool has essentially caused an increase in default probabilities (supply or 'risk effect'), or, changes in consumer attitudes (decreasing 'stigma' of bankruptcy) may have caused the increase in delinquencies, unaffected by supply side reactions ('demand effect'). Estimating dynamic models of credit behaviour, the authors do not find support for the risk effect, and interpret the remaining changes as being consistent with the stigma hypothesis. In Gross and Souleles (2002a), the authors use the same data and measure credit card spending behaviour (as assessed by usage of the credit line) in reaction to changes in the credit card limit. They find an average 'marginal propensity to consume out of liquidity' of about 10 to 14 percent, which gives support for the notion of liquidity constraints being relevant for the pool of credit card holders. This measure is again much larger for people that are already close to their limits to begin with. The authors are also able to estimate a parameter of interest to monetary policy, the long-run interest rate elasticity of the demand for credit. The preferred estimate is -1.3 , indicating substantial reaction of card holders to changes in interest rate (Ausubel (1991) had documented stickiness of interest rates previously and assumed that card holders would hardly react to the rate).

Alessie, Hochguertel and Weber (2005) study data from the leading Italian supplier of consumer credit. That data set is essentially a snapshot, but includes information relevant to a span of several years. It is the only one among the mentioned data sets that, while proprietary, can be accessible under some conditions to other interested researchers. The ultimate goal of the Alessie, Hochguertel and Weber paper is to get an estimate of the interest rate elasticity of demand for credit, and they exploit institutional changes and features of the data to tell demand from supply changes. The exogenous change is the introduction of a usury law halfway in the sample period, imposing limits on interest rates that suppliers can charge. An important institutional feature is that these limits change over time and differ by amount and by type of credit (revolving v instalment). The authors argue that the usury law has had differential impacts across types of credit on the supply side, whereas a uniform impact on demand (if any) can be expected. Essentially, calculating the difference over time of the difference

across credit types of interest rates charged will then identify the relation between interest rate levels and demand for consumer credit, and hence the interest rate elasticity of demand.

The key finding is that credit demand is interest rate elastic, with values close to those found by Gross and Souleles. This behavioural response may explain why the consumer credit industry has been traditionally reluctant to give its interest rates adequate publicity. A higher demand elasticity (at the median) in the affluent North (where there is more competition in the credit card market) than in Central or Southern Italy is also reported.³

5.2 Survey data

While the use of administrative data offers unique possibilities of studying some core economic phenomena with much statistical precision, they miss a part of the picture. First, the data sets do not offer but a handful of characteristics about the applicant and his or her personal circumstances (scoring-relevant characteristics from application forms). Second, there is no control about people that do not apply (either because they do not have a demand for the particular products, or they apply at different lenders, or they are discouraged from doing so), and in some cases, information on rejected applications is not available. To some limited extent, the data can be compared to characteristics of generally representative survey data, to assess, and possibly correct for changes in composition of the customer pool over time (see Gross and Souleles, 2002a, and Alessie, Hochguertel and Weber, 2005). The third aspect that existing administrative data are missing is the complete balance sheet of individuals, and thus a reliable measure of (household) net worth. If anything, credit scoring databases may contain the level of outstanding debt held elsewhere, whereas assets remain unobserved.

Whether collected for research or official statistical purposes, survey data offer a variety of additional, very interesting covariates. Examples of data sets in widespread use are the US Survey of Consumer Finances (SCF)—a triennial repeated cross section, the Italian Survey of Household Income and Wealth (SHIW)—a biennial repeated cross section with a limited panel component, and the Dutch DNB Household Survey (DHS)—a panel data set at annual frequency. Next to these exist three annual panel data sets that focus on incomes and labour supply rather than on wealth, with occasional interspersed cross sections containing asset and liability information: the US Panel Study of Income Dynamics (PSID), the German Socio Economic Panel (GSOEP) and the British Household Panel Study (BHPS). Occasionally, also use is made of consumption diary data that are available as short rotating panels or series of cross sections but that are often not very informative on the household asset

³ Many other administrative data have been used. For instance, Carling, Jacobson and Roszbach (2001) use administrative data from about 5,000 revolving credit accounts at a Swedish retailer. Accounts are followed through time, conditional on having been approved. The paper deals with the bank's risk of dormancy, i.e. consumers repaying before interest accrues. The authors estimate, using duration models of credit use, that this risk is financially more important for banks than default risks. Roszbach (2004) uses a larger sample of the same data (including rejected applicants) and studies credit supply issues.

and debt portfolio (US Consumer Expenditure Survey, CEX, or the British Family Expenditure Survey, FES). Most empirical work has been conducted on the US SCF and PSID, though. See Crook (2005) for more details and references.

In all these data, personal characteristics that matter for demand and availability of credit are polled. They can have indicators of reasons why households do or do not borrow. In particular, as in SHIW, SCF or DHS, respondents have been asked whether they have been denied credit, and whether they think they could obtain credit if they applied (thereby identifying discouraged borrowers; Jappelli 1990). Survey questions can also elicit subjective information: inclinations to borrow, reasons for borrowing, and relevant preference parameters (such as risk aversion or time preference) or expectations.

Appropriately structured surveys can offer powerful information to empirical researchers. In combination with consumption data, such as the relatively detailed measures of durable and nondurable consumption in the SHIW, subjective assessment of future expected income and income variability can be used as instruments to estimate utility curvature under the hypothesis that an unconstrained Euler equation governs conditional expectations of nondurable consumption growth—a hypothesis whose realism can in turn be checked using denied-credit indicators (see Bertola, Guiso and Pistaferri, 2005).

A weakness of survey data, however, may be precise measurement of amounts borrowed. It is conceptually difficult to define the current value of one's future repayment liabilities. In the case of mortgages, especially fixed-rate mortgages with or without early repayment options, calculations are complex and may entail judgement calls. Even in the case of instalment purchase plans the buyer's repayment obligations need not coincide with the purchased item's sticker price (Bertola, Hochguertel, Koeniger, 2005). These considerations suggest that qualitative indicators (or qualitative statistical procedures) may be better than attempting precise measurement of household debt amounts for different categories. However, it should be noted that similar considerations are applicable to the second-hand resale value of household durable assets, and that available information on such aspects in SHIW appears to be reliable enough as to yield theoretically meaningful statistical results (see Bertola, Guiso, Pistaferri, 2005).

Caveats on measurement issues notwithstanding, the last two decades have seen an explosion of research on household asset portfolios (see the volume by Guiso, Haliassos and Jappelli (2002) for references) and selected issues on debt holding (see the volume by Bertola, Disney and Grant (2006) for surveys of the literature) based on survey data. We shall refrain from summarising this work here, but mention a couple of interesting credit areas that have generated fruitful results.

Mortgages constitute the most well-researched subfield. The economic effects of mortgages are intricate, and empirical modelling has tried to tease out some of them. Much results from the development of the value of the underlying asset and hence on future price expectations. Increasing house prices can trigger a variety of responses, in particular from young owners or prospective future homeowners, depending on the design of institutional constraints (loan-to-income ratio and down payment requirements). Expected house price appreciations would typically raise down payment amounts and require greater saving efforts from renters that want to shift into ownership. Some of them will save more, others may adjust size or quality of the desired house, and others will give up (Engelhardt (1994) using Canadian data and Sheiner (1995) using the PSID; Engelhardt (1996) uses changes in food consumption in the PSID to test for liquidity constraints conditional on homeowner status). Others again will, when the qualification constraint becomes binding and mortgages need to be renewed (or, in the face of increasing interest payments) readjust their labour supply. Fortin (1995) found that Canadian women, whose husband is working full-time, are induced to work to service increasing mortgage payments after a new house has been bought.

Some papers look at holding patterns of credit card debt, giving rise to puzzling observations on household financial behaviour. In particular, many US households appear to simultaneously hold liquid assets and owe high-interest credit card balances, a behaviour that cannot be easily explained on the basis of purely financial considerations (Laibson, Repetto, and Tobacman 2003; Bertaut and Haliassos 2002 and 2006). Analysis of such issues based on existing administrative sources is precluded, since the asset side of an individual's balance sheet is not observed.

Lastly, the analysis of bankruptcy regulation and its implications for borrowing behaviour have been studied widely in the United States, see for instance Domowitz and Sartain (1999). The particular feature exploited by a number of papers is the cross-sectional variation in regulation across the 51 states. Households may shield some of their assets from sale and liquidation when filing for bankruptcy, and the extent of these exemption levels vary considerably by state. Fay, Hurst and White (2002) using the PSID, Gropp, Scholz and White (1997) using the SCF, and Grant (2003) with data from the CEX are noteworthy papers in this area.

5.3 Issues and Implications for Data Design and Collection

The preceding discussion has shown that household debt should be conceptually broken down into various credit instruments, such as to assess the entire debt portfolio. Due to common linkages with assets, the asset portfolio should where possible be covered in much depth as well. In addition, since the demand for credit and its composition is induced by underlying demand for durable and nondurable consumption, and since not only net worth constrains people's choices but also liquidity and short sale constraints, the timing of debt holding follows very complex patterns even in the simplest of economic models. Having access to data that in addition are informative on level,

development and composition of income and consumption would afford tremendous possibilities for economic research on household debt.

Currently, no such data exist, neither as cross sections, nor as panel data. Since each of the existing data has particular advantages compared to others, some researchers have been led to combine data sets from different sources using statistical procedures (Jappelli, Pischke and Souleles (1998) is an example, combining information from the PSID and the SCF).

A different issue, though, is that even if efforts were undertaken to sample new data with all the above considerations in mind, designing and collecting such data is a tremendous effort, not only on the side of the data supplier, but also on the part of the respondent. Surveying respondents on asset and wealth holding as such is difficult enough, because people need to be assured and convinced that their information will not fall into the hands of third parties with particular interests (say, tax authorities or commercial agents) and that their identity cannot be uncovered by anyone having access to the data. What is typically done is to remove any but the coarsest geographical information from the data. This is unfortunate for all those studies that rely on merging in variation in regional attributes to identify certain responses (for instance in the literature on mortgages where local house price information would be needed, or in the literature on bankruptcy exploiting regional variation in bankruptcy exemption levels).

A further, and presumably much more important consideration once respondents agree to participate, is the sheer amount of information that is requested from individuals during an interview. In particular, information on assets and debts, including all kinds of characteristics of particular portfolio components, is not readily available to the individual respondent but needs to be ascertained and looked up. The amount of information will depend on the structure of the portfolio. Considering that richer people have more diversified portfolios, respondents whose marginal value of interview time is highest need to answer more numerous and more complex questions. This is obviously a problem for data quality. It gets worse if in addition information on incomes and consumption, and possibly all kinds of other aspects is polled.

Probing information on (asset or) debt amounts may fail on another account: people may not recall precisely the value of liabilities or may not be willing to be precise. This often results in item nonresponse. Amounts can sometimes be successfully recovered to first approximation from follow-up questions of bracketed answers wherever respondents fail to be precise. Electronic questionnaires, as have been used during the last decade or so, offer additional possibilities of feedback and consistency checking during the interview, helping to minimise response errors. Additional aspects are discussed in Juster, Smith and Stafford (1999). In addition, since missing values aggregate in sums, non-response on wealth or debt items makes it necessary to apply imputation procedures in order to

measure net worth, a very important control variable. Some data sets, such as the SCF, are distributed including full imputation of amounts; other data sets may require higher user effort.⁴

Let us now turn to the question of what can be learned from use of administrative data for international comparative collection of survey data. We note two points. First, research of administrative data has shown that their particular features enable to address challenging questions. For instance, the sheer number of observation helps to pin down effects on low-probability events such as, for instance, bankruptcy (compare Gross and Souleles, 2002a, and Fay, Hurst and White, 2002). Hence, a large cross-sectional base should be strived for. Also, some of the administrative sources track credit histories or allow studying dynamics. Survey data can enable this to some extent if they are designed as panel data; however, frequency of observation is an issue (many consumer loans, especially of the instalment type, have very short durations). Lastly, measurement error should be minimised already at the stage of data collection.

The second point to note is that administrative data are already being used to a large extent by both users and providers of survey data since they contain valuable substitute or complementary information. For instance, administrative data are used for the purpose of checking accuracy of sampling and survey responses, or certain administrative information is merged into survey databases. For credit research, the latter might be quite useful, for instance, for cadastral records on mortgages and house values, or possibly to access credit bureau information.⁵ For this, unique identification numbers such as social security numbers or similar must be available with the data supplier (not necessarily revealed to the user). Domowitz and Sartain (1999) have combined administrative and survey data for their purposes. Statistical offices in some countries (especially Scandinavia) have decided to rely entirely on administrative data sources for labour market research, for instance. Notable in the present context is a data collection effort by Statistics Sweden on register-based wealth (and liability) micro data (“förmögenhetsstatistik”). Motivating reasons for switching to such data include high accuracy of data, large numbers of observation, low cost per record, and absence of attrition (except for death and emigration).

6. Conclusions

The increasing relevance and changing nature of consumer debt in many different countries makes it all the more important to collect and analyse internationally comparable data on household debt and on the characteristics of credit facilities. As this paper’s discussion makes clear, this is a complex and challenging task, with potentially very large (if risky) returns in terms of research output and

⁴ Note that the SCF comes with a series of alternative “implicates”, to facilitate multiple imputation techniques. Central distribution of such imputed replicates (as opposed to uncoordinated imputation by individual users) increases reproducibility of research.

⁵ Carling, Jacobson, and Roszbach (2001) have merged information from two administrative sources—from a lender on loans and from a credit bureau on scoring-relevant information—for the same individuals.

theoretical insights into individual choice and financial market mechanisms. While analysis of micro data drawn from dramatically different institutional and market environments can have far-reaching implications for macroeconomic and public finance policy, heterogeneous responses to environmental conditions are key to understanding the underlying mechanisms.

We have outlined conceptual economic issues and discussed aspects of measurement around household debt holding for such a data collection effort. Many complex issues are relevant to the interaction of demand for and supply of various credit instruments with each other, with asset holdings, with income and consumption, and in particular with institutional constraints imposed by the actual workings of financial markets and the tax system. While this paper cannot discuss these issues in detail, household debt should clearly not be measured in isolation: economic research can use debt information sensibly only in conjunction with information about assets, incomes, and consumption. Ideally, researchers would like to have a complete picture of the household debt portfolio, along with an extended description and measurement of the relevant characteristics of various debt instruments that are actually held by consumers.

Sufficient flexibility needs to be maintained, though, to account for country-specific idiosyncrasies of institutional settings. In particular, the incentives for asset and debt allocation within household portfolios are strongly shaped by, for instance, the differing tax codes of various countries, giving rise to quite different designs of credit instruments across countries. This becomes obvious by referring to mortgages and the tax treatment of mortgage interest payments. Relatedly, some of the most interesting empirical research done in the area to date actually results from being able to identify particular constraints and mechanisms relevant for household credit behaviour that would apply in one institutional setting, but not in others. Thus, in order for international comparability of data to be useful, relevant idiosyncrasies of particular institutional settings should be preserved and appropriately documented, with comprehensive definitions and descriptions of credit instruments in relation to institutional constraints, to guide the empirical researcher.

In addition, we can conclude from experiences made with administrative and survey data that data collection faces important trade-offs when trying to provide comprehensive coverage of credit instrument details. These trade-offs are induced mainly by privacy considerations, not only in a legal sense, but more importantly by the reaction of the surveyed individuals to the design of interviews and to publication of research based on their information. Administrative data are typically not collected for the purpose of economic research and the public (or a bank's clientele) might object because of matter of principle. Such potential conflicts of interest between researchers and both data providers and individuals need to be resolved by safeguarding non-identifiability of individuals and assurance that information not be passed on to third parties and cross-linked with other data. Survey data are susceptible to complete or item-specific nonresponse, and to panel attrition. Both are more likely when

more detailed questions are put to respondents. One general lesson that has been learned in developing survey instruments is that ownership or holding questions should be separated from information on amounts and from information on further contract characteristics. Yet, it remains important not to burden respondents with too many questions, since item-nonresponses aggregate to missing values in calculated sums. It will then be difficult to assess the overall level of debt holding of a particular household.

Returning to economic issues, and stating the obvious, debt holding is an intrinsically intertemporal phenomenon. It is therefore important, conceptually, to have access to panel data on household credit. They enable to study evolution of debt over time, without having to rely on identification of model parameters from cross-sectional variation. The latter is fraught with problems since not only dynamics will have to be ignored, but also selection effects arising out of heterogeneity in the population remain statistically indistinguishable from path-dependent behavioural responses. In addition, panel data can offer, if under restrictive assumptions, some hope for disentangling age patterns from cohort effects. Unfortunately, only very few such data sets exist to date.

In sum, documenting a large variety of aspects of household behaviour, and a similarly large variety of ‘environmental’ or institutional features, can allow researchers to estimate subtle effects and obtain valuable insights into welfare determination and policy choices. Within each country, policy variation can be used to obtain insights of hopefully general relevance about human objectives and interactions. The much larger variability of circumstances across countries can potentially, if appropriately documented and with suitable controls for other heterogeneity, yield much stronger insights and carry implications that can be generalised more easily.

References

- Alessie, Rob, Michael P. Devereux, and Guglielmo Weber (1997) "Intertemporal Consumption, Durables and Liquidity Constraints: A cohort analysis," *European Economic Review*, 41, 37-59.
- Alessie, Rob, Stefan Hochguertel, and Guglielmo Weber (2005): "Consumer Credit: Evidence from Italian Micro Data," *Journal of the European Economic Association*, 3, 144-178.
- Artle, Roland and Pravin Varaya (1978): "Homeownership and lifecycle consumption," *Journal of Economic Theory*, 18, 38-58.
- Attanasio, Orazio P. (1995): "The Intertemporal Allocation of Consumption: Theory and Evidence," *Carnegie-Rochester Conference Series on Public Policy*, 42, 39-89.
- Ausubel, Lawrence M. (1991): "The Failure of Competition in the Credit Card Market," *American Economic Review*, 81, 50-81.
- Ausubel, Lawrence M. (1999): "Adverse Selection in the Credit Card Market," mimeo, Department of Economics, University of Maryland.
- Bertaut, Carol C. and Michael Haliassos (2002). "Debt Revolvers for Self-Control", Federal Reserve Board, mimeo.
- Bertaut, Carol C. and Michael Haliassos (2006) "Credit Cards: Facts and Theories," Chapter 6 in Bertola, Disney and Grant (2006).
- Bertola, Giuseppe, Richard Disney, and Charles Grant, eds. (2006): *The Economics of Consumer Credit*. Cambridge MA: MIT Press.
- Bertola, Giuseppe, Luigi Guiso, and Luigi Pistaferri (2005) "Uncertainty and Dynamic Durable Adjustment," *Review of Economic Studies*, 72, 973-1007.
- Bertola, Giuseppe, Stefan Hochguertel, and Winfried Koeniger (2005), "Dealer Pricing of Consumer Credit," *International Economic Review*, 46, 1103-1142.
- Bridges, Sarah, Richard Disney, and Andrew Henley (2006) "Housing Wealth and the Accumulation of Financial Debt," Chapter 5 in Bertola, Disney and Grant (2006).
- Brito, Dagobert L. and Peter R. Hartley (1995): "Consumer Rationality and Credit Cards", *Journal of Political Economy*, 103, 400-33.
- Brugiavini, Agar and Guglielmo Weber (1994): "Durables and Non-durables Consumption: Evidence from Italian Household Data," in A. Ando, L. Guiso, and I. Visco (eds.), *Saving and the Accumulation of Wealth*. Cambridge: Cambridge University Press, 305-329.
- Calder, Lendol (1999) *Financing the American Dream: A Cultural History of Consumer Credit*, Princeton: Princeton University Press
- Campbell, John Y. and Joao F. Cocco (2003): "Household risk management and optimal mortgage choice," *Quarterly Journal of Economics*, 118, 1449-1494.
- Carling, Kenneth, Tor Jacobson and Kasper Roszbach (2001): "Dormancy risk and expected profits of consumer loans," *Journal of Banking and Finance*, 25, 717-739.
- Carroll, Christopher D. (2001) "A Theory of the Consumption Function, With and Without Liquidity Constraints" *Journal of Economic Perspectives* 15:3 Summer 2001, 23-45.
- Carroll, Christopher D., Byung-Kun Rhee, and Changyong Rhee (1994): "Are There Cultural Effects on Saving? Some Cross-Sectional Evidence," *Quarterly Journal of Economics*, 109, 685-700.
- Carroll, Christopher D., Byung-Kun Rhee, and Changyong Rhee (1999): "Does Cultural Origin Affect Saving Behavior? Evidence from Immigrants," *Economic Development and Cultural Change*, 48(1), pp. 33-50.

- Crook, Jonathan (2005): "The Measurement of Household Liabilities: Conceptual Issues and Practices," Luxembourg Wealth Study Perugia Meeting.
- Crook, Jonathan (2006): "The demand and supply of household debt: a cross country Comparison," Chapter 3 in Bertola, Disney, and Grant (2006).
- Deaton, Angus (1991): "Saving and Liquidity Constraints," *Econometrica*, 59, 1221–1248.
- Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2003): "Courts," *Quarterly Journal of Economics*, 118, 453-517.
- Domowitz, Ian and R. Sartain (1999): "Determinants of the Consumer Bankruptcy Decision", *Journal of Finance*, 54, 403-20.
- Engelhardt, Gary V. (1994): "House prices and the decision to save for down payment," *Journal of Urban Economics*, 36, 209-237.
- Engelhardt, Gary V. (1996): "Consumption down payments and liquidity constraints," *Journal of Money, Credit and Banking*, 28, 255-270.
- Engen, Eric M., and William G. Gale (1996): "Tax-Preferred Assets and Debt, and the Tax Reform Act of 1986: Some Implications for Fundamental Tax Reform," *National Tax Journal*, 49, 331-339.
- Engen, Eric M., and William G. Gale (1997): "Debt, Taxes, and the Effects of 401(k) Plans on Household Wealth Accumulation," Federal Reserve Board, mimeo.
- Fratantoni, Michael (1998): "Homeownership and investment in risky assets," *Journal of Urban Economics*, 44, 27-42.
- Fay, Scott, Erik Hurst, and Michelle J. White (2002): "The Household Bankruptcy Decision," *American Economic Review*, 92, 706-718.
- Fortin, Nicole M. (1995): "Allocation Inflexibilities, Female Labor Supply, and Housing Asset Accumulation: Are Women Working to Pay the Mortgage?" *Journal of Labor Economics*, 13, 524-557.
- Gollier, Christian (2002) "What does theory have to say about household portfolios?" Chapter 1 in Guiso, Haliassos, and Jappelli (2002).
- Grant, Charles (2003) "Evidence on the Effect of US Consumer Bankruptcy Exemptions," working paper.
- Grant, Charles, and Winfried Koeniger (2004) "Redistributive Taxation and Bankruptcy in US States," European University Institute, Finance and Consumption working paper.
- Gropp, Reint, Scholz, John Karl and Michelle J. White (1997): "Personal bankruptcy and credit supply and demand," *Quarterly Journal of Economics*, 112, 217-251.
- Gross, David B. and Nicholas S. Souleles (2002a). "Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data," *Quarterly Journal of Economics*, 117, 149-85.
- Gross, David B. and Nicholas S. Souleles (2002b). "An Empirical Analysis of Personal Bankruptcy and Delinquency," *Review of Financial Studies*, 15, 319-47.
- Guiso, Luigi, Tullio Jappelli, and Danielle Terlizzese (1996): "Income risk, borrowing constraints, and portfolio choice," *American Economic Review*, 86, 158-172.
- Guiso, Luigi, Michael Haliassos, and Tullio Jappelli, eds. (2002): *Household Portfolios*, Cambridge Mass: MIT Press.
- Guiso, Luigi, Michael Haliassos, and Tullio Jappelli (2003): "Household stockholding in Europe: where do we stand and where do we go?" *Economic Policy*, 123–170.

- Haliassos, Michael, and Alexander Michaelides (2002): "Calibration and Computation of Household Portfolios," pp.55-102 in Guiso, Haliassos, and Jappelli (2002).
- Hendel, Igal and Alessandro Lizzeri (2002): "The Role of Leasing under Adverse Selection," *Journal of Political Economy*, 110, 113-143.
- Hochguertel, Stefan (2003): "Precautionary Motives and Portfolio Decisions," *Journal of Applied Econometrics*, 18, 61-77.
- Hochguertel, Stefan and Arthur van Soest (2001): "The Relation between Financial and Housing Wealth: Evidence from Dutch Households," *Journal of Urban Economics*, 49, 374-403.
- Jappelli, Tullio (1990): "Who is credit constrained in the US economy?" *Quarterly Journal of Economics*, 105, 219-234.
- Jappelli, Tullio, Stephen Pischke, and Nicholas Souleles (1998): "Testing for Liquidity Constraints in Euler Equations with Complementary Data Sources," *Review of Economics and Statistics*, 80, 251-262.
- Jappelli, Tullio, and Marco Pagano (2006): "The Role and Effects of Credit Information Sharing," Chapter 10 in Bertola, Disney, and Grant (2006).
- Jentzsch, Nicola, and Amparo San José Riestra (2006): "Consumer Credit Markets in the US and Europe," Chapter 2 Bertola, Disney and Grant (2006).
- Jones, Lawrence D. (1993): "The demand for home mortgage debt," *Journal of Urban Economics* 33, 10-28.
- Juster, Thomas, James P. Smith and Frank Stafford (1999): "Measurement and structure of household wealth," *Labor Economics*, 6, 253-275.
- Juster, F. Thomas and Robert P. Shay (1964): "Consumer Sensitivity to Finance Rates: An Empirical and Analytical Investigation," NBER Occasional Paper No. 88.
- Kent, Christopher, Crystal Ossolinski, and Luke Willard (2007): "Household Indebtedness: Sustainability and Risk," paper presented at the Reserve Bank of Australia "Financial System: Structure and Resilience" conference, August.
- Kimball Miles S. (1993): "Standard risk aversion," *Econometrica*, 61, 589-611.
- Laibson, David, Andrea Repetto, and Jeremy Tobacman (2003): "A Debt Puzzle", in Philippe Aghion, Roman Frydman, Joseph Stiglitz, and Michael Woodford (Eds.), *Knowledge, Information, and Expectations in Modern Economics: In Honor of Edmund S. Phelps*. Princeton University Press.
- Leece, David (2000): "Choice of Mortgage Instrument, Liquidity Constraints and the Demand for Housing in the UK," *Applied Economics*, 32,1121-1132.
- Low, Simon, Matthew Sebag-Montefiore, and Achim Dübél (2003): "Study on the Financial Integration of European Mortgage Markets," European Mortgage Foundation and Mercer Oliver Wyman.
- Maki, Dean M. (2001): "Household Debt and the Tax Reform Act of 1986," *American Economic Review*, 91, 305-319.
- Mannering, Fred, Clifford Winston, and William Starkey (2002): "An exploratory analysis of automobile leasing by US households," *Journal of Urban Economics*, 52, 154-176.
- Mariger, Randall P. (1987): "A life-cycle consumption model with liquidity constraints: theory with empirical results," *Econometrica*, 55, 533-557.
- OECD (2004): *Economic Outlook*. Volume 2004/1, and Statistical Annex. No. 75. Paris: OECD.
- Petersen, M. A., and R. G. Rajan (1997): "Trade Credit: Theories and Evidence," *Review of Financial Studies*, 10, 661-691.

- Poterba, James M. (2002a): "Taxation and Portfolio Structure: Issues and Implications," in Guiso, Haliassos, and Jappelli (2002), 103-142.
- Poterba, James M. (2002b): "Taxation, Risk Taking, and Household Portfolio Behavior," in Alan Auerbach and Martin Feldstein (eds), *Handbook of Public Economics*, Vol. 3. Amsterdam: North-Holland, Chapter 17.
- Roszbach, Kasper (2004): "Bank lending policy, credit scoring and the survival of loans," *Review of Economics and Statistics*, 86, 946-958.
- Runkle, David (1991): "Liquidity Constraints and the Permanent Income Hypothesis: Evidence from Panel Data," *Journal of Monetary Economics*, 27, 73-98.
- Sheiner, Louise (1995): "House prices and the savings of renters," *Journal of Urban Economics*, 38, 94-125.
- Stiglitz, Joseph E. and Andrew Weiss (1981): "Credit rationing in markets with imperfect information," *American Economic Review*, 71, 393-410.
- Zeldes, Stephen (1989): "Consumption and Liquidity Constraints: An Empirical Investigation," *Journal of Political Economy*, 97, 305-346.

BOX 1: Mortgage instruments and tax incentives: Examples from the Netherlands

In this box, we provide a few examples of types of mortgages that exist and existed in the Netherlands, having implications for not only the household debt portfolio but also for asset holding, and consumption possibilities. Similar arrangements exist in other countries, but the Netherlands (along with the UK) do offer one of the broadest choices of products. Since their design is strongly induced by the tax system, the exact product specifications will differ across countries. In the Netherlands, a major income tax reform in 2001 has changed many of the incentives, as consumer credit interest is not tax-deductible anymore, and tax deductibility of mortgage interest payments from the income tax base has been limited to the principal residence. In 2004 and 2005, further loopholes have been fixed.

In terms of classification, two main groups of mortgages can be distinguished: those where a portion of each instalment repays the principal (repayment mortgages), and those where that is not the case (non-repayment mortgages). The first group can be subdivided in annuity and linear mortgages, the second into those where repayment is deferred until the end of the contract (endowment mortgage) and those where repayment is indeterminate. The latter can be subdivided into several subclasses (among which a 'credit mortgage' or home equity lines and an 'life insurance/annuity mortgage') while endowment mortgages link assets and insurances to the mortgages in order to deal with repaying the principal. Subclasses include an 'investment mortgage', a 'shares mortgage', a 'savings mortgage' and a 'life insurance mortgage').

I. Repayment Mortgages: Annuity and linear repayment mortgage:

The borrower repays a constant amount (annuity) during the entire loan period, or he repays a fixed part of the loan (linear) with decreasing monthly interest payments. Since interest payments are frontloaded, repayment mortgages will predominantly reflect interest in the beginning and loan repayment in the end. When interest payments are tax deductible, after-tax payments will be much lower in the beginning of the contract than in the end, hence the fiscal advantage decreases over time. Such products are attractive for people whose income is expected to fall, or whose impatience is high, but their relative attractiveness decreased in pre-reform years as rivaling products became available that exploited existing tax incentives to a larger extent.

II. Non-repayment Mortgages:

These are interest-only mortgages, that is, the lender only receives interest payments without repayment of the loan. Amortisation occurs either by way of a lump-sum payment or by contracting a new mortgage upon expiry of the old one. Monthly payments are low since only interest is paid, but total loan amounts are typically capped. There is no accumulation of home equity (except for possible capital gains). It is the borrower's responsibility to save enough for the lump-sum payment if the debt is to be redeemed.

II.A. Shares or investment endowment mortgage:

The savings vehicle chosen for building up the lump-sum that will be used to repay the debt are stocks or shares (possibly other liquid and risky financial instruments). Enticed by capital gains in the stock market during the 1990's, lenders were willing to lend large amounts, exceeding 130% of the value of the house. Both the recent bear market in 2000-2003 and the 2001 tax reform have made this type of product less popular. Dividends were effectively untaxed for many households until 2001. This also has changed since the income tax has been substituted with what is essentially a wealth tax (capital income is assumed to accrue at a constant virtual interest rate, and the virtual income is taxed at a flat rate).

II.B. Credit mortgage or home equity line:

This product specifies a 'credit limit' among the contract parameters. The loan contract resembles a revolving credit, except that it is collateralised with the house. While interest payments are encouraged, they need not necessarily occur. The credit limit can be quite flexibly used to acquire consumption goods other than the housing service flow, essentially like nonmortgage consumer credit. Since nonmortgage credit interest used to be tax deductible until 2001 as well, such constructs were quite attractive and popular. The 2001 tax system regards as relevant the actual use of a property as primary residential domicile, limiting the scope for interest deductibility. A flexible interest rate and a cap on the credit limit not exceeding the resale value of the house typically characterize this mortgage type.

II.C. Life insurance/annuity and savings mortgages:

Here, the mortgage loan is coupled with a life insurance that keeps paying an annuity until the day of death, or amortises the debt if the borrower dies before the contract expires. Since the tax system treated life insurances as tax-deferred accounts (premium paid not taxable, annuity received taxable), people could make use of tax-progressivity effects in old age. These fiscal advantages have also been reduced by the 2001 tax reform. Life insurance mortgages exist in various forms; the premium paid may be split in two: an insurance part and a savings part; the latter is used to build up equity, on which interest is paid tax-free (under certain conditions). Savings mortgages, as a special case, link the interest paid on the mortgage to the interest received on the savings made. Additional forms exist that allow investing in risky financial assets (breaking the interest-rate link).

Table 1: Household wealth and debt (end of period) in percent of disposable income

country		1992	1995	1998	2001	2002
France	Net wealth	510.4	507.7	578.0	616.1	605.6
	Non-financial assets	337.3	312.7	315.8	361.0	380.1
	Financial assets	253.4	262.9	336.0	336.7	308.4
	Liabilities	80.3	67.9	73.8	81.7	81.8
	Long-term loans	53.0	51.6	52.9	55.6	56.9
Germany	Net wealth	530.8	563.1	585.4	568.5	495.3
	Non-financial assets	341.4	360.6	360.3	340.4	340.3
	Financial assets	209.9	236.2	266.2	270.9	267.2
	Liabilities	85.7	100.6	111.0	112.0	112.1
	Mortgages	50.3	61.0	68.5	72.1	73.0
Italy	Net wealth	723.8	699.3	713.2	714.2	n.a.
	Non-financial assets	516.7	475.3	446.9	462.5	n.a.
	Financial assets	237.7	254.6	296.7	287.0	n.a.
	Liabilities	30.6	30.6	30.3	35.3	n.a.
	Medium and long-term loans	14.4	18.6	21.2	26.0	n.a.
United Kingdom	Net wealth	546.6	555.8	666.5	670.9	668.2
	Non-financial assets	312.5	270.2	313.0	364.1	426.6
	Financial assets	343.5	392.2	461.9	423.7	379.3
	Liabilities	109.4	106.6	108.5	116.8	128.9
	Mortgages	79.1	78.1	78.6	84.3	92.9
Canada	Net wealth	440.6	483.7	505.4	506.3	509.7
	Non-financial assets	245.6	258.0	265.0	268.7	277.8
	Financial assets	291.6	329.1	352.4	352.5	347.2
	Liabilities	96.7	103.4	112.0	114.9	115.3
	Mortgages	64.6	68.8	71.8	69.8	70.3
United States	Net wealth	482.1	510.7	584.0	552.7	506.1
	Non-financial assets	207.0	204.4	205.3	223.6	231.2
	Financial assets	362.2	400.2	477.2	437.2	387.0
	Liabilities	87.2	94.0	98.5	108.1	112.2
	Mortgages	62.3	63.7	66.5	74.0	79.1

Source: OECD (2004), Annex Table 58, Selected countries and years. Figures based on National Accounts Statistics. Households include non-profit organisations serving households.

Table 2: Characteristics of Selected Mortgage Markets in Europe

Country		Denmark	France	Germany	Italy	Netherlands	Portugal	Spain	United Kingdom
Average duration (term)*		30.0	17.0	23.0	14.8	30.0	27.0	20.0	25.0
Average expected holding period		7.0	9.5	15.7	14.4	7.5	19.1	13.3	6.2
N. months to register*		0.1	1.0	0.5	1.2	0.25	1.25	0.3	0.8
N. months to repossess*		6	12	12	60	5	18	9	12
Market share of fixed-rate mortgages		78.6%-85%	84.5%-95%	99.3%-100%	50.5%-66%	80%-93.5%	5%-9%	0.6-6%	17.7%-36%
Market share % of new lending 1999*	Variable rate < 1 year	20%	35%	0%	37%	20%	95%	0%	62%
	Initially fixed 1-5 years	0%	5%	20%	26%	6%	5%	93%	30%
	Initially fixed 5-10 years	0%	0%	70%	0%	14%	0%	1%	7%
	Initially fixed 10+ years	0%	0%	10%	0%	58%	0%	0%	1%
	Fixed to term	80%	35%	0%	37%	2%	0%	6%	0%
Restrictions & fees on prepayment / early repayment		Most fixed rate products prepayable without fee	Fees only on fixed rate products, capped at min(6 month interest, 3% capital repaid)	No fee on adjustable rate products	Legal regulation; in practice: 1-2% of capital repaid	National code of conduct: 10% prepayable without fee (in practice: 15%)	Usually, 2% fee of capital on repayments of over 25% of the exposure	Prepayment fee capped at 1% on variable rate products, 4% on fixed rate products	Early repayment fees on many fixed rate and discounted products

Source: Low, Sebag-Montefiore, and Dübel (2003), various tables and figures; rows marked (*) are approximate because data in source are presented in graphs only.

Table 3: Mortgage debt and time required and cost of mortgage enforcement procedures

Country	Residential mortgage debt/GDP (%)		Loan-to value ratio		Time required for execution of foreclosure	Administrative cost (%)
	1992	2002	typical	Maximum		
Austria	n.a.	n.a.	60	80	6	n.a.
Belgium	19.9	27.9	83	100	18	18.7
Denmark	63.9	74.3	80	80	6	n.a.
Finland	37.2	31.8	75	80	2-3	2.5
France	21.0	22.8	67	100	15-25	7
Germany	38.7	54.0	67	80	12	4.2
Italy	6.3	11.4	55	80	60-84	n.a.
Netherlands	40.0	78.8	90	115	6	3
Norway	47.9	50.2	n.a.	80		
Spain	11.9	32.3	70	100	7-9	17
Sweden	37.5	40.4	77	80	4-6	5
United Kingdom	55.5	64.3	69	110	8-12	2.6-7
Canada	42.7	43.1	75	n.a.		
United States	45.3	58.0	78	n.a.	8.4	11.7

Source: OECD (2004), Tables IV.3 and IV.5. Administrative cost based on property values of 100,000 Euro.

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