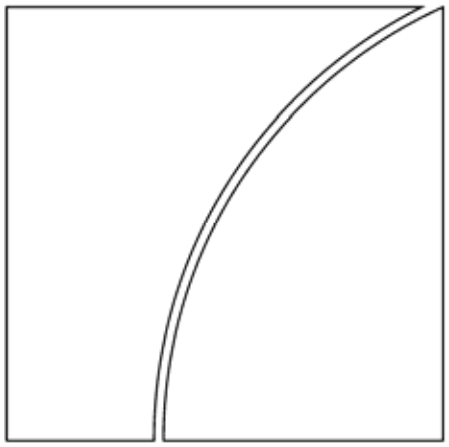
Irving Fisher Committee on Central Bank Statistics



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William White[1]

A. Introduction

As the Economic Adviser and Head of the Monetary and Economic Department of the BIS, let me begin by extending a warm welcome to all the participants at this conference, the third to be organised at the BIS under the auspices of the Irving Fisher Committee. Let me also thank the participants for attending, and the organisers for all the hard work they have put into making this conference as successful as its predecessors.

There are a number of reasons why I am pleased that the Irving Fisher Committee, which brings together central bank statisticians from around the globe, is now receiving secretariat support from the BIS. Perhaps the first reason is the importance of the work itself. Good policy can only be conducted on the basis of good analytical work, based in turn on good data. While good data may not be sufficient to ensure good policy, it must surely be necessary. A second reason for being pleased that the BIS can make a contribution in this area, is that it conforms entirely to the mission of the BIS to foster cooperation among central banks. The BIS has for many years collected cross-border financial statistics from central bank sources, and has in the process confronted many interesting methodological issues. Through this process we have succeeded in assembling databases, particularly creditor-based measures of external debt, that policymakers have found extremely useful. Nevertheless, our cooperation on issues of statistical methodology in other areas has been much less notable. Both this conference and the projected work program of the IFC are clearly aimed at rectifying that deficiency, thus providing further support to the difficult task of policymaking.

If I am generally pleased that you are here, I am particularly pleased at the choice of topic for this conference: “Measuring the financial position of the household sector”. This is an extremely important topic, since the behaviour of the household sector has conditioned, and will continue to condition, global growth prospects. Over the last few years, the household saving rate in many industrial counties has fallen sharply, with the lowest level of savings being recorded in the English-speaking countries. What seems to have had a big influence is increases in house prices, which in turn have led to perceptions of increased wealth and household spending. It is only a slight exaggeration to say that consumers in such countries, particularly the United States, have provided the primary impetus to global growth in GDP, which achieved record levels in both 2004 and 2005. It is important to understand why this occurred and the extent to which it will be sustained in the future. Having a better grasp of how the financial position of the household sector has evolved will help economists address these deeper questions.

It should be noted that it is not only the behaviour of the household sector in the industrial countries that is of interest. In many emerging market economies, especially in Asia, household saving rates have stayed resolutely high or even risen. In contrast to the industrial

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[1] Economic Adviser and Head of Monetary and Economic Department, Bank for International Settlements.

countries, where the focus of households has been on how assets are mounting, in some important emerging market economies the focus has rather been on liabilities, or at least contingent liabilities. China provides a good example. As the state has withdrawn from its earlier role of cradle to grave protection, people have come to realise they must save for housing, medical care, education and pensions. And at the same time as the public safety net has been withdrawn, the full implications of the "one child" policy are also becoming more apparent; the private safety net provided by the family has become seriously attenuated. It is important to know how such considerations might play out over time. An eventual decline in household saving rates in such countries might be a welcome development to complement increases in saving in key industrial countries, like the United States, thus fending off global recession. Conversely, were the former to occur without the latter, the end result might be a resurgence in global inflationary pressures which would have to be resisted through policy.

And finally, by way of underlining the importance of this topic, the disparity between household saving rates in different groups of countries is responsible in large part for global trade imbalances. In particular, fluctuations in the US household saving rate, around a steadily declining trend, almost perfectly match movements in the US current account deficit. While some people also point to the recent re-emergence of a fiscal deficit in the United States (the "twin deficits" problem), in fact this seems to be a relatively minor part of the problem. These imbalances could in the limit lead to a full-blown currency crisis, with feedback effects on a number of financial markets with what seem to be overstretched prices, or perhaps even more dangerously to a resurgence of protectionism. Evidently, having a better handle on how household behaviour might evolve could give welcome clues as to the need for policy interventions to try to avoid such problems. While today is not the time to go into what those policies might be, suffice it to say that this is an important area for discussion.

What is less clear is how the changing financial position of the household sector influences the willingness of consumers to spend on currently produced goods and services, thus influencing the big macro variables like GDP, inflation and unemployment. Two puzzling issues present themselves. The first is how "wealth" should properly be measured, and whether serious mistakes are now being made in this regard by consumers in many countries. The second is how changes in wealth, and indeed the underlying constellation of assets and liabilities, might affect consumption levels.

B. How should wealth and savings be measured?

Let me begin somewhat provocatively by saying that I agree with the recent statement by Bob Merton[2] that "even for measuring economic welfare, wealth is not a sufficient statistic What matters to people is not how much wealth they have, but the standard of living they can enjoy. The standard of living is much better represented as a lifetime flow or a perpetuity rather than as a stock of (measured) wealth".

Merton further supports his point by noting that those who save for retirement, for example, are influenced not only by the amount of wealth they have at a moment in time, but the rate of return at which that wealth might be expected to accumulate over time. We see practical applications of this insight when we hear baby boomers complain about recent low rates of interest. An implication of this insight is that changes in interest rates do not have any effect on this lifetime flow, in the same way that a purchase of a long-term bond provides a given yield, if held to maturity, regardless of what happens to interest rates in the interim. If interest

[2] See Merton (2006), p 62.

rates fall, you receive a capital gain, but this is offset by the lower rate of interest you will now earn on that larger stock of capital. Or, to put it another way, if interest rates fall, you need a greater initial source of wealth to generate the same income stream.

As a corollary, I also agree with M J Bailey, who stated much earlier[3] that this lifetime flow of produced goods and services depends on the production possibilities of the society and that "when no change at all has occurred in physical capital, land or labour or in their present or prospect productivities, no new productivity or wealth has appeared to make possible any increase in future consumption".

If these are the slowly changing sources of "real wealth", how then is it possible that "measured wealth", drawn from balance sheet statistics, can fluctuate as much as it does in our estimates? Similarly, how is it possible that estimates of wealth in a number of industrial countries have recently risen as much as they have?

One important part of the answer could be perceptions of increased productivity, and therefore increased future output to support future consumption. This was the story told in the United States in the late 1990s, as manifested in the higher prices of equities, particularly for "New Era" stocks in the media, technology and telecommunications sectors. At the level of principle, this would constitute wealth for Merton and Bailey, although at the level of practice we can now see that there was actually less there than met the eye.

But I think another important part of the answer is that we are much more accurate in measuring assets than in measuring liabilities, particularly contingent ones. Pensions, for example, while clearly "wealth" to individuals who are promised them, should properly be offset by the liabilities of those who have to pay out. Increases in house prices constitute "wealth" to those who own a house, but there is an associated liability in the form of the increased cost of housing services.

Viewed from this perspective, the suggestion that countries benefiting from large increases in measured wealth, largely because of asset price increases, need no longer save out of income in the traditional way looks not only questionable but dangerous. Saving associated with illusory wealth increases is illusory saving. The end result must be a lower level of domestically owned capital and an associated lower standard of living over time. Moreover, such spending can contribute to current account deficits, with all the associated potential for mischief noted above. And to this must be added the diminished political authority associated with countries that become increasingly indebted. History has many lessons to teach us in this regard.[4]

A closely related problem with the measurement of wealth has to do with the sectoral disaggregations we use in the integrated national income accounts. We treat the liabilities and assets of other sectors as counterparties to the liabilities and assets of the household sector, and as factors influencing household wealth. The assumption that government was "separate" also underpinned the distinction between "inside money" and "outside money" in Patinkin's well regarded macroeconomic textbook of the 1960s.[5] Following on Pigou's earlier insights, Patinkin showed how deflation would raise real wealth (essentially the liabilities of governments) such that spending would increase and the deflationary process brought to an end.

Yet, today, economists are more likely to refer to the "Ricardian equivalence" issue. This starts with the diametrically opposed assumption that the household sector can see through

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[3] See Bailey (1962), p 181.

[4] See Kennedy (1988) and Landes (1998).

[5] See Patinkin (1965).

the veil of government (and indeed of the corporation) and recognises that, in the end, domestic households and foreign sector are all there is. Government spending increases wealth in the form of increased government debt, but it is exactly offset by the future discounted value of the household's associated tax liabilities. My later remarks will indicate that I find this concept of "superrationality" on the part of households extremely far-fetched, but it is nonetheless interesting to reflect on how economists' assumptions can have implications for measurement issues.

What are we to make of all this when assessing how wealth affects consumer spending and the production associated with such spending? Perhaps the central point is that it is perceptions that drive the assessment of "wealth" and the future living standard it is thought to provide. Moreover, in the short or even the medium run these perceptions can differ widely from the underlying realities determined by an economy's productive capacities. In the following sections of this paper, I focus on the challenges these issues can pose for both monetary and fiscal policymakers. I finish with some reflections on associated challenges for statisticians.

C. House prices, real wealth and consumption

Over the last few years, we have witnessed an almost global phenomenon of low real interest rates, rapid increases in credit, rising prices for longer-term financial assets, sharply rising prices for such real assets as property and commodities, heavy physical investment in such sectors, and record high levels of global economic growth. Insofar as property in the industrial countries is concerned, only Japan, Germany and Switzerland have avoided sharply higher prices for residential property in recent years. This perhaps reflects the severity of the boom-bust cycle they experienced in the late 1980s and early 1990s, from which they are only now showing signs of recovery.

Today, I wish to investigate further the links between interest rates, house prices, wealth and consumption patterns, to determine the extent to which what we have recently observed might be thought more or less sustainable. In this evaluation, the distinction between real wealth and perceived/measured wealth is of crucial importance. A number of linkages can be looked at in turn. First, what is the presumed link between interest rates and house prices? Second, do higher house prices constitute an increase in aggregate wealth? And third, how might lower interest rates and higher wealth affect consumption?

Lower interest rates will increase the demand for all longer-lived assets of similar duration and push up their prices. This applies to residential property as well as to financial and other real assets. However, without changes in the underlying productive potential of the economy, this implies an increase in measured wealth, or perceived wealth, but not a permanent increase in the underlying income stream ("real wealth"). The key point is that as house prices rise, the cost of housing services also rise. Indeed, if the cause of the decline in interest rates were a decline in the potential rate of growth in the economy, it could even be asserted that real wealth had fallen as measured wealth increased.

This said, homeowners are very likely to "feel" richer. Moreover, because there is now more collateral available up front, and monthly payments at lower interest rates now look more affordable, lenders will now find it easier to provide credit which will allow homeowners to borrow more to invest still more in housing. Should the past increase in house prices generate extrapolated expectations of still further increases, this can create a dynamic of higher house prices which, in the end, bears little relationship with the initial interest rate shock. Speculative price increases of this sort (separable from those associated with lower interest rates) also fail to increase the aggregate real wealth of the nation.

What is true is that some citizens (homeowners) will benefit at the expense of those that do not own property. Homeowners gain at the expense of others in that they have an offset to

the assumed higher future costs of housing services whereas renters do not. In perfectly functioning markets, house prices and rents would rise commensurately. In reality, rents often fail to keep up with the spiralling costs of houses.[6] Indeed, at the current moment, house price to rental ratios are at record highs in many countries. Whether house prices will eventually fall to establish a more normal relationship with rents, or whether rents will rise to the same end, will have distributional consequences (of which more below) but it in no way affects the reality that no aggregate real wealth has been created by these price changes.

The third issue is how lower interest rates and increased wealth might lower saving out of current income and increase spending. There was a long debate in the economic literature as to the effect of lower interest rates on saving. On the one hand, lower interest rates lower the price of current goods and services relative to future goods and services. Some argued that this would lead people to substitute current consumption for future consumption, leading to less saving. Others, however, argued that lower interest rates meant wealth would increase more slowly, and that people would have to save more to achieve a predefined target for accumulated wealth. Broadly put, the general conclusion this debate led to was that the result was indeterminate. However, in retrospect,[7] it is now clear that the latter approach implicitly assumed that interest rate changes do have wealth effects and that the final conclusion of indeterminacy reflects the joint influence of substitution and wealth effects. But since it was argued above that interest rate changes do not affect real wealth, it must then be concluded that the only channel through which interest rates affect consumption should be the substitution affect.

This is an important conclusion pertaining to consumption and saving levels looking forward. First, to the extent that recent exceptionally high levels of consumption in some countries have been driven by substitution effects, there is likely to be some form of payback required in terms of lower future consumption. This remains the basic reality, even if higher house prices and improved collateral have been welfare-enhancing through facilitating intertemporal substitution. Second, if consumption has risen in response to perceived wealth gains, while real wealth has remained unchanged, the magnitude of the consumption payback may be materially enhanced. Illusory saving will have to be reconstituted out of current disposable income, perhaps with significant effects on domestic economic activity.

The likelihood of increased house prices having “wealth” effects on consumption will be affected by the distributional effects of house price increases and by developments within the financial sector. Concerning the former, older house owners gain at the expense of largely younger renters. If the former choose to consume more in consequence, influenced in part by the intention to “trade down” after retirement, but the latter fail to consume less, then net consumption will rise.[8] Traditional econometric work in the United States, where wealth variables include the market value of housing, confirms that such a relationship is commonly observed.[9] Concerning the latter, some national financial markets not only allow, but even

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[6] In such circumstances, renters will actually lose less, but they are still likely to feel worse off because their higher costs of housing services are explicit, while those of the homeowner are implicit.

[7] See Bailey (1962), pp 178-82.

[8] A significant factor affecting the behaviour of older house owners is their concern about providing “bequests” to their descendants. An unencumbered house that lasts longer than those living in it can be given to those that follow. If, however, the house is remortgaged and the proceeds spent, then the bequest will be reduced accordingly. Different cultures may respond differently to such considerations, implying different consumption propensities as house prices increase.

[9] This raises the issue of why the econometrics fails to pick up the “payback“ in terms of lower consumption over time, in response to near-term increases in consumption driven by house price increases. Given the complexity of the lags involved, and the heterogeneity of the many agents, it might be that the econometric procedures have simply not been robust enough to do so.

encourage, homeowners to withdraw equity from their homes in the form of cash and higher mortgages. While some of this money may be used for the settlement of other debts, or the purchase of more housing-related services, the evidence indicates that a significant amount of such cash is used to increase consumption of other goods and services. How the excesses associated with such behaviour might unwind, and which economic agents might be affected, is discussed in the following section.

Finally, it is worth noting that a combination of low interest rates and higher house prices is also likely to generate a supply side response. In a number of countries, investment in residential construction has increased significantly, and there has been an equally marked increase in sectoral employment. While there is nothing wrong with this in principal, it can accentuate current account problems. Consider the United States, for example, with its massive current account deficit. As noted above, the lower household saving rate seems primarily responsible for this. In effect, domestic saving is inadequate to finance domestic investment. Were the higher level of investment directed to increasing the capacity to export, this deficit might be thought only a temporary phenomenon. In contrast, housing services are not internationally tradable (unless foreigners arrive in mass) and the sunk capital cannot be adapted for other purposes. Looking ahead, the external adjustment process will be more difficult in the light of the housing boom than it would otherwise have been.

D. House prices, debt and consumption

If higher house prices do induce an increase in spending, then the households that have done so finish with fewer assets or more liabilities than they would otherwise have had. In practice, debt levels have trended sharply higher in recent years as consumers have remortgaged their existing house at higher levels or have traded up. In spite of record low interest rates in recent years, debt service levels (as a proportion of disposable income) have also risen sharply and now stand at record levels in a number of industrial countries.

Should house prices fall, which is one way to re-establish a more normal ratio of house prices to rents, then the payback referred to earlier will be primarily at the expense of homeowners. It will then be evident that the wealth they spent was illusory; the assets have disappeared but the liabilities linger on. This would have negative implications for spending. However, even were prices only to stop rising, the growth rate of consumption would be affected due to the absence of the earlier stimulus of rising prices.

Rising interest rates on higher debt levels would have similar negative effects on consumption, with the magnitudes strongly affected by the terms of the debt service on the higher debt levels. It is a fact that, in recent years, there has been a strong shift in the direction of flexible rate mortgages and other provisions that shift the risk of unforeseen events on to the shoulders of households.[10] Indeed, it is clear that much of the new debt would never have been made available to borrowers under traditional lending arrangements. One unfortunate implication is that, in less supportive financial circumstances, a larger proportion of households might find themselves effectively, and indeed legally, bankrupt. This latter tendency will be exacerbated to the extent that it has become both easier, and culturally more acceptable, to do so.

How far house prices might fall is hard to predict, as is the prospective pace of the decline. On the one hand, it is tempting to suggest that the “excessive” part of the increase should

[10] The household sector now bears more risk in the workforce, given that contracts and part-time work are increasingly replacing traditional long-term relationships. Defined benefit pensions are being increasingly replaced by those with defined contributions.

eventually reverse, but providing a measure of the "equilibrium" value of the housing stock is not easy. In particular, the underlying valuations will be much affected by what is going on in the economy (growth, jobs, financial developments), which in turn will be much affected by what is going on in the housing market. One possibility is that those who have become overindebted due to housing will try to trade down to more affordable levels. This of course raises the prospects of crowded trades and potentially sharper price movements.

Another possibility is that house prices could stay higher permanently. An implicit assumption behind the above discussion was that these increases were essentially due to lower interest rates and speculative forces rather than due to fundamentals. But it is not hard to tell a story about supply side (tight zoning regulations, little available land) or demand side (immigration, declining size of individual households) factors that could account for permanently higher house prices relative to those of other goods and services. In this case, the restoration of a more normal ratio of house prices to rents would occur through an increase in rents. The payback referred to above would then occur through diminished consumption of non-housing goods and services. This would reflect both higher rents themselves and the higher saving required to accumulate the down payment needed to purchase a more expensive house.

Two other potential problems can arise as the spending prompted by illusory wealth unwinds. How serious those problems might become will depend to some degree on the level to which the saving rate rebounds. One possibility is that households have a target level of saving. In this case, the explicit saving rate out of disposable income will rise to the target level from the current level, artificially depressed because of the existence of illusory savings associated with house price increases. Another possibility is that households have a target level for wealth. In this case, the saving rate must rise even more to compensate for the real saving that did not take place during the years when saving was depressed. This would evidently have more serious consequences on spending, income and the whole cumulative process affecting GDP and employment. Keynes described this as the "the paradox of thrift": if we collectively try to save more, we may in the short run wind up saving less in aggregate.

One complication could be the effect of a housing-induced downturn on the financial system. Fortunately, at the current juncture, the banking system in virtually every industrial country seems well placed. Profit levels are historically high, the sources of income on the income statement are well diversified, and capital levels are also high. Yet the full effects of a household-induced slowdown might still prove serious. A number of different revenue sources on banks' income statements, of growing importance, are in fact derived from household spending. The fact that most householders will try desperately to service their mortgages could still leave these other income sources vulnerable. Moreover, any serious form of downturn would affect the corporate sector in turn, and increase the expected losses associated with corporate loans.

To complete the analysis of the whole dynamic process, were the financial system to become seriously threatened, it is likely that the normal process of credit creation would be impeded with further negative implications for economic activity. This is what happened in the United States in the 1930s and in Japan in the 1990s, though in both those cases, there was a much heavier reliance on bank lending. Fortunately, in most countries today the sources of credit are much more widely diversified. This is the good news to go along with the bad news that it was the increased diversity of the credit sources that contributed significantly to the problem of too little real saving in the first place.

The second complication that might arise, as saving rates increase, has to do with the trade account. If a country has a trade deficit (as is common when domestic saving rates are low), more domestic saving will help reduce that deficit. However, this will also imply an economic slowdown unless the exchange rate declines, backing in foreign demand to replace domestic demand. The problem arises because, as noted above, capital embodied in the form of housing is essentially non-tradable (cannot be easily sold to foreigners) and is non-fungible (cannot be easily adapted to produce something other than housing services). Thus, the

degree of currency depreciation required to induce the required shift out of the production of non-tradables into tradables will be greater than would otherwise have been the case. This increases the likelihood of disruptive movements in exchange rates, with potential implications for other financial markets as well.

E. Challenges for policymakers

If, as hypothesised above, consumers' perceptions of their wealth can be wrong, then this implies cyclical movements in the economy will be exacerbated. What might the monetary and fiscal authorities do to prevent such problems emerging in the first place (moderating the "boom")? And what might they do to minimise the scale of the resulting downturn (moderating the "bust")?

In the upswing, both monetary and fiscal policy should tighten. This makes sense in terms of leaning against potential inflationary pressures. However, it also makes sense in terms of moderating the resulting bust, whose severity is very likely to be closely related to the magnitude of the boom which preceded it. Suggesting such policies is akin to saying that monetary and fiscal policies should be conducted with a rather longer-term view than is currently fashionable. In the case of monetary policy, it implies being concerned about the way that current credit creation might manifest itself, not solely in terms of near-term inflation, but prospectively in the form of deflation over a longer period as the full implications of the bust phase become evident. In the case of fiscal policy, having a longer-term policy horizon implies an increased focus on how the stock of government debt might evolve over time rather than the behaviour of the deficit as such.

This suggestion about the conduct of monetary policy remains highly controversial. One reason is that "inflation targeting" has become an increasingly accepted framework for the conduct of monetary policy, and in most cases this has been taken to mean hitting a target for inflation (say) one or two years out. Should the forecast indicate "no problem" over that horizon, then it becomes extremely difficult to justify raising interest rates. Another reason is that it is in fact difficult to identify with any certainty when problems of this nature are in fact building up.

There is, moreover, a particular problem in current circumstances where many real side developments have combined to keep a lid on global inflationary pressures. Deregulation and technological advances are raising productivity levels and keeping costs down. The re-entry into the global market economy of previously highly planned economies, China and India in particular, has massively increased the global supply of labour with implications for wages everywhere, especially for the relatively unskilled. The danger posed by the standard inflation targeting framework is that these positive supply side shocks can be misread as an absence of demand. This can lead in turn to a call for easier monetary conditions, rather than the tighter conditions consistent with moderating an upturn associated with illusory saving. Indeed, as we look at global monetary conditions worldwide, they have been and remain unusually expansionary.

The suggestion that fiscal policy should be tighter in upturns is less controversial at the level of principle. Increasingly, the fiscal authorities do focus on the level of debt rather than just the size of the deficit, and the associated need to create "room for manoeuvre" in response to downturns. But, in practice, as automatic stabilisers in the cyclical upturn reduce deficits, there is again a common tendency to say "no problem". The current large government deficits in the United States and many large European countries attest to the power of these tendencies.

A further justification for tighter fiscal policies in upswings, particularly those fuelled by illusionary saving, is that governments have so many liabilities that are not part of the official stock of government debt. The most obvious of these are obligations associated with social

security; in particular, state pensions and medical care. A recent calculation of the obligations of the US federal government in this regard provides an estimate of over 500% of GDP.[11] While the specifics of the methodology might be questioned, no one would deny that this issue needs more practical attention than it is receiving. Moreover, governments have all sorts of explicit contingent liabilities as well (in particular, guarantees of various sorts, including such financial guarantees as deposit insurance), to say nothing of implicit guarantees against the effects of such things as natural disasters.

It is important to note that government pensions are, in most countries, essentially transfers. To the extent that they are not funded through a true increase in saving (out of current consumption) they too are illusory saving, adding nothing to wealth at the level of the country as a whole. Moreover, given the magnitude of the tax increases needed in many countries to honour the government's commitments, in many cases against the backdrop of a declining population of working age, it may well be that those commitments cannot be honoured under the currently agreed terms. Thus, there may even be a degree of illusion at the level of the individual.

Governments have traditionally turned to inflation in such circumstances, but history also reveals the problems associated with such a solution. A better approach, and certainly better than an outright government default, would be to change the terms of the contracts to make them more viable. For example, raising the age barrier before paying out pensions would both raise government revenues (more workers) and reduce government expenditures (fewer pensioners). More transparency on the part of governments about these issues might also help to raise the saving rate of the private sector. Allied with smaller government deficits, the end result of more saving would be a larger domestically owned capital stock. This too would contribute to higher potential growth over time, the only true source of wealth and credible commitments.

Policies to avoid booms seem preferable to polices to mitigate the problems of busts. In large part, this is due to the inherent limitations of such policies. Easing monetary policy might run quite quickly into the "zero lower bound" problem (think of Japan for much of the last 10 years), might not stimulate demand as intended (Keynes's concern about "pushing on a string") and would in any event have many unwanted effects on the supply side of the economy. Contrast, for example, Schumpeter's call for "creative destruction" with the way in which "zombie companies" have been kept alive through super low interest rates in Japan. And as for easier fiscal policy, more government spending might just lead to a still sharper increase in the household saving rate and higher risk premia on government debt. This is not to say that these policies would not be recommended in the event of a saving-induced downswing, but that it would be better to avoid the need in the first place.

F. Challenges for statisticians

It is worth noting that the data requirements of central bankers have actually grown significantly in both frequency and complexity in recent years. This is due both to globalisation and to the growing role of financial variables in explaining economic behaviour in a world of increasingly liberalised and market-driven financial systems.

Begin with the fundamental assumption that central banks set interest rates in response to an assessment of the outlook for sustainable economic activity. An important question with respect to near-term inflation prospects, which might be viewed as the traditional threat to

[11] Kotlikoff (2006).

sustained growth, is whether the level of aggregate demand is above or below the economy's capacity to supply. A key difficulty is that we cannot observe the true values of many key macroeconomic variables such as aggregate demand. Estimating the supply potential of an economy is fraught with even more hazard. And in recent years, as the process of globalisation has gathered pace, the adequacy of purely national data to inform about inflationary pressures have grown ever more suspect.[12] In sum, statisticians have their work cut out for them, even with respect to traditional endeavours.

But, as my remarks have tried to make clear, central bankers are increasingly aware that sustainable growth can be threatened in a second way. Financial imbalances of various sorts can build up and then unwind with significant effects on demand and output. Should such processes occur with inflation initially quite low, the outcome could be eventual deflation, bringing its own unique set of problems. Clearly, a challenge for statisticians in this world is to improve our measurement of all the relevant financial variables, not least those pertaining to the balance sheets of the household sector.

There is no doubt that much progress is being made in this regard. For example, the European Central Bank and Eurostat (the Statistical Office of the European Communities) on 31 May 2006 published for the first time a set of annual European accounts for institutional sectors covering the period 1999-2004. These integrated non-financial and financial accounts included financial balance sheets for households, non-financial corporations, financial corporations and governments, for individual member states and for the European Union as a whole. Use of these accounts will undoubtedly lead to a deepening of our understanding of the transmission mechanism of European monetary policy and related issues. Yet, in contrast, it must also be noted that many challenges remain. A general issue is that data on household financial asset holdings in developing countries remain particularly sparse. As for more particular challenges, let me make the following suggestions.

First, a stronger emphasis on balance sheet considerations in national income accounting (ie integrated flow and stock accounts) is required if the effects of changes in household balance sheets (particularly estimates of changes in wealth) on spending are to be better estimated. One source of improvement in this regard would be to treat the household sector less as a residual sector when compiling the national accounts. Moreover, we should try to establish greater consistency between bodies (and sectors) reporting financial statistics (such as the issuance of debt securities and FDI) and non-financial statistics (such as consumption and gross fixed capital formation) to facilitate analysis of how the former impinge on the latter.

Second, it would be useful to make clearer distinctions, as already envisaged in various SNA manuals, between volume changes and valuation changes in accounting for changes in the net worth positions of households. We should also aim for a more consistent treatment of valuation gains and losses by holding sector and by financial instrument. In the area of valuation, it must be noted that the statistics currently collected on the prices of both residential and non-residential structures are still inadequate in many ways. Moreover, in many countries, historical data is almost non-existent. When one considers the role played by such prices in economic cycles, the absence of such data is almost shocking.

Third, we should strengthen the data on the distributions of assets and liabilities. For example, we might wish to know the differences not only between rich and poor households, but also between homeowners and tenants, as well as between net receivers of government expenditures and those taxpayers who fund them.

Finally, it would seem desirable to take more account of contingent assets and liabilities in the household accounts. In this context, establishing complete, consistent and verifiable rules

[12] For an interesting empirical analysis of this phenomenon, see Borio and Filardo (2007).

for the reporting of statistics on pensions and social security expenditures would seem to be a high priority.

It is one thing to determine conceptually what sorts of data are required to test economic hypotheses. However, it is quite another thing to determine how that data might best be collected. As will be discussed later today, an important issue is whether direct household surveys on financial wealth, indebtedness and expenditure add value in monitoring the household sector, in terms of both quality and timeliness. Another is whether such data could be used to cover current data gaps; for example, related to securities held by households. There are many practical issues for central banks concerning the design and stratification of surveys, to say nothing of the need to develop expertise in this area.

G. Concluding remark

Through the papers presented to this conference, central bank statisticians have confirmed that they are working closely with statistical offices to transform the quality of national official statistics. These efforts to improve the quality of national and global statistics on the household sector are certainly worthwhile. They will, in the fullness of time, ensure that policymakers have the high-quality and timely information needed to make good decisions in today's complex financial world. While no longer a policymaker, but still closely associated with them through my work at the BIS, may I thank you on their behalf for your dedication to this important objective.

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Summary of conference discussion[1]

The household sector is becoming more important for central banks as a result of a number of factors. Households, together with non-financial corporations, are the key drivers of the economy. In addition, households and financial markets are becoming increasingly dependent upon each other as households attempt to improve the smoothing of their consumption across their lifetime and as financial markets develop services to facilitate this. The conference discussed the interaction between households and financial markets and agreed that a sound analytical framework is required to measure the financial position of the household sector. It was also recognised that central banks need to have access to data for this sector that are timely, methodologically consistent, and comprehensive.

It was felt that financial and national accounts data provide, in principle, a full coverage to assess the financial position of households, in terms of flows as well as stocks. They also provide information on the interaction between the household sector and the financial system more generally. At the same time, there is a need for more detailed information on household assets (wealth) and liabilities (debt), including on their distribution across income categories. Moreover, sample surveys are increasingly being used to gather information on specific financial transactions and positions of households. With respect to cross-border financial transactions involving the household sector, remittances have become important in many countries. As a consequence questions have arisen on which international methodological standards to use when compiling data on remittances.[2]

Statistical issues in the measurement of household wealth

The conference discussed whether existing international standards and definitions of household wealth are adequate and whether they can be applied in a flexible way without losing cross country comparability. It was recognised that some of the difficulties in measuring household wealth are caused by the complexity of the concept and a lack of agreement on the basic construction of the aggregates. These issues present challenges to efforts to improve existing standards and terms, and to create new ones. Furthermore, any changes in household wealth measures increase compliance costs for data compilers and may cause confusion for data users. A trade-off also has to be made between adapting national statistical data to international standards and ensuring consistency within countries between definitions of household wealth and those of other macroeconomic data.

The Luxembourg Wealth Study is an initiative to improve wealth accounting. The study defines uniform concepts, but aims for “exposed and flexible” harmonisation to permit cross country comparisons. Looking ahead, the OECD will collect data in 2008 on pensions and insurance to provide more accurate measures of this element of household financial wealth. It was recommended that there should be discussion in the future on national experiences in measuring household wealth to determine best practices and to encourage harmonised definitions.

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[1] The summary of the conference discussion was prepared by various staff members of the BIS Monetary and Economic Department, including those providing the Secretariat of the IFC. It does not necessarily reflect the views of the chairpersons of the respective sessions nor of the contributors or participants.

[2] The Irving Fisher Committee organised a session on remittances at the IAOS conference entitled "People on the Move" in September 2006 in Ottawa. The papers presented at this session will be published in IFC Bulletin No 27.

A number of specific issues related to measuring the wealth of households were identified at the conference. One relates to the informal economy and whether/how this could bias the measured financial position of the household sector. Another was the measurement of the value of unquoted shares. Finally, there may be a gap between the securities holdings of households identified by custodians and the figures reported through other sources by households. One reason for this may be that financial holding companies managing wealth of households are sometimes difficult to identify and/or that company registers may not always reveal the owners of enterprises.

Measurement issues with respect to household debt

The rapid increase in the value of household debt in recent years, both in industrialised and emerging market countries, appears to reflect rapid growth in mortgage debt. One issue that was identified was the need to properly measure mortgage debt denominated in foreign currency, which could significantly increase the foreign exchange exposure of households. A proper measure of this exposure is needed to evaluate how exchange rate volatility could potentially compromise macroeconomic stability and the soundness of the financial system.

Another issue that was discussed relates to securitised housing loans. Mortgage lenders can reduce their balance sheet risk by transferring loans to a special-purpose vehicle which issues securities against the loan pool. In many countries this securitisation has become very important. This may complicate the measurement of total mortgage debt outstanding as it no longer shows up on banks' balance sheets. It may also become more difficult to statistically measure the "funding" of mortgage debt.

Distributional aspects of household finances

Households are much less of a homogeneous group than generally believed. Indeed, their behaviour can vary greatly depending on their composition, the age of household members, their income bracket, their sources of income and borrowing and other characteristics. Central banks want to take this into account when analysing economic developments and anticipating households' reactions to changes in monetary policy. For example, central banks might be interested in information about the typical financial position of households which have taken out mortgage credit at variable interest rates.

There appears to be a paucity of timely official statistics on distributional aspects of household finances. Financial institutions have access to their customers' financial information in order to assess the distribution of credit risk among households (probability of default as well as loss in the case of default). However, this detailed information is not directly available to central banks.

Some central banks have therefore come to rely on household surveys or micro data bases to improve their understanding of the distribution of debt and wealth across income categories. This allows them to identify which types of households are more likely to be affected by adverse economic shocks. For instance, it may be important to know the age distribution of households. The life cycle hypothesis suggests that younger households should have a high value of debt and a low value of assets, while older households should have a low value of debt and a high value of assets. However, older households on pensions are likely to have smaller financial margins making them more susceptible to adverse economic shocks. Furthermore, there is evidence that financial innovation in industrialised countries has resulted in older households accessing equity from their homes by borrowing against it.

Using surveys to gather information on household finances

In many cases aggregate information on household financial positions is obtained indirectly, for instance through data from financial institutions. Alternatively, it is obtained in official statistics as a residual item. Sample surveys are increasingly being used to complement traditional sources for measuring the financial position of households. In many countries central banks have started to sponsor surveys of households (they conduct the surveys themselves, outsource them to a third party or attach specific questions to surveys conducted by national statistical institutes).

The conference discussed the benefits and challenges of household surveys. Surveys can be used to verify the consistency of, and cover particular gaps in, national and financial accounts data. The use of surveys is often the only way to gain insight into the distributional aspects of household finances. It also allows evidence to be obtained on particular financial transactions, such as housing equity withdrawal, and to determine how informed household borrowers are about the terms and conditions of their mortgage loans. Finally the development of surveys may strengthen cooperation between national agencies on survey design, coverage, and analysis.

Household surveys also pose a range of challenges for central banks. The latter often do not have the in-house expertise to design and conduct surveys. Also, the analysis and communication of survey results require particular skills that may be different from those associated with more traditional statistical analysis. Importantly, the conduct of surveys is time consuming and it may be difficult to use survey results in a timely way to construct national and financial account statistics. Consequently, some central banks have increased the frequency of their household surveys.

A major example of challenges discussed at the conference relate to the potential bias resulting from the reluctance of high-debt and high-wealth households to respond to surveys. Even if high-wealth households do respond to surveys, they tend to understate their income and assets. This has been confirmed by comparisons of survey data and financial accounts data, which revealed large discrepancies in the value of household assets. Though rich households can be over sampled, privacy laws may reduce the possibility of adequate coverage of these household strata.

The IFC intends to organise a number or regional workshops to analyse the use of sample surveys in the data compilation by central banks.

Session 4

Measurement issues with respect to household debt

Chair: Leon Taub
Federal Reserve Bank of New York

Papers:

The domestic financial position of the household sector in Mexico
Alfonso H Guerra de Luna and Jessica Serrano Bandala,
Bank of Mexico

Financial margins in Norwegian households - An analysis on micro data for the period 1987-2003
Bjørn H Vatne, Central Bank of Norway

Household debt, interest rates and insolvencies in South Africa
Johan van den Heever, South African Reserve Bank

The distribution and dispersion of debt burden ratios among households in Poland and its implications for financial stability
Sławomir Zajączkowski and Dawid Żochowski, National Bank of Poland

Risks to Romanian financial stability stemming from the household sector
Florian Neagu and Angela Mărgărit, National Bank of Romania

The domestic financial position of the household sector in Mexico

Alfonso H Guerra de Luna and Jessica Serrano Bandala[1]

1. Introduction

In Mexico, while financing granted by financial intermediaries has been closely monitored, not a lot of research has been made in order to measure the household sector financial position. This article describes the construction of the financial position of the household sector in Mexico using aggregate financial data from 2000 to 2005. While several methods to measure household sector financial position have been addressed in the international financial literature, in Mexico there is no single widely used methodology on this topic. In this paper we measure household's financial position using a methodology that is consistent with the overall uses and sources of the economy and the monetary and financial aggregates, mainly using public available data. The aim of this paper is to provide a methodology to measure households financial position which posits a straightforward relationship between assets and liabilities.

In this article we describe the principal instruments used by households either to save or receive credit since most of these instruments have changed dramatically over the last years. On one hand, credit to households had a noticeable expansion both by the banking sector and by other intermediaries. Banking credit for consumption has been showing positive real rates of growth since 2000, while banking credit for housing started its expansion in 2004. Other intermediaries like non-bank mortgage originators and government sponsored funds (Infonavit) have been important sources of financing particularly to low income households. On the other hand, after a profound reform of the pension system in 1997, households savings have shown a remarkable increase in the last decade. In addition, nowadays the private sector has access to other investments options, in particular investment funds have increased their market participation considerably.

The paper is structured as follows. Section 2, provides a brief introduction to the macroeconomic context in which the household position is measured. In order to understand current household financial position we contrast the main differences between the current macroeconomic situation and the one before the 1995 crisis. Additionally, we describe the profound changes that have taken place in financial intermediation. In section 3, we describe the principal sources of information both for the liabilities and assets sides of the households' balance sheet. This is important because there have been major changes to the primary data sources in Mexico that have enabled the use of the methodology presented in this paper. In section 4 the estimation of households' liabilities is presented, describing the consumption and mortgage credit markets, the principal financial intermediaries and the characteristics of the main instruments. On the liabilities side, we observed a remarkable credit expansion, which started with consumption credit and have been extended to mortgage credits. Section 5 develops on households financial savings. Of high importance, along with macroeconomic stability, is the role played by public pension funds and investment funds in explaining the increase in financial deepening. Financial savings have increased

[1] The views expressed are those of the authors and do not necessarily reflect the views of the Bank of Mexico. This paper is part of a broader research agenda. Emma T. Martínez, María E. Ortega, Manuel Sanchez, Javier Vazquez and Diana Morales participated in related research activities.

considerably, particularly because of the compulsory public pension funds. Section 6 combines households' assets and liabilities in order to construct the balance sheet. Then an estimation of households' net financial position is reported using different indicators. Section 7 includes the final remarks. At present the financial position of Mexican households as net creditor is still large relative to its income. This could imply that there is still room for credit expansion, although it is important to recognize that the current financial situation of the household is mainly related to compulsory savings.

2. Macroeconomic context: two credit cycles in Mexico

In the last decades, financial intermediation in Mexico has undergone profound changes. In order to analyse household's financial position it is important to understand the context in which it is developed. In the early 80's financial markets were completely closed and commercial banks were under the direct control of the government. Nowadays, domestic financial markets have strengthened and deepened, they have been fully integrated with international markets and have become more sophisticated. Nevertheless, in Mexico financial intermediation is still low, both compared to international levels and to the size of the Mexican economy.[2]

During the past two decades there have been two important credit expansions to households. The first one occurred during the first years of the 90's, the second started in 2001. From many perspectives, these two episodes performances are very different. First of all it is important to understand the Macroeconomic situation in which these credit expansions occurred. From 1991 to 1994 although inflation went down substantially there was a perception of high contingent risks. For example this uncertainty was reflected in government debt either as a shortening of average maturity (see Figure 1) or the use of foreign currency denominated bonds. Currently, as inflation has gone down the average maturity of public debt has increased substantially and foreign denominated liabilities have been reduced.

There is a clear relationship between inflation and the maturity of financial contracts. In countries with a history of inflationary episodes, there is a high pass-through effect from macroeconomic instability to the quality and access to financial resources, especially for households. This is important because many of the financial instruments characteristics are very sensitive to the macro context. In particular, the recent abatement of inflation has allowed the strengthening of domestic markets for fixed rate instruments. As inflation has gone down the issuance of longer term contracts has increased considerably, reflecting that agents have been able to broaden their planning horizons. During the first half of the 90's, although mortgage credit was issued at long maturities, they were signed under variable interest rates instruments or indexed to inflation. In particular a dual index mortgage was widely used and is still the base for the main mortgage instruments used by public entities for low income housing credit (see Box 1 in section 4.2). Nevertheless, today the most common mortgage instrument used by private financial intermediaries is a fixed rate loan.

Inflation reduction has also been reflected in an increased supply of financial savings. Financial deepening, measured by the broad monetary aggregate M4, has increased from 35.9 percent of GDP in 1991 to 52.2 percent in 2006 (Figure 2a). Overall, macroeconomic stability has implied better conditions for households' credit and an increase in the availability of financial resources.

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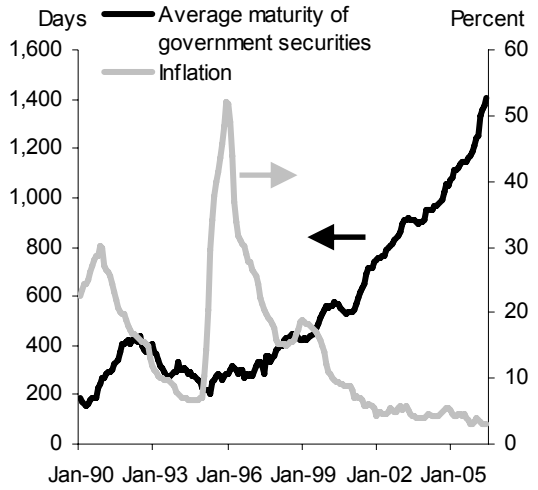
[2] See Sidaoui (2006) for a description of the main developments in the Mexican financial market.

Figure 1

a. Average maturity of Government securities and inflation



b. Government interest rate

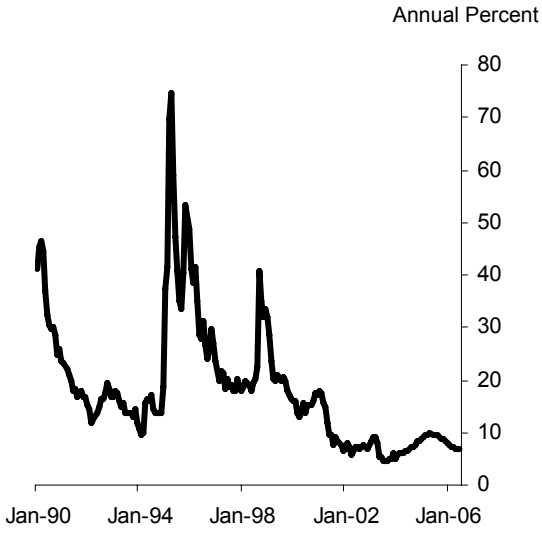


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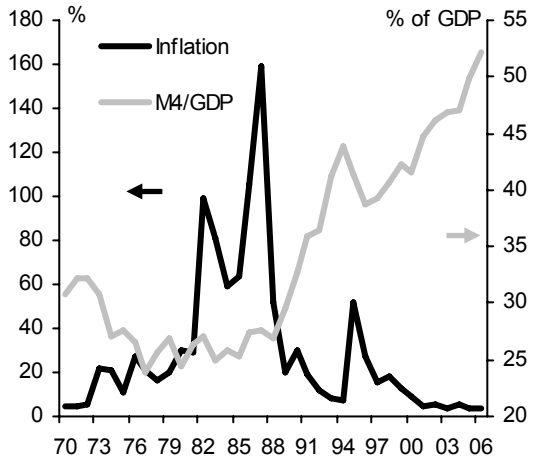
Figure 2

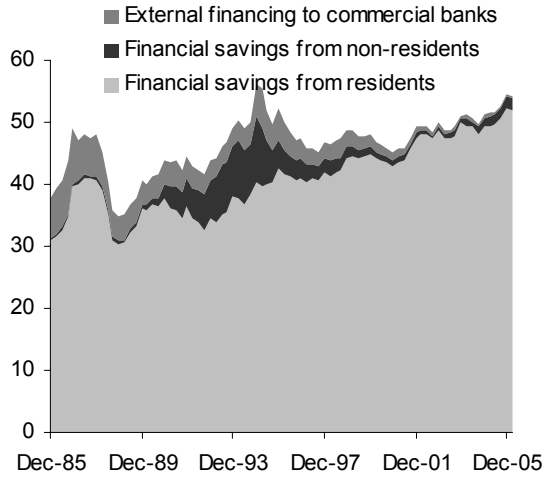
a. Financial savings (M4) and inflation

Percentage and percentage of GDP



b. Financial savings and banks foreign liabilities

Stocks as percentage of GDP



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A second perspective to analyze these two episodes is the flow of funds, since the sources of the two credit cycles are very different. On one hand, most of the first credit expansion, from 1991 to 1994, was possible because of capital inflows, especially in the form of financial savings from non-residents and an increase on banks' foreign liabilities (Figure 2b). On the other, the current increase on credit to households is based on domestic financial savings. Also the role of financial intermediaries has been completely different. In the first episode banks were the main

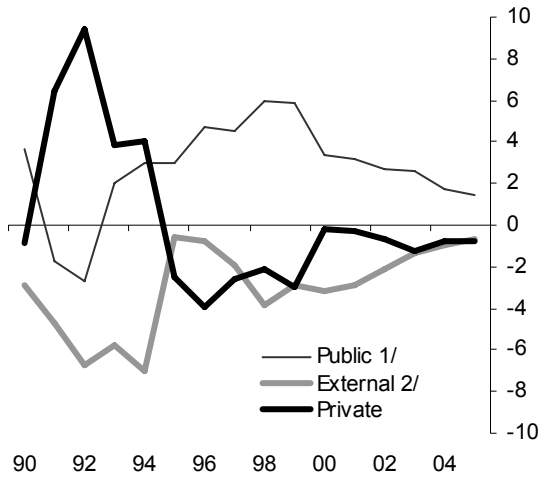
participants, while in the current expansion other financial intermediaries have taken a more active position.

In addition to the differences already mentioned it is important to point out the role of the public sector and the crowding out of financial resources. During the 1991-1994 period there was an important expansion on financial intermediation by public development banks, which in part sustained the private sector deficit.[3] After the 1995 crisis the public sector demanded most of the increase in financial savings leading the private sector to be a net creditor in the domestic markets (Figure 3a). However, by the end of 2000 bank financing to the public sector began to drop and a crowding in effect with the private sector was observed, particularly with households (Figure 3b). Finally, it is worth mentioning that households' credit is still low compared to the levels that it reached during the first half of the 90's.

Figure 3

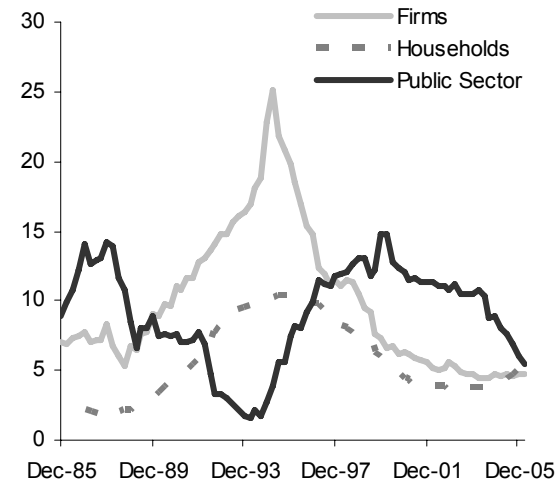
a. Net financing received by sector*

Flows revalued as percentage of GDP



b. Commercial banks financing

Stocks as percentage of GDP



* Positive sing=debtor position. 1/ Public sector borrowing requirements (PSBR). 2/ Current account of the balance of payments.

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3. The sources of information

Most of the information available to measure household sector financial position is gathered from financial intermediaries by Mexican authorities. In this regard, after the 1995 Crisis, the supervising entity, Comision Nacional Bancaria y de Valores (CNBV), and the Central Bank (Banco de México) have made outstanding improvements in data collection. Table 1 presents the type of information collected by supervisory and regulatory entities regarding household financial positions. However, these authorities collect information pursuing different objectives, while CNBV objective is to supervise the operations of financial intermediaries; Banco de

[3] See Gil Díaz and Carstens (1996).

México objective is to promote the development of the financial system. As we mentioned before the objective of this paper is to provide a methodology for measuring household financial position using public available data. Even when CNBV publishes information on financial operations we used Banco de México's published macro financial information since it has special emphasis on sectoral transactions. In fact, using Banco de México data is possible to distinguish financial intermediaries operations with all economic sectors. Therefore, it will possible to extend the methodology used on this paper to measure other sectors financial position.

In order to follow up sectoral transactions, Banco de México collects data by sector and type of financial instrument at disaggregated levels. Consequently, financial intermediaries' information can be indirectly utilized to construct household balance sheets. On the asset side of financial intermediaries' balance sheets detailed information on holdings of issues and securities, loans and credits is available. On the liabilities side, the most important item corresponds to short and long term deposits. Therefore, as long as it is possible to identify the sectoral counterparts of financial intermediaries' transactions, it is possible to follow up households positions.

Table 1

Information related to households gathered by financial authorities

Concept and frequency of submission by intermediary

Information on	Banks	Financial Leasing Companies	Brokerage Houses	Foreign Exchange Firms	Financial Factoring Companies	Financial Holdings	Investment Funds	Pension Funds	Special Purpose Financial Companies	Credit Unions
Assets and Liabilities	M	M	M	M	M	M	M	M	M	M
Holdings of Securities	M	M	M	M	M		M	M	M	M
Credit Portfolio	M	M			M				M	Q
Other Accounts Receivable	M	M	M	M	M				M	M
Bad Debt Asset Recovery	M	M			M				M	M
Deposits from the Public	M	M			M				M	Q
Penalties and Losses	Q	M	M		M				M	M
Financial Statements	M	M	M Q	M Q		M Q	M	M		M
Risk Assessment	Q								M	M
Other Accounts Payable		M	M		M				M	M
Goods on Deposit		M								M

Note: For the purpose of this table, M refers to monthly frequency and Q to quarterly frequency of submission.

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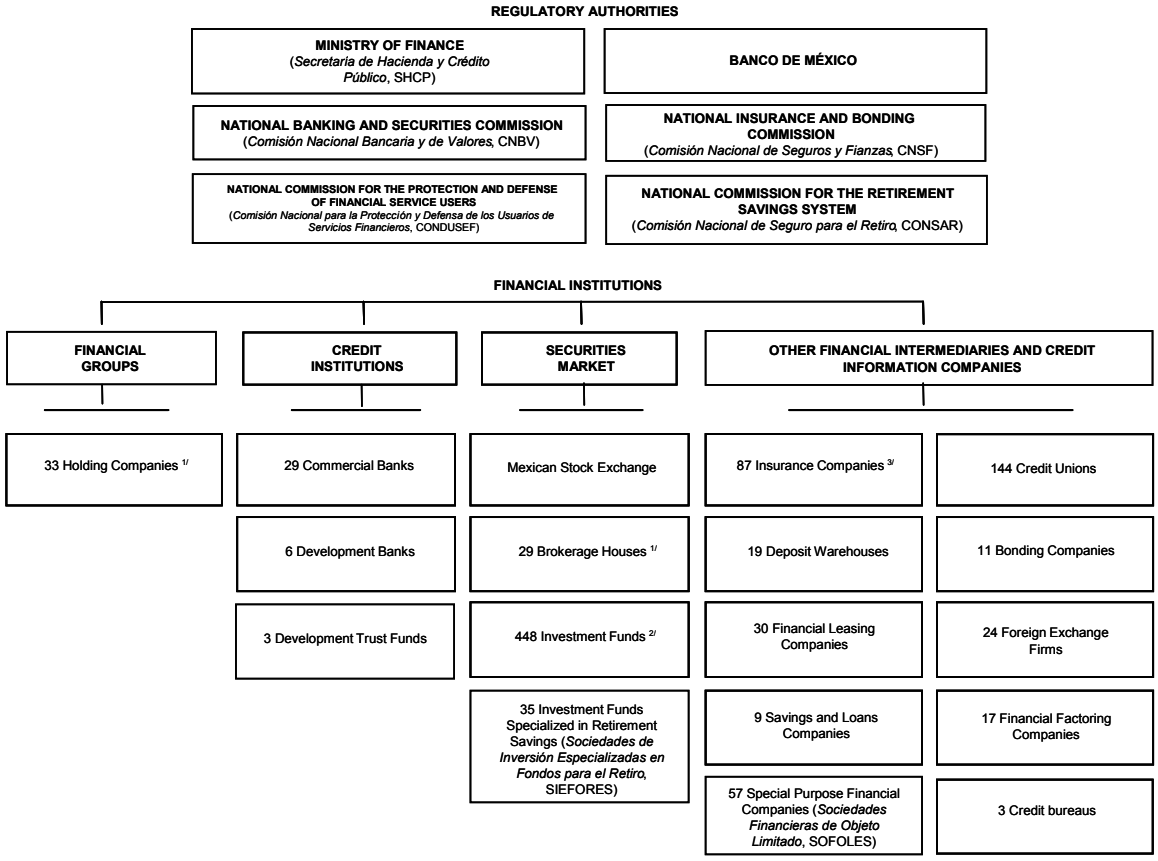
Following data collection, Banco de México publishes on monthly basis assets and liabilities of financial intermediaries identifying their sectoral counterparts. The first main distinction made on counterparts is according to residence. When a unit engages and intends to continue engaging in economic activities and transactions on a significant scale in Mexico it is considered a resident, non

resident is considered otherwise.[4] Once acknowledged by residence, economic units are classified in the following sectors:

- Financial corporations.
- General government.
- Non-financial corporations.
- Households.

Table 2

Mexican financial system in 2005



1/ Source: National Banking and Securities Commission (Comisión Nacional Bancaria y de Valores, CNBV). 2/ Includes stock investment funds, fixed-income investment funds for both individuals and enterprises, equity investment funds, and investment fund holdings. 3/ Includes insurance companies, insurance companies specialized in pensions, and health insurance companies. Information up to December 2005.

Financial Corporations in Mexico are those financial institutions that are subject to government regulation and supervision. Table 2 describes current Mexican Financial System structure. General government corresponds to central government, state and local governments and those sectors which liabilities are supported by the government. Non financial corporations are private enterprises and individuals with entrepreneurial activities.

4 This definition of residence it mostly used by international organizations like the International Monetary Fund and the Bank for International Settlements.

Households are those individuals or group of individuals that conduct economic transactions not related with entrepreneurial activities. Therefore for the purposes of this study we will follow up assets and liabilities with this last sector.

Finally, it is worth mentioning that Banco de México publishes aggregate measures of total liabilities of the private sector (households and firms). Liabilities are presented by intermediary and classified by type of loan (consumer and mortgage loans). Also information is available by instrument, like credit cards, personal loans, etc.

Several presentations of overall financial savings are regularly published by Banco de México. Nevertheless, a sectoral classification, dividing by households and firms, is not yet published. This paper is part of a broader research agenda and presents estimations of households' M2 (domestic financial savings by residents) in the context of the overall financial assets.

In addition to the information of sectoral transactions of financial intermediaries published by Banco de México is important to considered other sources of financing available for the household sector. In Mexico Infonavit and Fonacot are the most important government supported institutions that entitle transactions with households. The former offers mortgage financing and the later provides consumer financing to households. These institutions publish quarterly financial statements where it is possible to identify households' positions.

4. Household liabilities

In recent years there has been a gradual lift of credit restrictions faced by households. These restrictions were characterized by a limited credit supply an high interest rates. To illustrate the increased access of households to credit, it is worth to mention that the number of individuals registered in the credit bureau augmented from 13.9 million in 2000 to 37.1 million in 2005.[5]

In order to boost financing to households it is important to have a robust credit and loan reporting system. The accessibility to the credit history of borrowers enables the issuing of loans in better conditions and has been an important factor for the recent expansion of credit to households. Until the early 1990s, very little credit information was available and shared in the Mexican financial markets. The only information sharing mechanism available at that time was a public registry held by Banco de México. At present, there are two private credit registries that contain information from banks, as well as a number of non-bank financial institutions, retailers and other creditors (Figure 4).[6] However this industry is still in evolution since an important part of informal credit providers are not included in these registries. Access to this type of information will enable the possibility to construct more accurate households' balance sheets.

4.1 Consumer credit

The main intermediaries in the market of credit to consumption are commercial banks that account for 77 percent of the portfolio. Sofoles (non-bank banks) have 9 percent of the market and other sources of financing have the additional 14 percent.

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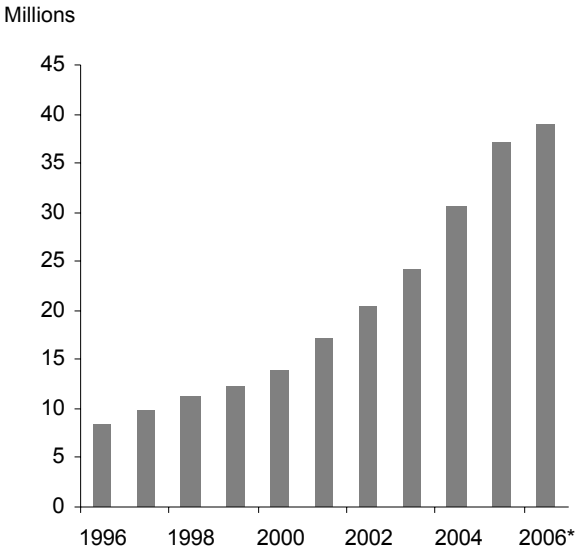
[5] This information corresponds only to "Buró de Crédito" data.

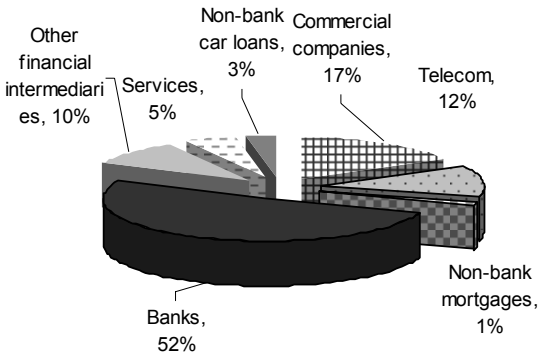
[6] For detailed information on this regard see "Credit and loan reporting systems in Mexico", World Bank, March 2005.

Figure 4

a. Number of files



b. Structure of data base

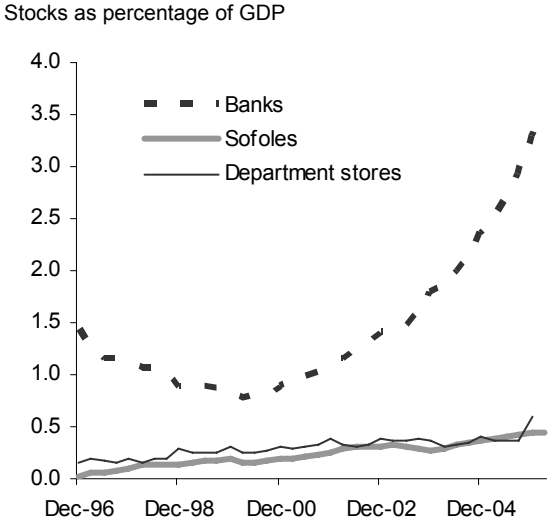


* Source: Buró de Crédito

Consumer credit was the first market to recover after the financial crisis. The common interpretation is that it has the highest adjusted rate of return on assets. In particular the credit card market had an impressive recovery both measure by the number of cards and by the value of the market. According to Banco de México information on settlements, at the end of 1994 there were 10.5 million credit cards, in May 2006 this number reached 26.2 millions. The market doubled measured as percentage of GDP. Also the amount of transactions (billing) has increased rapidly from 4,880 million pesos in 1994 to 29,484 millions in May 2006 (Figures 5 and 6).

Figure 5

a. Consumer credit



b. Bank consumer credit

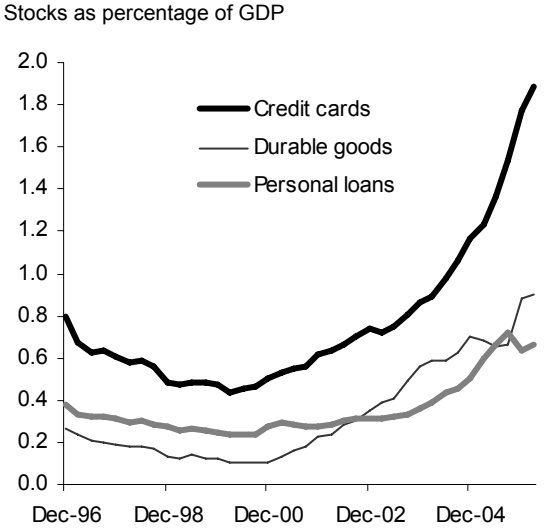


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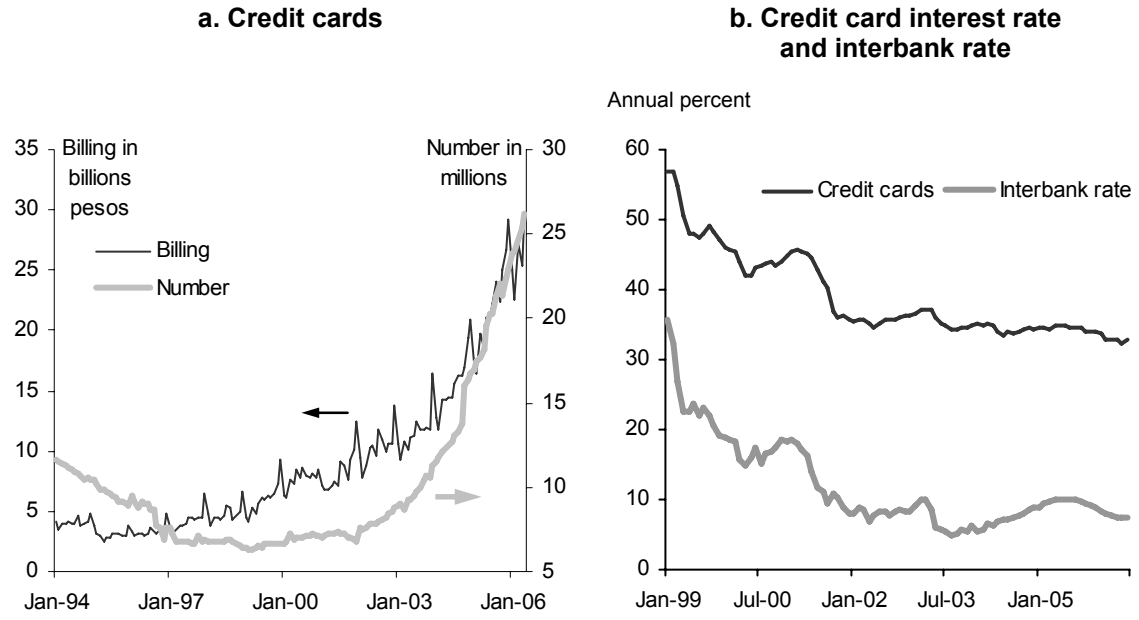
Figure 6



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Interest rates charged on credit cards are still very high, around 32 percent annual rate, for the traditional instrument. Also to consider are the commissions charged by banks that actually account for an important part of their non-interest income.

Expansion on consumer credit has not only been through credit cards, but also other types of credit have shown similar trends. Other credit to consumption by commercial banks is usually linked to the acquisition of durables goods, specially cars and home appliances. Recently other personal loans have been quite successful since they are usually linked to payroll assigned accounts. The increase in the number of accounts used to pay wages has created a business opportunity for banks. With payroll assigned accounts banks know the income of the debtor and can issue a contract to pay directly the personal loan from the payroll account. Usually the maximum amount of the loans are promoted as a number of times the monthly income, measured by the deposit in the banks' account, and payable within a year. Overall, commercial bank financing to consumption has been increasing at high rates since 2000, however the proportion of non performing loans to total loans is around four percent (Figure 8a).

As mention before, not only commercial banks have expanded consumer credit but also other intermediaries. Sofoles have found commercial credit as an important opportunity to target services to households. Most of the Sofoles that provide consumer credit are oriented to the acquisitions of cars, usually in partnership with manufacturers. As of March 2006, according to their assets 29.3 percent of Sofoles were oriented to automobile acquisitions and 3.6 percent directly to consumption. In addition of the financing granted by financial intermediaries, households have access to consumer credit through department stores and Fonacot. As mention before, financing granted by these credit sources represents 14 percent of total credit to consumption.

4.2 Mortgage credit

There are three major players in the Mexican mortgage market: Infonavit (government supported fund for low income housing, 59 percent of the value of mortgage portfolio),

commercial banks (mainly middle and high income housing, 25 percent of the market), and SOFOLES (special purpose financial companies for low and medium-income housing, 16 percent of the market). Due to its characteristics, most of mortgage credit is obtained through official procedures.

Mortgage products offered in México by Banks and Sofoles can be classified in three broad categories depending on the type of interest rates. The first and most common is the one that consists on a fixed interest rate throughout the time span of the credit. The second category consists of variable interest rate mortgages. The most commonly used reference for this type of mortgages in Mexico is the one month interbank rate (28 day TIIE) and usually minimum and maximum interest rate levels are specified. Finally, the third category is a mixed scheme that usually consists on a fixed rate during the first years of the credit and a variable rate during the following years. Table 3 describes the main characteristics of mortgage instruments offered in Mexico. Due to market conditions, the most used mortgage instrument is a fixed rate loan with a 15 year maturity, although it is becoming more common to have fixed rate period (five years usually) and then becoming a flexible interest rate instrument.

Table 3

Mortgage instruments main characteristics

Financial intermediary	Instrument	Maturity	Down payment
Infonavit	Fixed rate but indexed to the minimum wage	30 years	Savings used as down payment
Commercial banks	Fixed rate	5 to 20 years	Median of 20%
	Variable rate		Min. 5%
	Mixed rate		
Sofoles (Non-bank banks)	Fixed rate	5 to 25 years	Median of 10%
	Mixed rate		Min. 5%

Recently mortgage credit has been growing, gaining importance in the credit portfolio of financial intermediaries. Nevertheless, it still has a small level compared to a decade ago. In particular, while mortgage credit in Mexico represented 12.4 percent of GDP in 1995, by the end of 2005 it stood for 8.7 percent of GDP. The substantial drop in lending can be explained by the considerable reduction in banks' mortgage portfolio, while Infonavit and Sofoles gained market share. After the 1995 crisis most of commercial bank mortgages conditions were renegotiated and it has not been until 2003 that banks have started to increase their housing credit. Banks usually concentrated in the middle and upper income segment of the mortgage market but this has been changing specially after some structural changes in the mortgage market structure. Two issues are worth mentioning: i) some banks have acquired a Sofol and are clearly using a scheme in which the Sofol originates the credit and sells it to the bank. Under these strategy banks benefit from the infrastructure and know how of Sofoles; ii) Banks' liabilities are mostly short term deposits which implies lower cost of capital.

As mentioned before an important source of mortgage credit has been Infonavit, which is a public entity that was created in 1972. It has a tripartite governance system with equal representation of the labor unions, the employers' sector and the Federal Government. After a substantial legal reform in 1992 it became part of the public pension fund system. If a worker decides not to use his savings for a mortgage credit, the resources saved in his account can be added to his pension fund savings at retirement. Currently workers' funds for housing and for retirement are held in separate individual accounts with minimum

guaranteed returns. An important distinction of Infonavit with financial intermediaries relies on the characteristics of the loans. In the case of Infonavit the approval and amount of credit is based on a series of characteristics of the debtor (mainly the number of years in the system and the level of income). Workers are able to use the savings on their individual accounts as down payment for a mortgage. Over the last years Infonavit has incorporated flexibility in the schemes offered to workers. Nowadays a worker is able to obtain housing credit from a bank and use on bi-monthly basis his savings on Infonavit for the amortization of the credit.

The Sofoles are special purpose financial intermediaries (non-bank banks) that have been basically funded and supervised by development banks. They were introduced on 1993 but it was not until 1998 that they expanded their operations and were the most active private financial intermediaries in the mortgage market for nearly a decade. Until December 2005 they showed positive rate of growths on the mortgage credit. Currently they have shrink their balance sheets since an important amount of their new credit portfolio is sold to banks. As of March 2006, according to their assets 58.9 percent of Sofoles were oriented to mortgages.

BOX 1
The Mexican dual index mortgage

The interest rate, the maturity and the monthly payment define a mortgage. In the most traditional mortgage instruments these parameters are fixed. There are many different mortgage schemes in which a pair of these parameters are variable; the most common are variable interest-variable payment mortgages. Also there are level-adjusted mortgages that basically construct a traditional mortgage using a unit of account that is indexed to the CPI; so that both the payment and the interest vary in nominal terms according to inflation but they are fixed in real terms. Another possibility is to make the maturity also a variable of adjustment.

In Mexico in the middle of the 1980s a special kind of mortgage began to be used. Basically it was a variable interest rate-variable maturity mortgage. The payment was fixed using a wage index or the CPI; that is, the payment was constant measured in units of wages or in real terms. Any payment that was currently due, in excess of the payment linked to the wage index, was added to the mortgage balance and rolled over for further payment. The mortgage contracts actually specified a maturity, but nothing could assure that at the end of the period the mortgage balance would be fully paid. For this reason, the possibility of additional years was usually in the contract. The evolution of the Mexican mortgage depends crucially on the ratio of two indexes: the interest rates and the wage index to which the payment was linked. There were many variations of these types of mortgages in Mexico. We will use a simplified version to explain its main characteristics.

The Mexican mortgage started by fixing an initial payment. Given the income of the borrower, the payment was fixed so that the payment to income ratio within certain range (say, 25% of income). The contract also specified the ratio of initial payment to total credit, this usually took the form of a fixed amount per each $1,000 pesos of loan. For example, if the fixed amount was $9 pesos, then the initial ratio of payment to loan value would be 0.009, so that the first payment on the mortgage was given by:

$$P0 = f\,S0 = 0.009\,S0 \qquad (1)$$

Where P0 is the payment, S0 the outstanding mortgage balance (both at time 0), and f is the initial payment to loan value ratio. The payment evolved along with an index, say, the minimum wage index.

$$P_t = fS_0 \prod_{j01}^{t} (1 + w_j) = fS_0 \prod_{j01}^{t} (1 + \pi_j)(1 + \omega_j) \qquad (2)$$

Where w is the rate of rise of the minimum wage, π is the inflation measured by CPI, and ω refers to the rate of change of the real wage. The outstanding balance at time t then becomes

$$St = St\text{-}1\,(1+it)\text{-}Pt \qquad (3)$$

Where it is the interest rate which was defined as the maximum from among a basket of short term interest rates. The outstanding balance would decrease if the payment at time t (Pt) was enough to cover the interest (itSt-1) of that period. The mortgage was constructed so that it gave extra financing in times of inflation (or high interest rates), as a mechanism to solve the tilt problem.

The characteristics of the Mexican mortgage implied that negative amortization could exist.

Finally, another possibility is that instead of adjusting the maturity there can be an insurance fund that can absorb the variations in the wage or inflation index. This can be done by offering an inflation-minimum wage swap.

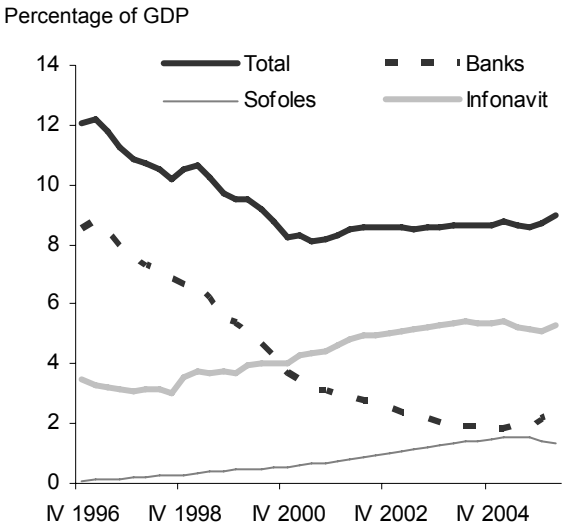
After revising the behavior of the main players on the mortgage credit market is important to analyze the different characteristics of mortgages instruments. The existence of fixed rate mortgages contrasts with conditions prior to the 1994 crisis, where the most common instrument was the double indexed mortgage (a variable rate mortgage indexed to the CPI or the minimum wage). Box 1 contains detailed information on characteristics of the mortgage

originated in the early 90s. Similar instruments are still in use by Infonavit and some public sponsored housing programs.

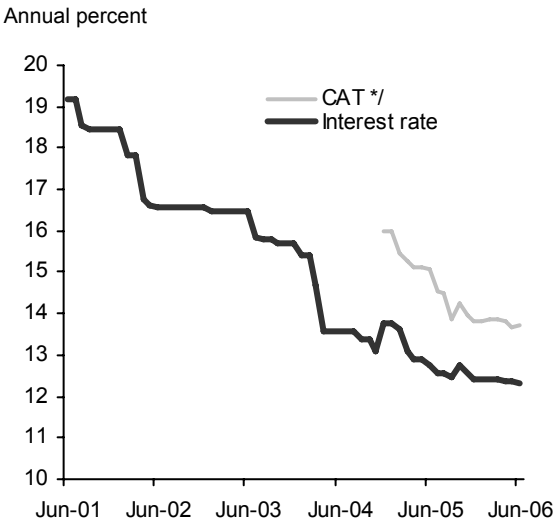
Nowadays it is possible to sign a mortgage under different conditions, thus the effective interest rate paid after considering cost associated with mortgages differs from the nominal interest rate. In order to assist borrowers to decide for the most adequate alternative, Banco de México has issued an specific methodology to take into account the different cost attached to the mortgage. These indicator is known as the CAT (total annual cost), and not only adjust the effective rate according to maturity but also from several items charged by the bank like commissions and insurance payments. Nominal interest rates charged by major commercial banks for a fixed-rate mortgage loan have decreased around 450 basis points since 2002 (Figure 7). However, there is an spread of 250 basis points between the nominal interest rate and the CAT. Nevertheless, even when interest rates in the Mexican mortgage market have dropped, they are still high. In countries which have similar inflation rates as Mexico, the mortgage rates are around seven percent. On average, the nominal interest rate charged on a new mortgage by private intermediaries (Banks and SOFOLES) was 12.93 percent in June 2006, and, considering additional costs, the CAT was 15.41 percent. However is important to mention that quality on mortgages loans has also increased, past due loans as percentage of total loans are at their lowest levels (Figure 8b).

Figure 7

a. Mortgage credit



b. Mortgage interest rates



*/ Indicator of all commitments, future or existing agreed upon by the creditor and the borrower including interest rates, commissions, obligatory insurance and other charges due to financial services. The nominal interest is the average of credits in pesos granted during the period.

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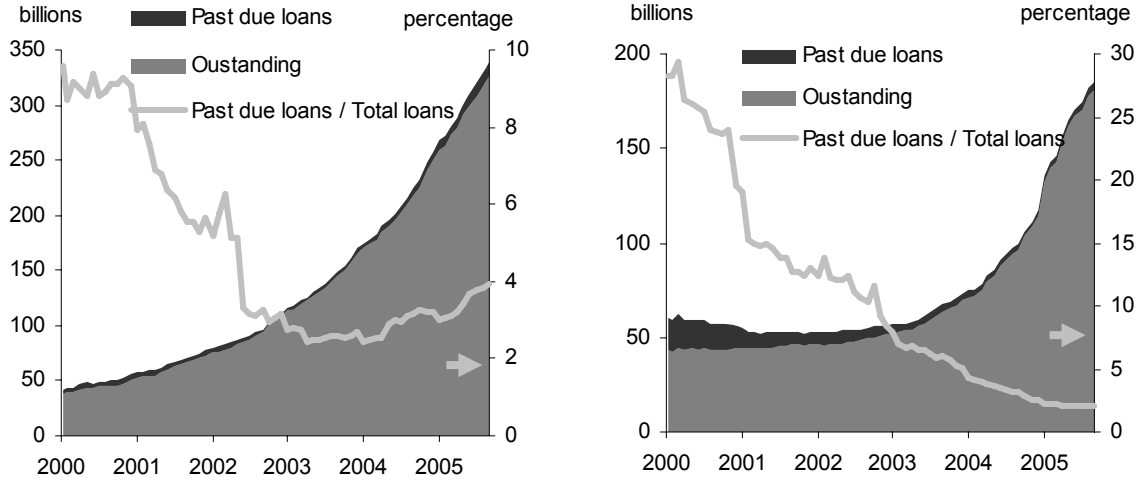
In addition to the reduction of the implied cost on mortgages and the increase in credit supply, the government has been implementing several actions to foster housing financing. In Mexico the real part of mortgage interest payments can be deducted from personal income taxes. The deduction of real interest was introduced in 2003 having the purpose to give an impulse to the construction activity that is regarded as a major employment provider.

Figure 8

a. Commercial banks consumer credit **b. Commercial banks mortgage credit**[1]



[1] Corresponds to direct credits. Does not include debtor relief programs.

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Futhermore, the government has been promoting the expansion of money markets. As a result of a more developed domestic financial system, financial intermediaries are now able not only to obtain funds at a reasonable cost but also to securitize a wide range of assets. In Mexico securitization of mortgages began in 2003. In particular mortgage Sofoles have started to securitize some part of their loans. These instruments have allowed the Sofoles to boost their credit origination without unnecessarily increasing their funding needs, as they are able to expand the rotation of their credit portfolio. In this front, the mortgage development bank (Sociedad Hipotecaria Federal, SHF) has made a significant contribution by standardizing credits and developing a credit insurance industry, which are essential to foster a mortgage-backed securities market.

5. Household financial savings

5.1 The measurement of the financial savings of households

As stated before, using Banco de México data is possible to distinguish financial intermediaries operations with all economic sectors. Financial intermediaries' information can be used to construct households' main financial savings. Therefore, as long as it is possible to identify the sectoral counterparts of financial intermediaries' transactions it is possible to follow up households positions.

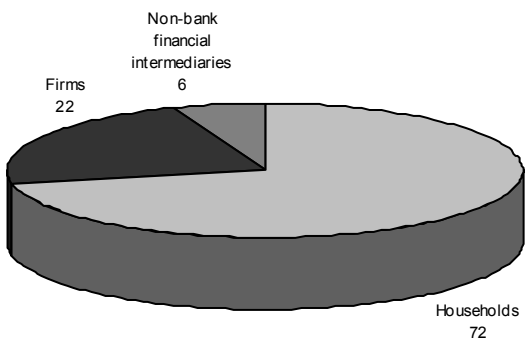
Different presentations can be made of households' financial savings. In particular we have decided to present the division by instrument so that we can easily compare this data in the context of the monetary aggregates and flow of funds accounts. Additionally, households financial savings can be presented by financial intermediary, this approach is possible through the financial surveys presentation. Actually Banco de México is in the process of publishing the financial surveys by financial intermediaries and for the consolidated financial system. We believe that this is a complementary point of view that by itself represents a valuable analysis and it is not included in this document.

The measurement of households' financial savings is based on the sectoral disaggregation of M2 (domestic financial savings by private sector residents). Basically two broad sectors are identified, non-financial corporations and households, in addition a part of financial savings is classified as belonging to non-bank financial corporations. The latter basically refers to insurance companies investments in domestic financial instruments. Household sector accounts for the majority of domestic financial savings (72 percent) while firms participate with 22 percent of the total. Furthermore, households' financial savings have been increasing and have a more cyclical behavior while firms' savings have remained fairly stable around 10% of GDP (Figure 9).

Figure 9

a. Sectoral disaggregation of M2

Percentage of total



b. Sectoral disaggregation of M2

Percentage of GDP

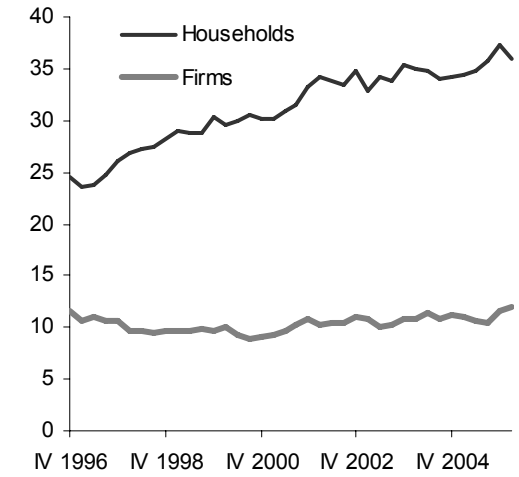


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Table 4 reports the structure of households' financial savings. Special mention deserves the two main components, that is deposits and the holding of securities. Deposits are obtained directly from banks' detailed information as reported to financial authorities. The deposits item also includes those made in the Savings and Loans Companies (Sociedades de Ahorro y Prestamo) but account for a very small proportion of total deposits.

The holding of securities is obtained indirectly through the balances of investment and retirement funds (Siefores). Also it is important to notice that in Mexico repo transactions implies the legal ownership transfer of the instrument, so that usually financial intermediaries report the holding of securities (debt instruments) including the purchases through repos. This indirectly affects the composition of financial savings (between banks deposits and holdings of securities), but not the total amount.

5.2 The evolution of financial savings

As stated earlier, financial savings have been increasingly supported by more stable macroeconomic conditions and by institutional changes related to the pension funds schemes. As a result, most of financial savings of residents comes from households (M2 households). It is important to mention that the public pension funds account now days for resources that represent 12 percent of GDP (Figure 9). This is the result of the high growth rates of pension funds (Siefores) and housing funds (Infonavit and Fovissste) related to the Public Fund System (Sistema de Ahorro para el Retiro, SAR). In 2005 Siefores presented an average annual real

growth rate of 16.1 per cent, driven by annual contributions of 102.9 billion pesos. Meanwhile, at the end of 2005 Infonavit´s savings stock amounted to 317.7 billion pesos and showed a significant annual real growth rate of 10.9 per cent.

Table 4

Household sector financial savings in Mexico

	Total	Percentage of total securities					
	Billion pesos	Currency outside banks	Deposits[1]	Total debt	Public debt	Private debt	Housing funds[2]
1997	831.3	11	55	20	16	4	14
1998	1,088.9	11	49	28	24	4	12
1999	1,400.1	12	42	34	31	3	12
2000	1,652.3	11	36	40	36	4	13
2001	1,926.5	10	31	45	41	4	14
2002	2,174.9	11	28	48	43	5	13
2003	2,433.8	11	28	46	40	6	14
2004	2,644.8	11	30	44	38	6	14
2005	3,123.9	11	28	47	41	6	14

[1] Includes deposits in domestic banks and in savings and loans companies. [2] Includes Infonavit and Fovissste.

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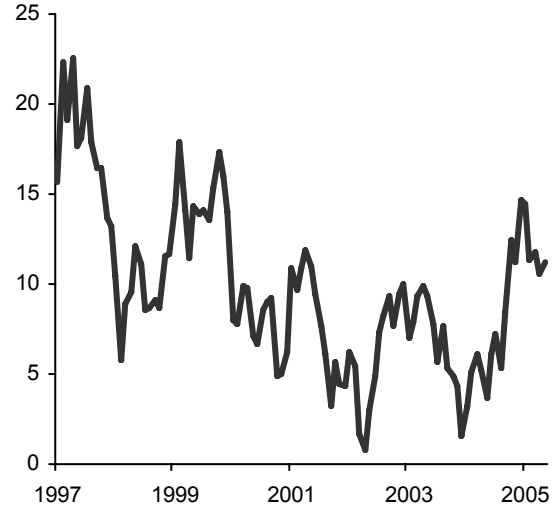
Figure 10

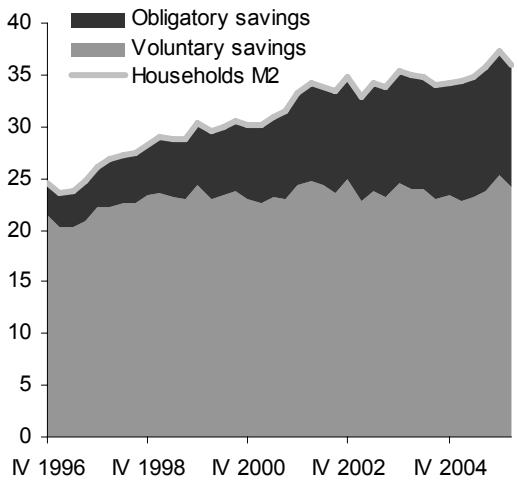
a. Households M2

Annual real percentage change



b. Households M2

Percentage of GDP



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One of the major institutional changes was in 1997 when the pension system changed from a pay-as-you-go to a fully funded social security system. Pension savings are based on obligatory contributions both by workers and employers. There are 35 investment funds specialized in retirement savings. Workers can change from one investment fund to another but there are still certain restrictions, and commissions are still high (system average of around 2.6% of the stock on annual basis). Also important are the savings in the mortgage oriented public entities (Infonavit and Fovissste) which were explained before.

On the other hand, concerning voluntary savings two financial intermediaries stand out: commercial banks as the primary recipients of households savings and other investment funds that had registered an impressive growth in the last years. While investment funds started operations on 1950 it was until 1998 that they began to expand their operations substantially. Investment funds represent an easy access alternative for non sophisticated investors. Their objective is to merge a pool of investors according to a specific investment portfolio that satisfy specific risk requirements. Since the amount required to participate on Investment funds is lower than the required to directly invest on the money and capital markets, it has been an attractive alternative for household investments.

Investment funds offer their products to households and to enterprises, the latest generally invest their pensions funds related to workers. Investment funds are divided on four groups according to the economic sector they specialize on: capital markets; restricted to households; restricted to enterprises; and, mixed (which can serve both households and enterprises).

The expansion of the investment funds related to the household sector has been remarkable. In March 1998 their assets represented 2.6 percent on GDP while in March 2006 this figure amounted to 5.3 percent of GDP. Its expansion has also been observed in the number if investment funds available in the market, in December 1996 there where only 112 investment funds whereas in March 2006 there were 360 of them serving more than 1.2 million of investors.

6. The financial position of the household sector

We believe that in order to correctly measure the financial position of the household sector in a consistent way it is necessary to make the sectoral disaggregation of the total uses and sources of financial resources of the economy. In our perspective, this is the only way in which measurement of the total position of the different sectors can be coherently presented. Using Banco de México information explained on section 3 we were able to identify these sectoral positions. The exercise allows for the verification of the different financial aggregates and substantially facilitates the presentation of the different statistics by financial intermediaries and by instruments. Table 5 reports the overall uses and sources of financial resources for the Mexican economy.

Although there has been an important expansion of credit to households, the public sector, including the Central Bank and local governments, still accounts for more than 66 percent of total financial resources. In particular, households receive less than 25 percent of domestic financial savings. Consumer credit accounts for less than a third of credit to households and mortgage credit represents a similar amount to that of international reserves of the Central Bank. Firms are still the main recipients of financial resources in the private sector and still have an external financial position of relative importance (44 percent of total firms' financial liabilities).

Table 5

Sectoral disaggregation of the sources and uses of financial resources in Mexico

Stocks

	2005		
	Billion pesos	**% GDP**	**% Structure**
Total sources	**6,180.3**	**73.8**	**100.0**
M4 (Domestic financial assets)	4,528.1	54.1	73.3
Held by residents	4,374.0	52.2	70.8
Households	3,123.9	37.3	50.5
Other sectors	1,250.1	14.9	20.2
Held by non-residents	154.1	1.8	2.5
Net external financing	1,652.2	19.7	26.7
Public sector[1]	1,054.7	12.6	17.1
Commercial banks[2]	27.5	0.3	0.4
Private sector[3]	570.0	6.8	9.2
Total uses	**6,180.3**	**73.8**	**100.0**
International reserves[4]	730.3	8.7	11.8
Public sector (PSBR)[5]	3,255.0	38.9	52.7
Domestic financing	2,200.3	26.3	35.6
External financing	1,054.7	12.6	17.1
States and municipalities[6]	132.4	1.6	2.1
Credit granted by financial intermediaries[6]	114.1	1.4	1.8
Debt issues	18.3	0.2	0.3
Private sector	2,334.1	27.9	37.8
Households	1,044.6	12.5	16.9
Consumer credit	316.9	3.8	5.1
Mortgage credit[7]	727.7	8.7	11.8
Firms	1,289.5	15.4	20.9
Credit granted by financial intermediaries[6]	553.5	6.6	9.0
Debt issues	166.0	2.0	2.7
External financig	570.0	6.8	9.2
Other net concepts	–271.5	–3.2	–4.4

[1] Includes net external indebtedness of the Federal Government, public enterprises and institutions, and external PIDIREGAS, as reported by the Ministry of Finance (SHCP). [2] Commercial banks' external liabilities. Excludes non-residents' bank deposits. [3] Includes loans and securities issued abroad by the private sector. [4] As defined by Banco de México's Law. [5] Borrowing Requirements Historical Balance of the Public Sector (BRHBPS), as reported by Ministry of Finance (SHCP). [6] Includes total credit portfolio from financial intermediaries and portfolio related wiht debt-restructuring programs. [7] Includes total credit portfolio from financial intermediaries and portfolio from National Employees' Housing Fund (Instituto Nacional del Fondo de Vivienda para los Trabajadores, INFONAVIT). Includes portfolio related with debt-restructuring programs.

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Table 6 presents the households' total balance sheet combining the information on their assets and financial liabilities analyzed in the previous sections. On the asset side an estimation of housing and durable goods wealth is reported. These estimations were constructed using a perpetual inventory method and national accounts data. In the case of housing it refers to the value of the structures and does not include an estimate of the value of land. The value of housing wealth represents 76.9 percent of GDP, a relative small figure compared with developed economies where the housing stock reaches 90 percent of GDP. Also important is that net housing equity, value of the housing stock net of mortgage credit, represents more than half the GDP. In addition, an estimate of households' equities holdings is reported. This is constructed by deducting from total market capitalization the equities holdings of non- residents and financial intermediaries.

Finally, total financial assets of households, considering residents' stocks holdings, amount to 66.8 percent of GDP (36.5 percent of GDP without equities). It is important to mention that the observed expansion on savings mostly reflects the compulsory savings of the pension system. The most important component of financial savings is the holding of securities, either directly or through the pension and investment funds.

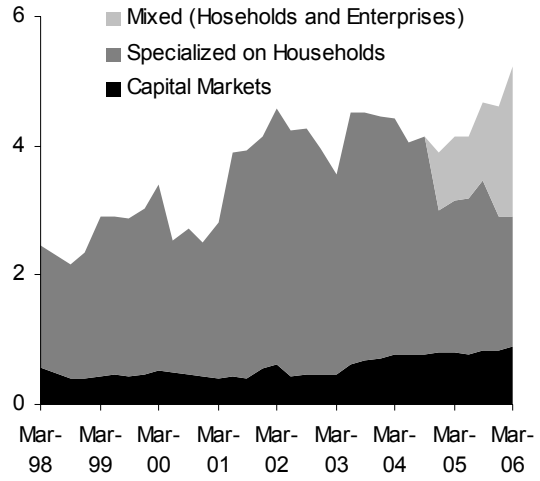
Financial liabilities of households amounted at the end of 2005 to around 13 percent of GDP. Although mortgage credit represents 67 percent of total liabilities, it is credit to consumption the one with the most important increase. In particular, the role of banks in the market of credit to consumption stands out. Households are becoming the most important sector in banks' balances.

The total net creditor financial position of households in 2005 represented more than half of GDP if residents' stocks holdings are included. If the latter is not considered then the financial position is around 23 percent of GDP (Figure 11). It is important to notice that long term savings invested in the pension funds represented around 12 percent of GDP. These are not liquid accounts and there is evidence that workers still consider these resources as contingent, specially the ones related to the pension funds. Without these long term deposits, and not considering equities, the net financial position of households diminishes to 11.5 percent of GDP, a figure slightly below the one observed in 2000 (13.4 percent of GDP).

Figure 11

a. Investment funds assets

Stocks as percentage of GDP



b. Investment funds

Number of funds by type

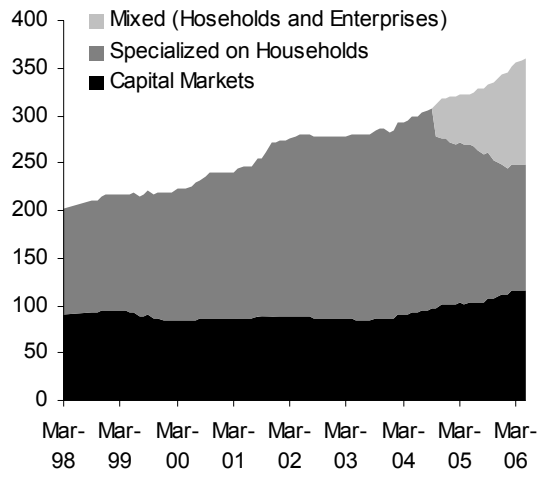


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Table 6

Household balance sheet

Percentage of GDP

	Dec-00	Dec-05
Total	**147.8**	**169.2**
Total real assets	**96.7**	**102.4**
Housing[1]	75.4	76.9
Durable goods	21.3	25.5
Financial assets	**51.1**	**66.8**
Financial savings	**30.0**	**36.5**
Deposits in financial intermediaries	10.7	10.5
Securities	11.9	16.8
Public	10.6	14.7
Private	1.3	2.1
Housing funds[2]	4.0	5.2
Currency outside banks	3.3	4.0
Equities	**21.1**	**30.2**
Financial liabilities	**9.6**	**13.0**
Consumption	1.4	4.3
Banks	0.9	3.3
Sofoles[3]	0.2	0.4
Department stores	0.3	0.6
Housing	8.2	8.7
Banks	3.7	2.2
Sofoles[3]	0.5	1.4
Infonavit[4]	4.0	5.1
Memoranda items		
Total net financial position	41.5	53.8
Total public pension funds[5]	7.0	12.0
Net financial position excluding equities and public pension funds	13.4	11.5
Net housing wealth	67.2	68.2

[1] Value of housing stock structures, does not include the value of land. [2] Mainly contributions to Infonavit and Fovissste. [3] Special Purpose Financial Companies (Sociedades Financieras de Objeto Limitado). [4] National Employees' Housing Fund (Instituto del Fondo Nacional de la Vivienda para los Trabajadores). [5] Includes housing and retirement funds.

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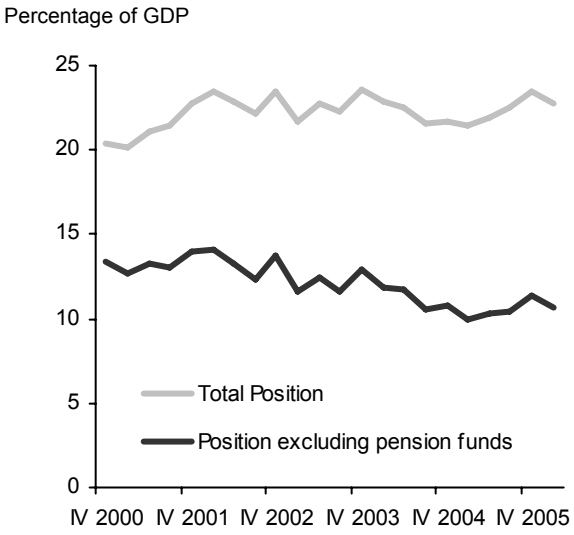
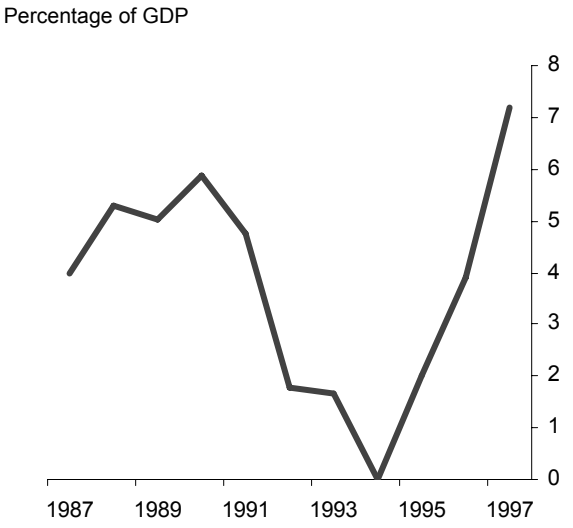
Once the size of the financial position of households can be measured it is possible to evaluate the impact of the current credit expansion. For the period 1991-1996, we do not have yet the data required to construct households' net financial position, however an indicator can be calculated using bank deposit data and making some assumptions on the holdings of securities. This broad indicator shows that during this period households nearly reached a net debtor position. This contrasts with the current situation where the household sector has a net creditor position of around 23 percent of GDP. It is clear that although households' liabilities are growing rapidly, at a rate faster than that of their income, the net financial position is very different from that observed previous to the 1995 crisis. Nevertheless, it stands out that at that time households' net financial position decreased substantially in just a few years, basically explained by an enormous increase in their liabilities.

Figure 12

a. The net financial position of households 2000-2006



b. Indicator of households net financial position 1987-1997



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7. Final remarks

In Mexico, macroeconomic stability has allowed for a deepening of financial markets. Households have benefited from this context by having access to an increased availability of financial resources and with better conditions. However, macroeconomic changes could highly impact households' financial position. Additionally, even when current performance of banking loans is at sound levels a close follow up should be made by financial authorities. It is clear that households are having a bigger participation in financial intermediaries' balances (both in their liabilities and asset sides).

There is an increasing need to understand the macroeconomic implications of this cycle. In this paper we provide a methodology to measure the household sector position in Mexico using public available data, as far as we have knowledge this is the first paper on this topic. This methodology allows the understanding of the interaction of the household sector with financial intermediaries.

Even when the particular high expansion of credit to households has not been reflected in a deterioration of their financial position, other episodes in our recent history tell us that there can be an important deterioration in households' financial position in a relative short period of time. Although the net financial creditor position of Mexican households is still large with respect to its income, an important part is explained by the long term financial savings. Institutional changes have played an important role in fostering financial savings of the household sector. The transition to a fully funded social security system stands out as the most relevant factor to explain the increase in savings. So it is important to notice that without these long term deposits the net financial position of households diminishes substantially. Finally, future research on household sector financial position should focus in the analysis in the imbalances in assets and liabilities by income brackets.

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Financial margins in Norwegian households - An analysis of micro data for the period 1987-2003

Bjørn H Vatne[1]

Financial margins are defined as households' liquid assets after borrowing costs and ordinary living expenses. This is an indicator of how robust the debt situation in a household is to a change in economic conditions such as an increase in interest rates or lower income. Thus, financial margins can give information concerning the risk of default on bank loans to the household sector. In this article, financial margins are calculated using micro data for the period 1987-2003.

Norwegian households' financial margins have increased substantially from the end of the 1980s to 2003. The reason for this is strong growth in household income, at the same time as a lower share of income was used to cover living expenses and loan-related expenses. Most households have comfortable margins, but some households have small or negative margins. The share of households without financial margins has decreased over the period analysed.

1. Introduction

In evaluating the risk connected with loans from financial institutions, it is important to monitor the debt situation in the household sector for two reasons. First, a widespread failure in households' ability to service debt obligations will cause increased losses on financial institutions' loans to the household sector. Second, households in financial distress are likely to reduce their demand for goods and services. This will in turn affect the profits of firms, which may result in increased losses on bank loans to the commercial sector.

The financial margin of a household, defined as liquid assets after ordinary costs of living and interest and principle payments, can be used to shed light on both these subjects. Micro data is used to calculate the financial margins of individual households. The margins can be used in two ways. In the first part of the analysis, the sum of positive margins across households, depreciated by the consumer price index, is interpreted as the total funds available in the household sector, i.e. the total amount that may be used for consumption other than common costs of living and saving other than loan instalments. In the second part of the analysis, financial margins are used to assess how exposed household debt is to unexpected shocks. We estimate the proportion of total households without financial margins and their corresponding share of total debt. Further, we analyse which groups of households have no margins, and how the situation has evolved over the analysis period 1987-2003. Finally, we estimate the effect of an increase in the interest rate on the financial margins.

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2. Background

Why study financial margins?

Norges Bank monitors the debt situation in the household sector as a part of the surveillance of risk in financial markets. In macro studies, it is common to use total household debt as a percentage of total disposable income as an indicator of how exposed the debt of the households is to unforeseen shocks (see, for example, Chart 2.12 in Norges Bank (2006)). However, this aggregated indicator has some shortcomings. First, the income also includes income from households without debt. Second, the indicator does not take the level of income into account. Households with high income can service relatively more debt than low-income households. Third, the indicator does not reflect fundamental differences between households such as age, number of persons in the household and affiliation with the labour market.

Access to micro data allows us to calculate financial margins that reflect the financial situation in each household more precisely. The calculation of financial margins has much in common with the assessments made by Norwegian banks when they consider household loan applications. Banks base their assessments on household income. Ordinary costs of living based on the characteristics of the household are deducted. From the resulting disposable income, a maximum loan is calculated based on assumptions concerning interest rate and profile of instalments. However, there is uncertainty surrounding these calculations. Interest and instalments shall be paid over the total life of the loan. Income, costs of living and interest rates may change, affecting the household's ability to service the loan.

From the calculated margins we can identify households without financial margins. We assume that these households' financial situation is strained and that their debt is especially exposed to default. The exposed debt as a fraction of total debt is an indicator of the direct risk associated with bank loans to households. Total margins, defined as the sum of the margins in households with positive margins may be an indicator of the total demand from the commercial sector. Total demand will affect firms' income and ability to service debt.

Our hypothesis is that developments in the financial margins of households affect developments in risk associated with bank loans. The data does not have enough observations to perform a proper statistical test of this hypothesis. However, in Chart 1 we have shown this correlation graphically. The bottom graph shows the rate of default on bank loans defined as the value of defaulted loans to households and non-financial companies as a fraction of the total value of all loans. The chart indicates that there is a positive correlation between the rate of default and the financial margins of the households. There is a positive correlation between the default rates and the share of debt held by households with negative margins (exposed debt). The turning points of exposed debt seem to precede the turning points of default rates. A possible explanation is that households have financial assets that they can use before they default on their loans. There is a negative correlation between the total funds available to households and the default rate.

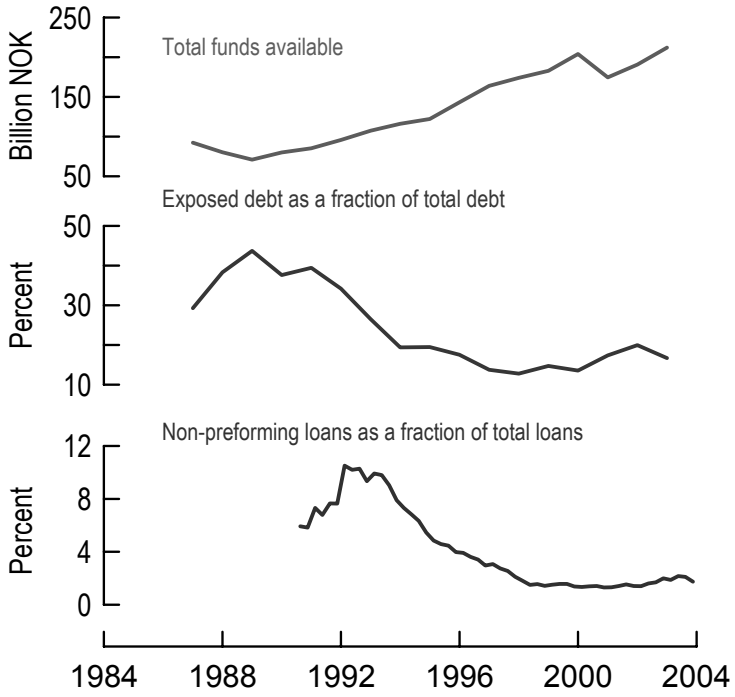
In addition, the micro data give us the possibility to analyse the distribution of financial margins over groups of households. By identifying which groups of households are most exposed we can identify causes of increased default risk at an early stage.

Other countries have conducted several micro-based studies of the debt situation of the household sector (see DWP (2004) and May et al. (2004)). The analyses in these papers are in line with the work done by Sveriges Riksbank (2004, 2005) and BIS (2006). In this analysis, households are divided into five equal sized groups according to income, and their debt and financial margins are evaluated. The main conclusion is that the high level of debt in the household sector does not pose a major threat to banks. This is because the loans in Sweden are concentrated among high income groups. These groups also have the highest margins and most of the financial assets. We roughly compare our findings with these results.

Chart 1

Development in total fund available, exposed debt and banks' non-performing loans

Billion 2003-NOK and per cent



Source: Statistics Norway, SIFO and Norges Bank.

Data

The micro data used in this paper are from the Income and Property Statistics for Households 1987-2003 gathered by Statistics Norway (see NOS D310 (2004)). The data provide information on households' average income, income composition and distribution, and similar information about property. The statistics are based on material from the Income Distribution Survey, which is a representative sample survey. The information is based on tax returns for all household members and additional information on tax-free income from a number of public registers. There is reason to believe that households tend to under report figures that are taxable and over report data that result in tax-deductions.

The households in this analysis are limited to households where salary is the main source of income, "Employees". Self-employed households, where the net entrepreneurial income exceeds salary is excluded from the data set. In these households, we cannot isolate the household economy from the economy of the firm. Pensioners and insurance recipients have an income below the standard social benefits. These households are also excluded from the dataset. Students are mainly included in this group. Student loans are reported as debt, but are mainly used to cover living expenses.

60 per cent of the observations are employees. In the beginning of the period, there are roughly 2 200 observations of employees. At the end of the period, there are 10 000 observations. Due to the lower number of observations at the beginning of the period, there is more uncertainty connected to the estimates of the earlier years.

The data include, in addition to economic data, information about the characteristics of each household, such as age and the number of persons in the household. Based on this

information, we can calculate common living expenses from the Standard Budget developed by National Institute for Consumer Research (SIFO (1987-2003)). The judgement of what is a necessary level of consumption will vary from household to household, and with geographic location.

The tax returns data include information on paid interest, but not on instalments. Instalments are calculated by assuming linear repayment over 20 years. It is possible to negotiate a longer period of repayment and annuity loans or exemption from repayment.

The economic setting

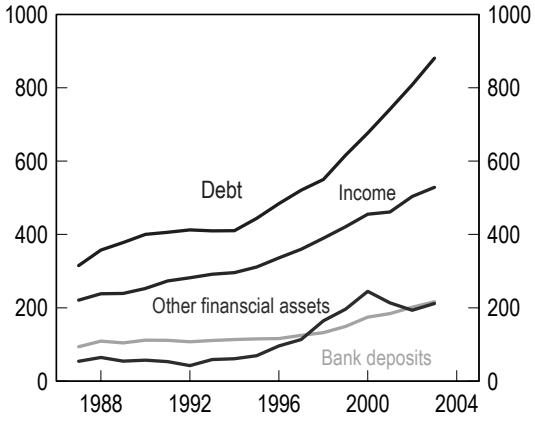
The fundamental economic variables of this analysis are income after tax, debt, bank deposits and other financial assets. Developments in these variables in fixed prices are shown in Chart 2. Total household debt has increased by about 80 per cent in the period 1987-2003. Income has shown a weaker development. The average interest rate on loans to households has decreased by ten percentage points over the period. In 2003, the interest rate was around 6 per cent (see Chart 3). See Norges Bank (2006) and Riiser and Vatne (2006) for a general description of the financial situation in the household sector.

In this analysis, financial assets are divided in two components, bank deposits and other financial assets. In 2003, roughly half of the total financial assets were deposits. Growth in deposits has been weaker than growth in total debt. Thus, debt is secured in deposits to a lesser degree in 2003 than in 1987. The tax value of other financial assets has grown rapidly and faster than debt in the period. Of other financial assets, 60 per cent represents unlisted securities and other outstanding claims. This portion of financial assets is more sensitive to market fluctuations and is less liquid than deposits. Thus, the extent to which these assets can serve as a buffer when households face debt-servicing problems is uncertain.

Chart 2

Total value of debt, income and financial assets

Billion 2003-NOK. Employed. 1987-2003

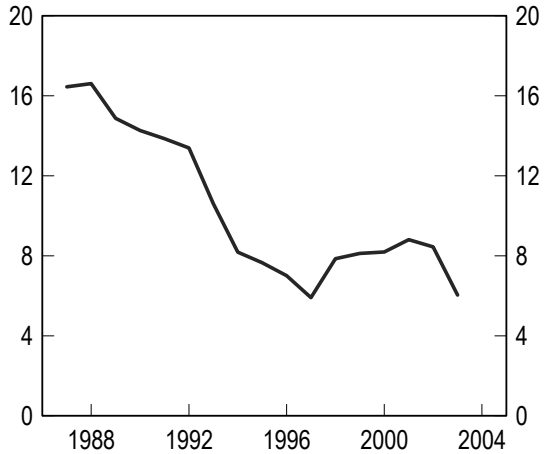


Source: Statistics Norway and Norges Bank.

Chart 3

Banks average interest on loans

Per cent. 1987-2003



Source: Norges Bank.

Financial margin - definitions

In Table 1, the different types of margins that are used in this analysis are defined on the basis of the components that are included. Margin after consumption is defined as income after tax less common living expenses. We get margin after interest if we in addition deduct paid interest. Margin after instalment, which is the benchmark, includes repayments. In the two last definitions, bank deposits and other financial assets can be used to cover the expenses of the households.

Table 1

Financial margins

Average. NOK 1000. 2003

		Income after tax	Bank deposits	Other financial assets	Ordinary living expences	Interest paid	Down payments
Margin	**Average NOK 1000**	425	174	170	182	43	35
Margin after consumption		+			–		
Margin after interest		+			–	–	
Margin after instalment		+			–	–	–
Margin with bank deposits		+	+		–	–	–
Margin with financial assets		+	+	+	–	–	–

Source: Statistics Norway, SIFO and Norges Bank.

3. Household financial margins

Total household margins have increased over the period analysed

In Chart 4, total household income after tax is decomposed after costs and margin after instalments. The numbers are deflated by the consumer price index to reflect the development in purchasing power. In 1987, the margin after instalments was 24 per cent of income. In 2003, this ratio rose to 39 per cent. The reason for this is that total household income has increased by 53 per cent in the period. The share of income used for normal living costs is reduced from 51 to 43 per cent. The cost related to debt is reduced from 25 to 18 per cent. Total household purchasing power increased from 83 to 205 billion 2003-NOK.

Chart 5 shows developments in the total funds available to households when we include financial assets. If we include all financial assets, total funds available have doubled. Financial assets' contribution total funds available were reduced from 74 to 68 per cent. In 1987, half of the available funds were bank deposits, and other financial assets represented about one-fourth. In 2003, bank deposits and other financial assets both amounted to about one-third. In other words, the share of bank deposits has fallen while the shares of less liquid and more volatile assets have increased.

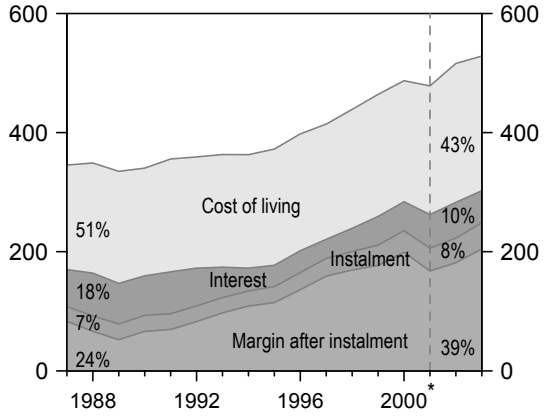
The distribution of financial margins across households

In general, the financial situation of Norwegian households is solid. In 2003, more than half of the households had a margin after instalments of more than NOK 100 000 (see Chart 6). 16 per cent of the households had a margin between 0 and NOK 50 000, while 13 per cent of the households had no margin. The debt of households without margins is especially exposed to increases in interest rates and reduction in income.

Chart 4

Income after cost and margin

Billion 2003 NOK. Per cent of income. 1987-2003



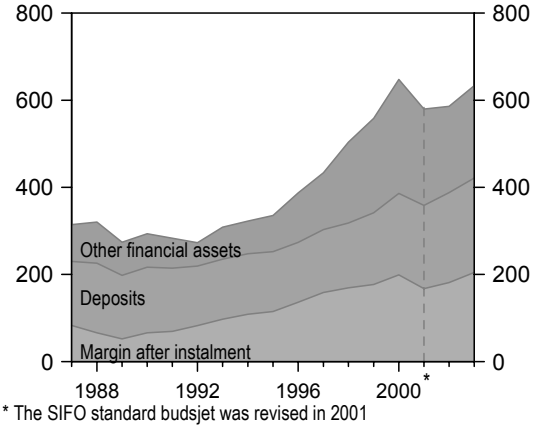
* The SIFO standard budsjet was revised in 2001

Source: Statistics Norway, SIFO and Norges Bank.

Chart 5

Total funds available included financial assets

Billion 2003-NOK. 1987-2003



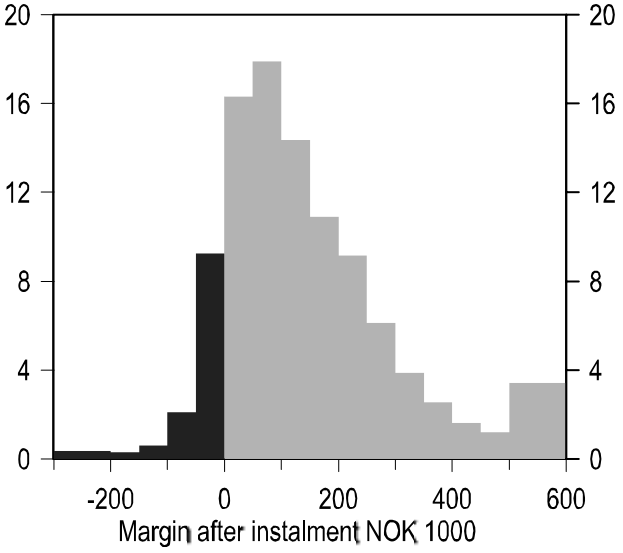
* The SIFO standard budsjet was revised in 2001

Source: Statistics Norway, SIFO and Norges Bank.

Chart 6

Households over margin after instalment

Per cent. 2003



Source: Statistics Norway, SIFO and Norges Bank.

4. Debt held by households without financial margins

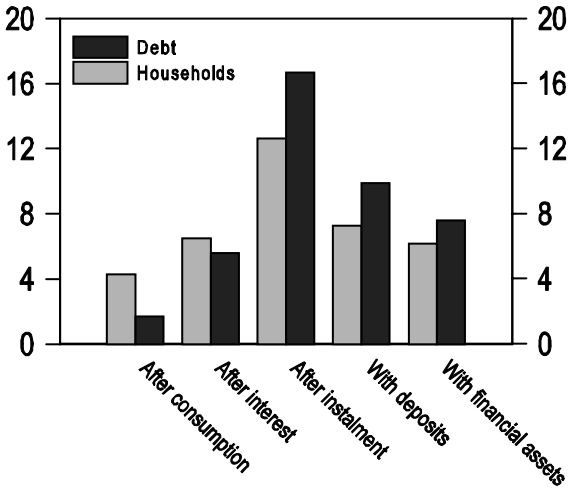
One-sixth of total debt was held by households without margins after instalments

The size of the financial margin is an indicator of how robust households are to unforeseen negative events in income or costs. Chart 7 shows the percentage of households without financial margins under the various definitions of financial margins, and the share of total debt that these households held in 2003. Less than 2 per cent of a total debt of about NOK 900 billion is held by households that do not have enough income to cover living expenses. The share increases to 6 per cent if interest is included. Households without margins after instalments held 17 per cent of total debt. If we include financial assets in the liquid assets of households, the share of debt held by households with negative margins is reduced substantially.

Chart 7

Percentage of households without margins and corresponding shares total debt

Per cent. 2003



Source: Statistics Norway, SIFO and Norges Bank.

In the rest of this paper, we focus on margin after instalments, which we denote as financial margin. Households without financial margins have several options to avoid defaulting on their loans. They can negotiate lower principal payments, they can reduce their consumption or they can use their financial reserves. Thus, negative margins do not necessarily increase the risk of default.

The main difference between households with and without financial margins is their average net income. This is shown in Table 2. Roughly speaking, the strained financial situation in these households is more often due to low income than high cost of debt.

Households with low and middle income hold most of the exposed debt

In Chart 8, we examine the connection between exposed debt and income level by dividing the households into five equal-sized groups according to net income. The share of exposed debt is highest in the low-income groups. The 20 per cent of households with the highest income holds around one-third of total debt, but only 7 per cent of exposed debt. The two lowest income groups hold 23 per cent of total debt, but 60 per cent of exposed debt. In the lowest income group, more than half of the total debt is held by households without financial margins.

Table 2

Decomposition of financial margin

Average. NOK 1000. 2003

	Income	Cost of living	Instalment	Interest	Margin
Positive margin	454	184	34	41	195
Negative margin	225	169	47	55	–46
Difference	229	15	–13	–14	241

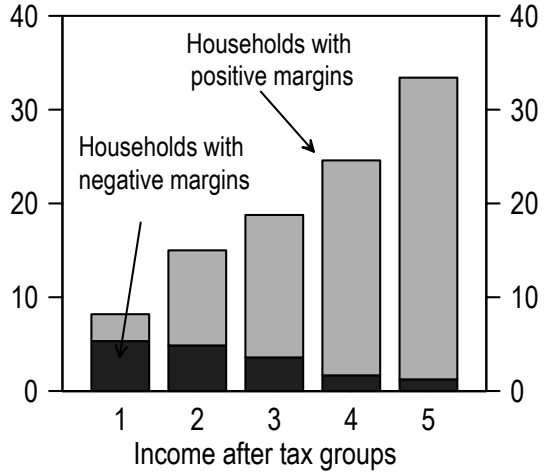
Source: Statistics Norway, SIFO and Norges Bank.

Chart 9 shows developments over time. The two groups with the highest income have reduced their share of exposed debt. There can be two reasons for this. First, the percentage of total income earned by the lowest income group has decreased through the analysis period. At the same time, their percentage of total debt has increased. Second, the percentage of total debt held by the high income groups has decreased, partly because changes in tax rules in the 1990s made it less profitable for high income groups to hold debt.

Chart 8

Percentage of total debt after income

Per cent. 2003

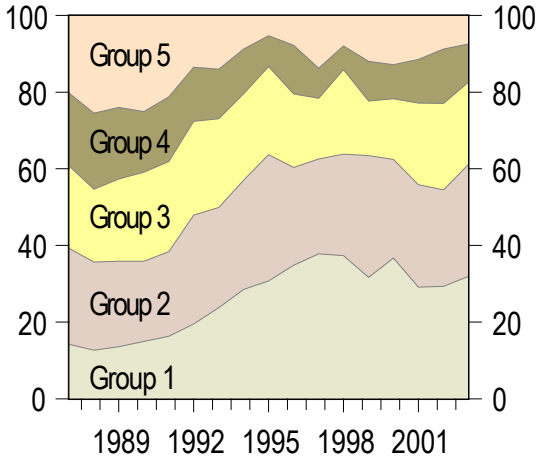


Source: Statistics Norway, SIFO and Norges Bank.

Chart 9

Debt held by households with negative margins after income

Per cent. 1987-2003



Source: Statistics Norway, SIFO and Norges Bank.

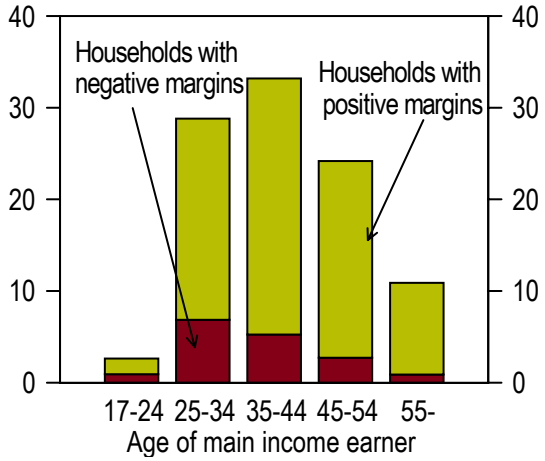
The exposed debt is concentrated in age group 24-35

Chart 10 shows the percentage of total debt by age of the main income earner and households with and without financial margin. The largest percentage of exposed debt is, as expected, held by households with main income earner in the age group 24-35. This is the age group where most first-time house buyers are found. The age group 24-35 holds near 30 per cent of total debt and more than 40 per cent of exposed debt.

Chart 10

Percentage of total debt after age

Per cent. 2003

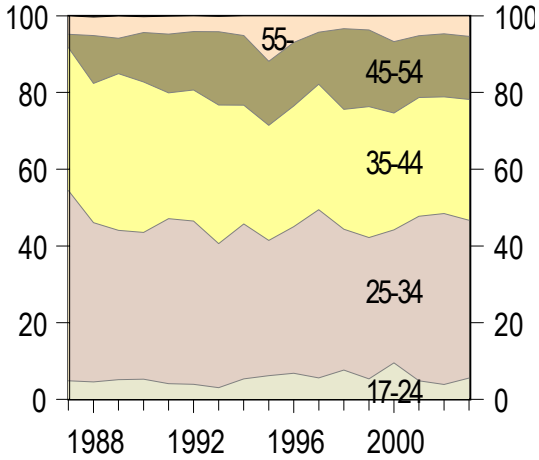


Source: Statistics Norway, SIFO and Norges Bank.

Chart 11

Debt held by households with negative margin after age

Per cent. 1987-2003



Source: Statistics Norway, SIFO and Norges Bank.

In Chart 11, we analyse the development of exposed debt by age group over time. The largest change can be found in the age group 35-44. This group held about 40 per cent of exposed debt around 1990. At the end of the period, the fraction was reduced to 30 per cent. The age group 45-54 in particular has increased their share of exposed debt. The reason for this may be the group's stronger-than-average growth in debt, and that the relative number of household in this age group has increased due to demographic effects (see Riiser and Vatne (2006)).

Is household debt more exposed in Norway than in Sweden?

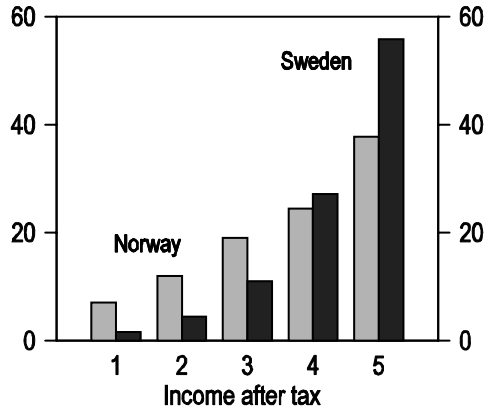
Sveriges Riksbank (2004) concludes in its analyses of margin after interest that there is little risk connected with loans to the household sector. Households in the high income groups have most of the debt, but also the highest margins due to high income and financial assets. They find that a small share (1.2%) of the three highest income classes has negative margin after interest.

Due to differences in the data definitions, the results are not directly comparable with our Norwegian findings. We find, however, in the Norwegian data that the low income groups hold a larger share of total debt than in the Swedish data sample. The two lowest income groups in the Norwegian data set hold almost 20 per cent of total debt compared to 6 per cent in the Swedish data (see Chart 12). The finding that low income groups in Norway hold a larger share of total debt than in Sweden, indicates, all else being equal, that household loans are more exposed in Norway than in Sweden.

Chart 12

Total debt after income

All households. Per cent 2001



Source: Statistics Norway, Norges Bank and Sveriges riksbank.

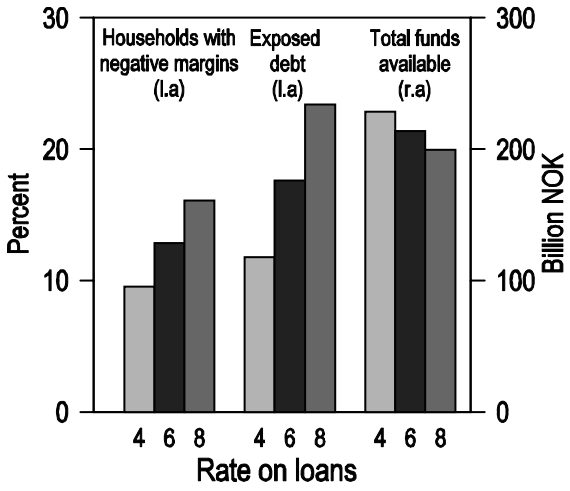
5. How do increased interest rates affect the margins of the households?

The effect of an interest rate increase on household margins depends on the fixed-interest period of loans. The majority of loans feature variable interest rates. For these loans, a change in the interest rate will have a more or less immediate effect, whereas a fixed-interest rate loan will not be affected until it is renegotiated. Banks' lending rates for household loans vary and are primarily based on the quality of the collateral. In this part of the analysis, we look at the effect of an interest rate change if all borrowers are immediately exposed to the same new interest rate. The calculated effect thus exaggerates the actual effect.

Chart 13

The effect of interest rate changes on financial margins

Per cent and billions of NOK



Source: Statistics Norway, SIFO and Norges Bank.

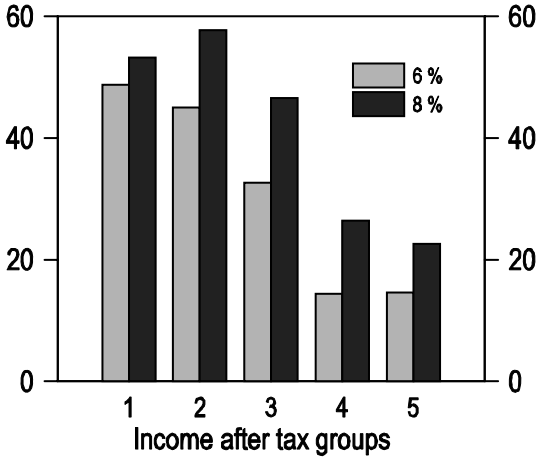
Average bank lending rates were approximately 6 per cent in 2003. Chart 13 shows the calculated effects on financial margins of a plus/minus two percentage point change in interest rate. If the interest rate is increased by 2 percentage points, the share of households with negative margins will increase from 13 per cent to 16 per cent. The share of debt held by households with negative margins will increase from 17 per cent to 23 per cent. The margins will be reduced from 214 to 200 billion 2003-kroner, a reduction of 7 per cent.

Households in the middle-income groups account for the largest increase in exposed debt (see Chart 14). Most households without financial margins after such an increase in interest rates are in income group two or three. Debt held by households in age group 25-44 is most exposed to a change in interest rate. This is shown in Chart 15.

Chart 14

Exposed debt after income

In billions of NOK. Interest rate on loans 6 and 8 per cent

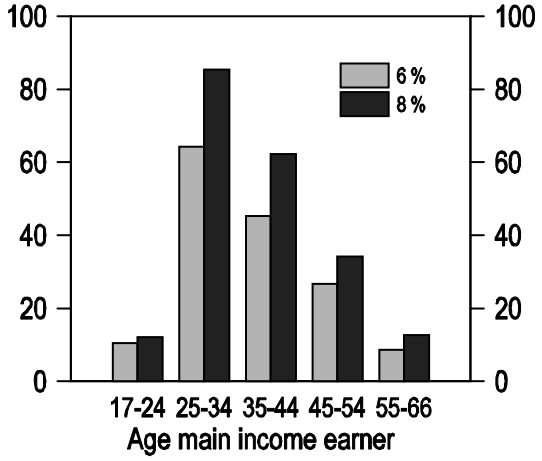


Source: Statistics Norway, SIFO and Norges Bank.

Chart 15

Exposed debt after age

In billions of NOK. Interest rate on loans 6 and 8 per cent



Source: Statistics Norway, SIFO and Norges Bank.

6. Conclusion

The total funds available in the household sector have increased in the period 1987 to 2003. The reason for this is that total income after tax has increased, and at the same time the share of income used to cover living costs and loan expenses has decreased. In addition, the increase in total financial assets has reduced household vulnerability to an interest rate increase or income reduction.

The share of total debt held by households without financial margins has decreased in the period 1990 to 2003. In isolation, this signals lower credit risk associated with banks' exposure to the household sector.

In 2003, roughly 13 per cent of households had common living expenses and interest and instalment costs that exceeded their income. These household held 17 per cent of total debt. It appears that households have no margins as a result of low income rather than high borrowing and living costs. Households with low income and young households are overrepresented among households without financial margins. The share of total debt held by these households has increased.

The effect of an increase from 6 to 8 per cent in the interest rate paid by households to banks is estimated to be an increase in the share of households without financial margins from 13 to 16 per cent. The share of total debt held by these household rises from 17 to 23 per cent. The total funds available in the household sector decreases by 7 per cent.

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Household debt, interest rates and insolvencies in South Africa

Johan van den Heever[1]

Introduction

The level of indebtedness of the household sector in South Africa has recently scaled new heights, raising interest in this aggregate and leading to concerns in some quarters regarding its sustainability and regarding the general health of household finances.

This brief note first discusses the estimation of household debt in South Africa. Secondly, it gives an outline of recent developments in the debt aggregates. An important indicator of financial distress in the household sector is the level of insolvencies of individuals and partnerships. In an attempt to capture the sensitivity of insolvencies to interest rates, a short-term empirical model is developed in the third section of the paper, linking household debt, interest rates and insolvencies. Due attention is paid to the lags involved. This is followed by a concluding section.

Estimation of household debt in South Africa

The level of indebtedness of the South African household sector is estimated by the South African Reserve Bank on a quarterly basis, and the ratio of household debt to disposable income is published in the Bank's *Quarterly Bulletin*. Data on household debt has been calculated going back to 1969.

In the absence of a regular census of household finances, South Africa relies on creditor data in order to estimate the level of household debt.

As can be seen from the accompanying table, the banking sector is by far the most important source of credit to households. In total, the banking sector was responsible for more than 90 per cent of the total household debt at the end of March 2006.

In South Africa, the banking sector is dominated by banks in the private sector, with quite limited involvement by banking institutions in the public sector. Among the banking institutions in the public sector, only the Land Bank provides significant amounts of credit to farmers, whose unincorporated businesses are classified in the household sector. The Land Bank and the private sector banks provide monthly balance sheet information to the South African Reserve Bank. This information is of good quality, with the banks taking considerable care in reporting their most detailed balance sheets. It is quite helpful that these balance sheets are disseminated per individual bank on the South African Reserve Bank's website and are analysed in great detail by numerous analysts, some of them inside the banking sector, to pick up trends and changes in market share.

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Table 1

The composition of household debt at the end of March 2006

Component	Amount R billions	Share of total per cent
Bank loans and advances to the household sector		
Mortgage advances	403	59
Instalment sale and leasing finance	112	16
Credit card advances	32	5
Overdrafts and other bank advances	80	12
Non-bank loans and advances to the household sector	54	8
Total household debt	**681**	**100**

Source: Research Department, South African Reserve Bank.

Non-bank loans and advances to the household sector are obtained from various sources. These include quarterly surveys of non-bank financial institutions conducted by the South African Reserve Bank, estimates based on information obtained from Statistics South Africa (the national statistics office) and other sources on the credit extended to the household sector by non-financial institutions such as shops, and information on microlending disseminated by the relevant regulatory authorities.

An appendix table at the end of this note summarises the sources of data for the calculation of household debt. A thorough discussion of the methodology used to estimate not only household debt but also all the other components of the household balance sheet in South Africa is contained in Aron, Muellbauer and Prinsloo (2006). For purposes of this brief exposition, only a handful of measurement issues which must be kept in mind when interpreting the level of household debt are highlighted.

Firstly, household debt by definition consists of debt incurred by the household sector. The demarcation of the household sector seems straightforward. However, it should be kept in mind that the household sector's finances can be strongly interwoven with that of the corporate sector. For instance, in South Africa many individuals choose to set up a close corporation to own their fixed property, rather than to own it directly. Should a loan be required to acquire such property, it would generally be a loan to the close corporation, which forms part of the corporate sector. However, the individual would have to pay the instalments on such loan from his or her household income, and would often also in his or her personal capacity guarantee that the close corporation will honour its commitments. Therefore, the level of debt which has to be serviced from household income may in fact be higher than the household debt. The lines of demarcation between the corporate and household sectors are clear, but users should be aware of the implications of the sectorisation framework adopted. Additional information on loan guarantees given by the household sector, and on the extent of lending to close corporations (rather than to companies) could be helpful in this regard, but are not currently available in South Africa.

Secondly, securitisation can complicate the measurement of household debt, and has gained in importance in South Africa in recent years. As mentioned above, the level of household indebtedness in South Africa is not established through a survey of households, but by surveying lenders such as banks, asking them how much they have lent to households and adding up the creditor data obtained in this way. However, securitisation frequently involves a bank which packages some of its mortgage, instalment sale or leasing advances and sells

it to a non-bank investor. Accordingly, the securitised advances disappear from the balance sheet of the banking sector. Tracking securitisation activity and obtaining appropriate information from non-bank investors can be challenging. While much refinement remains to be done, Gumata and Mokoena (2005) obtained useful data in this area, such data having been published in the December 2005 *Quarterly Bulletin* of the South African Reserve Bank. Difficulties include establishing how much of the securitised loans are loans to the household rather than to other sectors.

Thirdly, there is the issue of advances to households by insurers and pension funds. Life insurers frequently lend money to individuals against the security of life policies, with the loan usually repayable in instalments. Life insurers also extend mortgage advances. In South Africa in certain instances an employee may also borrow part of his accumulated savings from his own retirement fund to acquire fixed property. Repayments are generally made on a monthly basis at a market-related interest rate and are spread over many years, much like the repayment of a mortgage loan. While it is reasonably easy to obtain data in respect of lending by life insurers, obtaining information from the numerous retirement funds in South Africa on their loans to the household sector can be fraught with difficulties.

Finally, the microlending industry has an interesting history. This industry extended - and still extends - large numbers of small loans, mainly to individuals, at comparatively high interest rates. However, over the past decade many of the microlending organisations were acquired by banks. Most microlending is therefore now reported under *other bank advances*. The remainder is obtained from information released by the Micro Finance Regulatory Council (MFRC). The functions of the MFRC have recently been transferred to a new body, the National Credit Regulator. However, some microlending by entities that are not registered with the regulator persists. Its extent is impossible to fathom, since the lenders prefer to remain illegal and some of the borrowers using such finance are probably in embarrassing financial difficulty. Both parties are likely to refrain from providing information to outsiders.

Description of developments in household debt

Household debt is often expressed as a ratio of annualised disposable income of households. The graph below shows this ratio for South African data, covering the period from the first quarter of 1969 to the first quarter of 2006.

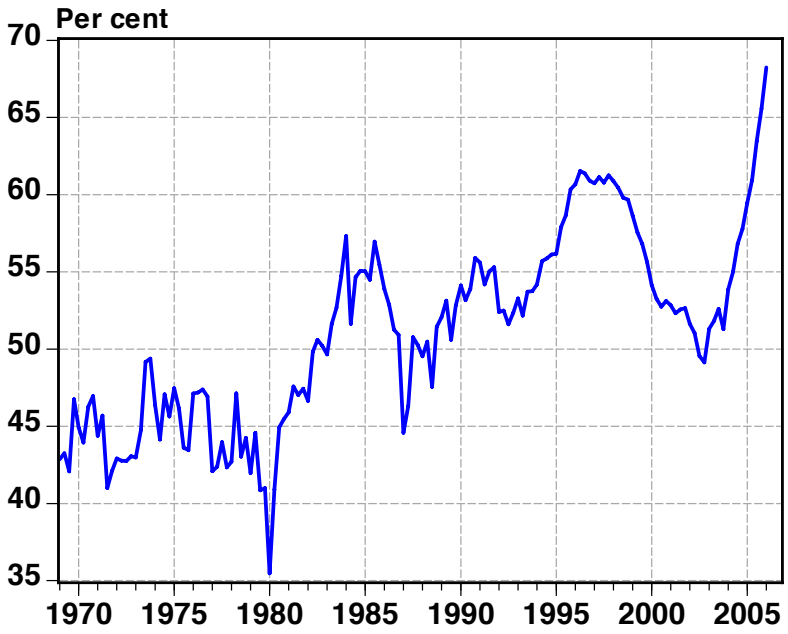
It will be noticed that the household debt ratio fluctuated around a broadly horizontal trend during the 1970s. It should be kept in mind that credit ceilings were in force from the late 1960s to 1972, moderating the rate of growth in bank credit extension. Credit growth picked up strongly from 1972 as the ceilings were lifted, but at the same time nominal disposable income rose vigorously on account of a rising gold price and accelerating inflation. (Inflation reached double-digit levels from 1974, and only returned to a single-digit level in the early 1990s.) Accordingly, the increase in the household debt ratio was fairly moderate. From 1976 to 1980 credit ceilings were again imposed, curtailing the rate of growth in bank credit extension. When they were finally abolished in September 1980, credit-hungry consumers streamed to the banks to take up credit which had previously not been available. Another gold boom, rising levels of employment and income, low interest rates and financial liberalization blunted sensitivity to borrowers' creditworthiness and fuelled strong increases in household debt in the early 1980s.

Following the rapid increase in the household debt ratio up to the mid-1980s, a sharp tightening of monetary policy and deterioration of economic prospects dampened households' appetite for debt. The prime overdraft rate, which serves as a benchmark lending rate, was raised very rapidly in 1984 to a level of 25 per cent per annum. In addition, financial sanctions were imposed on South Africa, damaging economic prospects and confidence. In this process the debt ratio declined significantly.

In the late 1980s the upward trend in the debt ratio was resumed as banks developed innovative financial products such as flexible mortgages. In addition, the repeal in the late 1980s and early 1990s of discriminatory legislation opened up the opportunity for black South Africans to acquire businesses and real-estate in previously forbidden areas, and to make use of the banking system - including its credit facilities - on a greater scale than before.

Figure 1

Ratio of household debt to disposable income



Source: Research Department, South African Reserve Bank.

The upward trend in the debt ratio continued until 1996, leveling off as a tight monetary policy was maintained. However, following the Asian crisis of 1998 interest rates were raised quite rapidly to new record levels, with the prime overdraft rate rising as high as 25,5 per cent per annum. This suppressed expenditure, dampened real-estate activity and prices, caused construction activity to slow, and stopped households' use of credit in its tracks. Despite a considerable reduction in interest rates from 1999 to 2001, households remained hesitant to increase their borrowing.

A comparatively moderate tightening of interest rates in 2002 also contributed to subdued growth in household debt. The debt ratio only started rising again by 2003, as interest rates were lowered. Rising house prices reinforced the demand for and supply of mortgage finance, while the ready availability of such finance, alongside strong consumer confidence, contributed to rising house prices. Robust final consumption expenditure simultaneously raised the demand for other types of finance. The increases in the household debt ratio has been sustained from 2003 to the present day, with successive new record highs being reached.

Modelling key relationships

This section endeavours to illustrate the usefulness of the household debt data in the context of a simple empirical model. An attempt is made to estimate how sensitive insolvencies are

to changes in interest rates, and to establish the time horizon over which this response is observed. Similarly, an attempt is made to estimate how sensitive household debt is to interest rates. The modeling is kept simple and straightforward, and instead of dealing with long-term equilibria it rather focuses on behaviour within a business cycle time horizon.

The number of *insolvencies* of individuals and partnerships in South Africa is small relative to the population - generally only a few hundred per quarter, in a country with a total population which currently exceeds 47 million. Insolvency is not a popular outcome from the point of view of creditors. With insolvency, creditors typically collect a fairly small amount relative to the debtor's outstanding debt, and thereafter can no longer claim any further amounts from the insolvent debtor. By contrast, less dramatic court orders, such as judgements for debt, leave creditors in a position where they retain the option to claim payment from the debtor's future income.

Nevertheless, insolvency is usually a demonstration of severe financial distress and a worthwhile economic indicator to watch closely. High interest rates may be expected to lead to more insolvencies through at least two channels: Firstly, through the cost-of-debt channel, where those agents who are heavily indebted find that the cost of servicing that debt escalates as interest rates rise, reducing their cash flow and ability to service that debt to the point where some are declared insolvent. This is aggravated through the second channel: Where the demand for products is interest-rate sensitive, higher interest rates reduce sales and thereby also the cash flow of the producers, pushing some of them closer to insolvency.

In determining how strongly the number of insolvencies responds to changes in interest rates, both nominal and real interest rates were employed. Various lag structures were also investigated, since it takes some time for changes in interest rates to work through to household finances, and further time for the legal process to run its course in instances of insolvency.

It was found that the level of nominal interest rates, as proxied by the prime overdraft rate, is statistically more successful in explaining insolvencies than real interest rates. This can probably be viewed as confirmation of the importance of cash flow - influenced by the level of nominal interest rates - in shaping the financial health of households. Had South Africa experienced very high or hyperinflation, it is of course quite possible that the finding regarding real interest rates being less relevant would have had to be revisited. In finding an appropriate lag structure, an Almon lag using a second-degree polynomial with endpoint restrictions was found to be reasonably successful. The chosen function is as follows:

		t−value
$INSPM_t$ =	–11,37	(–7,18)
	+0,10516 $PRIME_{t-3}$	
	+0,18694 $PRIME_{t-4}$	
	+0,24536 $PRIME_{t-5}$	
	+0,28041 $PRIME_{t-6}$	
	+0,29210 $PRIME_{t-7}$	
	+0,28041 $PRIME_{t-8}$	
	+0,24536 $PRIME_{t-9}$	
	+0,18694 $PRIME_{t-10}$	
	+0,10516 $PRIME_{t-11}$	
Sum of lags	1,92784	(19,28)

Where INSPM = Quarterly number of insolvencies per million of the population

PRIME = Prime overdraft rate of the banks, per cent per annum

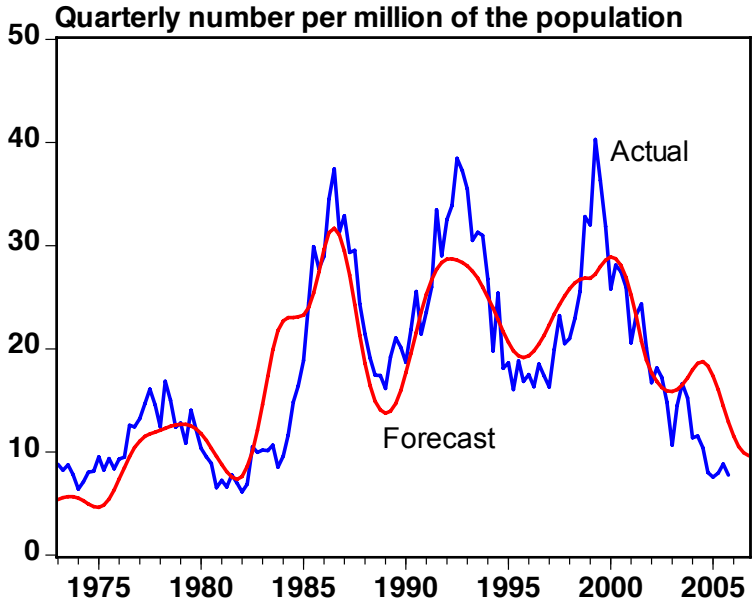
Method: Ordinary least squares.

Sample (adjusted) 1972Q4 to 2005Q4; 133 observations

R-squared	0,739559
Adjusted R-squared	0,737571
S.E. of regression	4,570724
Durbin-Watson stat	0,376694
Dependent variable: Mean	18,21610
Standard deviation	8,922350
F-statistic	371,9937

Figure 2

Insolvencies



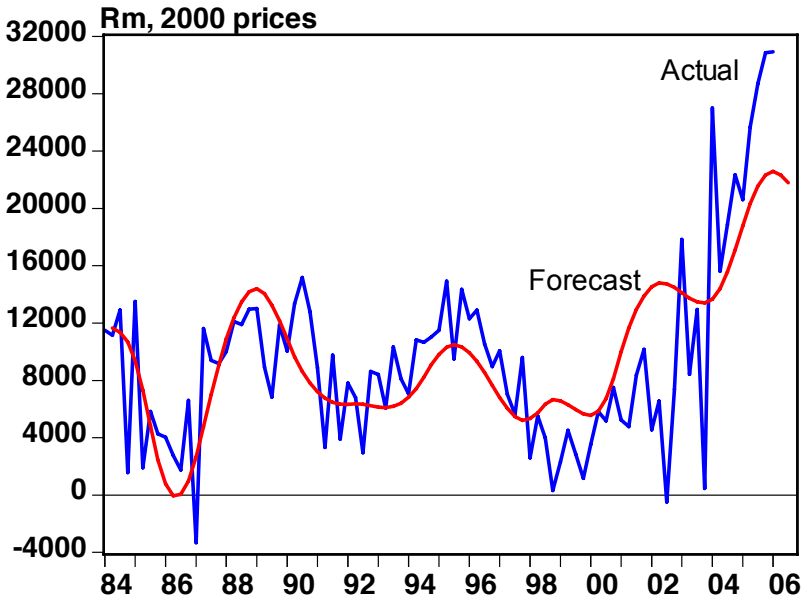
Source: Research Department, South African Reserve Bank.

As sustained increase by one percentage point in the prime overdraft rate is therefore calculated to give rise to an increase of 10,5 per cent in the number of insolvencies after 11 quarters, evaluated at the mean level of insolvencies over the sample period. The elasticity of insolvencies with respect to interest rates is 1,6, evaluated at the sample mean levels of the relevant variables.

Similarly, the modelling of *household debt* was investigated. In view of the rising trend in the level of nominal household debt and the associated statistical problems which could be expected, the quarterly changes in the real value of household debt was used as dependent variable. This was modelled as a function of nominal interest rates and of house price inflation - the latter because more than half of household credit consists of mortgage finance, with rising house prices making it more attractive to incur debt in order to acquire a house. Again, Almon lags were employed using second-degree polynomials with endpoint restrictions.

Figure 3

Changes in household debt



Source: Research Department, South African Reserve Bank.

The chosen function is as follows:

		t−value
$DRDEBT_t$ =	26644	(6,93)
	–64,682 $PRIME_{t-1}$	
	–114,990 $PRIME_{t-2}$	
	–150,924 $PRIME_{t-3}$	
	–172,485 $PRIME_{t-4}$	
	–179,672 $PRIME_{t-5}$	
	–172,485 $PRIME_{t-6}$	
	–150,924 $PRIME_{t-7}$	
	–114,990 $PRIME_{t-8}$	
	–64,682 $PRIME_{t-9}$	
Sum of lags	118,583	(–6,03)
	+17,17 $INFHOUSE_{t-1}$	
	+30,52 $INFHOUSE_{t-2}$	
	+40,06 $INFHOUSE_{t-3}$	
	+45,78 $INFHOUSE_{t-4}$	
	+47,69 $INFHOUSE_{t-5}$	
	+45,78 $INFHOUSE_{t-6}$	
	+40,06 $INFHOUSE_{t-7}$	
	+30,52 $INFHOUSE_{t-8}$	
	+17,17 $INFHOUSE_{t-9}$	
Sum of lags	+314,75	(4,20)

Where DRDEBT = Change in real household debt at constant 2000 prices, using CPI as deflator

PRIME = Prime overdraft rate of the banks

INFHOUSE = Inflation over four quarters in house prices, per cent, based on data obtained from Absa bank

Method: Ordinary least squares. Sample (adjusted) 1984Q2 to 2006Q1

R-squared	0,502664
Adjusted R-squared	0,490962
S.E. of regression	4783,034
Durbin-Watson stat	1,396989
Dependent variable: Mean	9500,167
Standard deviation	6703,914
F-statistic	42,95534

The period of bank credit ceilings (up to 1980) and initial catch-up growth in credit extension thereafter was excluded from the estimation. As with insolvencies, the long lag of more than two years before changes in the explanatory variables fully work through to changes in household debt is striking, although not unexpected.

Conclusion

South Africa's data on household debt is estimated using creditor information. Compilation is complicated by a number of factors, such as securitisation. Nevertheless, the aggregate level of household indebtedness is measured in a responsible and comprehensive way. Some refinements can nevertheless be contemplated and several qualifications need to be kept in mind when interpreting the level of aggregate household debt.

The paper illustrates the usefulness of the debt data in the context of a small econometric model. The relationships described in this paper can be expanded to include more variables, and to pay the necessary attention to long-term equilibria.

More ambitiously, household debt is but one part of the household balance sheet. Recently, comprehensive timeseries data on the household balance sheet were constructed by Aron, Muellbauer and Prinsloo (2006), making it possible to more adequately reflect wealth effects, and also to develop integrated models of the stocks and flows related to the household sector.

Since the distribution of household debt across the household sector is important in fathoming the degree of robustness or fragility of the household sector's finances, further work in this area may be contemplated. In this connection, the national register of credit agreements envisaged in Section 69 of the National Credit Act is likely to be an invaluable source of information.

Appendix

Data sources for the calculation of household debt

Type of instrument	Sources and notes
Mortgage advances	
Banks' regular mortgage advances	Banks' monthly balance sheets
Other mortgage advances	Data on securitisation obtained from banks, the Bond Exchange and non-bank financial institutions; data on regular mortgage advances obtained from non-bank financial institutions.
Other advances	
Bank's regular instalment sale and leasing finance	Banks' monthly balance sheets
Other instalment sale and leasing finance	Data on securitisation obtained from banks, the Bond Exchange and non-bank financial institutions; data obtained from vehicle finance companies; data obtained from Statistics South Africa and extrapolated using sales data and industry sources.
Banks: Overdrafts	Banks' monthly balance sheets
Banks: Credit card advances	Banks' monthly balance sheets
Banks: General advances	Banks' monthly balance sheets
Non-bank microlending	Data from National Credit Regulator/ Micro-Finance Regulatory Council
Other financial sector advances	Data from insurers and pension funds
Non-financial sector advances	Data obtained from Statistics South Africa and extrapolated using sales data and industry and other sources.

Note: Household debt includes debt of unincorporated businesses.

Source: Research Department, South African Reserve Bank.

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The distribution and dispersion of debt burden ratios among households in Poland and its implications for financial stability

Sławomir Zajączkowski[1] and Dawid Żochowski[2]

1. Introduction

Recent acceleration of credit growth in Poland has raised the question whether the loan growth rate in Poland was excessive or not. The main source of growth in the lending of banks in Poland are loans to households. Most of recent international surveys of this phenomenon conclude with excluding Poland from the group of countries with excessive credit growth (Boissay, Calvo-Gonzalez and Koźluk, 2005; Kiss, Nagy and Vonnak, 2006). However, the results on most of these surveys are based on the analysis of the growth of total credit. In this context, it is worth comparing the situation in Poland to that of some other EU countries. During periods of rapid growth in lending in Portugal, Ireland and Greece, the loan-to-GDP ratio doubled in around eight years.[3] This had no adverse effects such as any significant macroeconomic imbalance or a sizeable increase in inflation. In order for the loan-to-GDP ratio in Poland to double within eight years (i.e. from 26.5% in December 2005 to 53% in December 2013), the overall loan portfolio would have to grow by 16.8% each year in nominal terms (assuming GDP growth in line with the projection – at 4.5%, and inflation in line with the MPC target – at 2.5%). In 2005, the overall loan amount grew by 13.1%. Although this growth rate is higher than the average lending growth in 2003-2005 (7.7%), it remains lower than the growth dynamics observed in the aforementioned countries. Assessment of the impact of such lending growth rate on financial system stability depends on both macroeconomic and institutional conditions in which the growth takes place and distribution of the debt among different income groups of households.

2. Debt burden on the aggregate level

The analysis of aggregate data yields a very optimistic picture of household loan burden (see Figure 1). Currently, total household debt does not exceed 2.5 times monthly gross disposable income of households. However, existing data indicate that this debt is very concentrated - only an estimated 30% of households have debts currently[4], while only 3% of households have housing loans outstanding. The share of housing loans in the overall loans to households' portfolio in June 2006 came to 40.6%.

Due to the improvement of the sentiment of households and banks, loans grew more rapidly than household disposable income. As a result, the household loan burden increased; its growth rate rose in the second half of 2005. In spite of this, the burden ratio remains low

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3 In those countries, the rapid growth in loans was also, to some degree, linked to financial market deregulation (Brzoza-Brzezina, 2005).

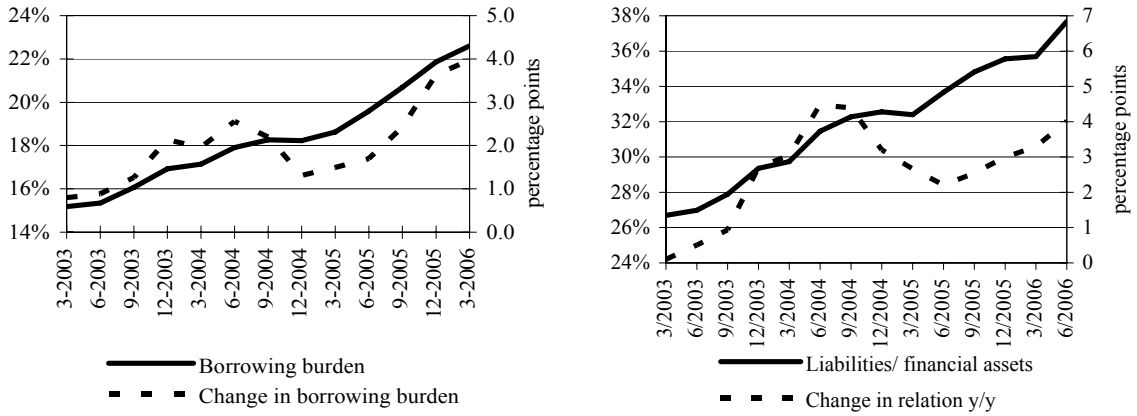
4 Debt includes liabilities to banks and other entities.

compared to other EU countries, which is the result of the relatively low level of indebtedness in Poland.

Whilst coming to such conclusion, differences in the circumstances in which the lending growth took place in the economies under review should be borne in mind. Institutional conditions underlying the growth in lending have an impact on the emergence of additional sources of risk or on risk reduction. In Portugal, Ireland, and Greece, high growth of lending took place in the circumstances of, among other things, progressive liberalization of services markets (Brzoza-Brzezina, 2005). Experience to date shows that a rapid increase in loans occurring simultaneously with financial market liberalization processes may constitute a significant factor in the emergence of financial crises. It results from the fact that financial institutions over new financial products whose risk structure has not been fully diagnosed. Deregulation processes in Poland, however, were completed several years ago, thus they do not constitute a risk factor. On the other hand, additional risk sources may be indicated. They result inter alia from shorter than in EU15 countries period of experience in operating on credit market. So it means that a risk arises of some households making excessively optimistic assessment of their loan repayment capacity, which may lead to immoderate growth in demand for loans.

Figure 1

Borrowing burden in household sector



Note: Borrowing burden ratio (left panel) = loans to households (residents)/annual gross disposable income.

Source: GUS, NBP.

On the basis of the presented comparative analysis of loan growth rate in Poland a conclusion may be drawn that the observed lending growth rate does not pose an imminent threat to banking system stability. Nevertheless, this process needs to be closely monitored.

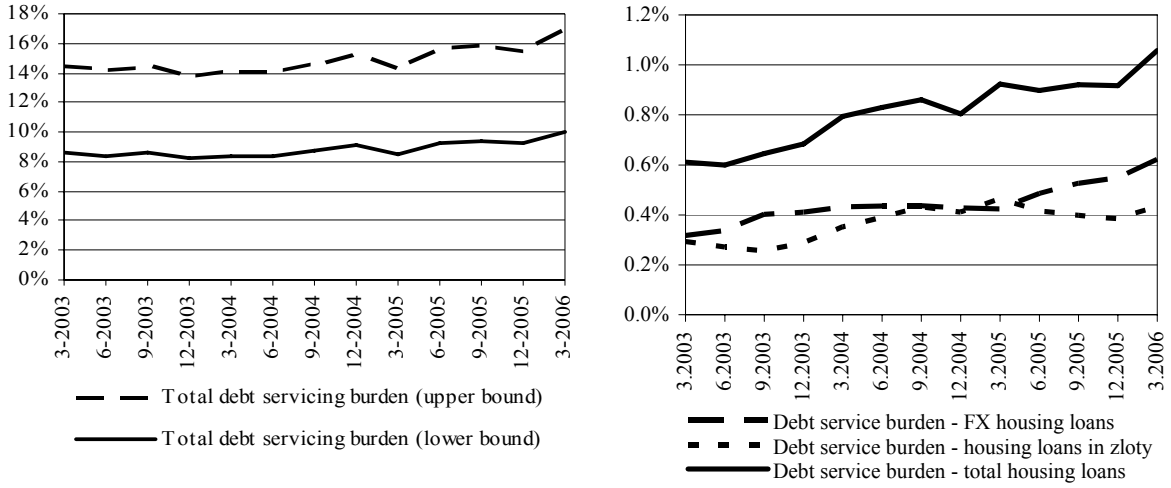
The relatively rapid growth of housing loans was not accompanied by significant changes in debt service ratios. In 2005, the overall housing loan service burden grew by only 0.13 percentage points (i.e. 14%) to 0.92%. The zloty housing loan service burden decreased, so the upward movement in the ratio was the result of the relatively rapid rise in the foreign currency housing loan service burden, which went up by 0.12 percentage points, i.e. 27.9%, to 0.55%.

The levels of household debt service burden and interest burden ratios in Poland are low compared to the euro area, which may suggest a relatively large reserve in the households'

ability to repay their liabilities. It should be remembered, though, that those ratios have been calculated for aggregate data and include all households, and not only those that have bank debts. In view of the low utilization of bank loans[5], the actual loan service burden of borrower households is higher. The difference between the burden calculated based on aggregate data and individual data may be considerable. For example, the household mortgage debt service ratios in the euro area estimated by the ECB using macroeconomic data (national accounts data including all households) are equal to only one quarter of the ratios yielded by microeconomic data (European Community Household Panel data) (Monthly Bulletin, 2005). Due to the fact that around 20% of euro area households have contracted mortgage loans, while in Poland the proportion is much lower, it should be expected that the difference between burden measures calculated in those manners will be even larger here. In the next section we present a preliminary analysis of household liability servicing burden using individual data.

Figure 2

Overall debt service burden (left panel) and housing loan service burden (right panel) in the household sector



Note: The debt service burden is the ratio of total principal and interest instalments paid by households to disposable income. Due to lack of data on maturity of consumer loans, the average maturity of one year (upper limit) or two years (lower limit) has been assumed.

Source: NBP calculations.

Currently, the household debt service burden may increase significantly, since at the beginning, housing loans were extended to households with higher average incomes. With time, lending maturities were extended and other loan terms and conditions were eased. Currently, it is possible that loans are granted to households that have smaller safety income buffers against a rise in loan interest rates or a depreciation of the zloty against the euro and the Swiss franc.

[5] According to a survey by Pracownia Badań Społecznych (PBS), a market research company, around 10% of households had bank debts in 2004: 3% of respondents reported mortgage loan outstandings and 7% _ consumer loans (Raport z badania , 2005).

3. Debt burden analysis on the micro level

3.1 Methodology of households budget surveys

The household budgets survey conducted yearly by the Central Statistical Office (Główny Urząd Statysyczny - GUS) mainly focuses on household income and expenditure. The results of the survey are based on a questionnaire filled in by household members participating in the survey.

Household income and expenditure grouping is made in accordance with the system of national accounts. One of expenditure groups that has been surveyed is expenditure relative to loan repayment embracing the repayment of both interest and principal. GUS conducts household budget survey using the total monthly rotation method which means that every month a different household group participates in the survey. Households to be surveyed are selected according to a two-stage stratification method of drawing a sample. The strata reflect territorial division of the country into *voivodships* and, within the *voivodships*, the division according to the size of the place of residence.

In the first stage of drawing the sample, area survey points (asp) are selected which embrace statistical regions according to the recent Census of Population and Households (regions with too few housing units are combined with neighboring regions). The asp selected in this way (first stage sampling frame) are stratified according to *voivodships* and strata are then identified in each *voivodship* according to the size of the place of residence. Next, a number of asp is drawn in each strata separately to obtain the number of asp derived from one stratum proportional to the number of housing units therein. As a result, the probability of selecting any of the housing units is approximately the same.

In the second drawing stage housing units are drawn separately for each asp drawn in the first stage drawing and the sequential method is used. In the housing units selected in this way all households occupying the unit are surveyed (two or more households may occupy the same housing unit if they do not combine their income and have separate budgets).

If a household has not responded to the survey, a different household is selected in its place from the reserve list drawn earlier.

A factor negatively influencing the quality of household budget survey results is the high percentage of households that have been drawn for the survey but have not responded to it. This percentage shows a rising trend. In 1997, it stood at 34.3% (Metodyka , 1999), in 2000, it rose to 49.2% (Budżety , 2001), and in 2004 - to 53.9%. A particularly high rate of refusals is observed in pensioners' households and households of working people. As the distribution of households that do not participate in the survey may be different to that of households replacing them a weight is determined for each household and is used to calculate average values of income, revenue, expenditure and other features of households. Since 2004, the weights are determined on the basis of the relationship between the structure of households according to the number of persons and place of residence pursuant to the recent Census of Population and Households (Budżety , 2004)[6].

When calculating the average income, expenses and other parameters, households weights are accounted for which they take into consideration the incomplete representativeness of the sample. Owing to the above the values of distribution parameters estimated according to statistical methods are more closely related to the real parameters.

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[6] Until 2003, weights were calculated on the basis of the number of persons and socioeconomic group of households derived from so called initial interview conducted with each of the selected households prior to commencing the expenditure survey.

The survey method is described in detail in a GUS publication (Metodyka , 1999) including minor changes related to the way of determining weights, identifying strata and period for which samples are drawn. The same methodology has been used until now.

3.2 Methodology of estimating debt burden indicators on the basis of household budget survey data

For the purpose of the analysis of the distribution of household debt service burden, two ratios have been defined: the debt service ratio and the bank loan service ratio. The debt service ratio is the proportion of payments arising from all four debt servicing categories in total household available income. On the other hand, the bank loan service ratio is defined as the proportion of payments arising from building society loans and other bank loans in total household available income. The ratios were only calculated for those households that indicated a non-zero amount related to debt payments in any category during a given month (each household reported its expenditure for one month of the year when the survey was conducted). The subsample of households which inhabit flats or houses with mortgages have also been distinguished within the sample of households taken into account for calculation of the loan service ratio. For this subgroup, the dispersion and distribution of the loan service ratio have been calculated separately, which should provide some data on the mortgage burden on households.[7]

Weights correcting the incomplete representativeness of the sample that are described in the previous chapter have been used for the calculation of average values and order statistics. For example, a corresponding formula to calculate the average loan service ratio is as follows:

$$DBR_i(SE,Y) = \frac{\sum_{i=1}^{N} SE(i)\frac{w(i)}{Y(i)}}{\sum_{i=1}^{N} w(i)},$$

where:

DBR - average loan servicing burden of households

N - number of households

w(*i*) - weight of *i*-th household, correcting the incomplete representativeness of the sample

SE(*i*) - expenses of *i*-th household on debt service in the survey period

Y(*k*) - diposable income if *i*-th household in the survey period

Average values and order statistics have been determined in a similar way for the bank loan service burden ratio, defined as the relation of household expenses on bank loan repayment to disposable income of households in the survey period.

An analysis was also made of the distribution of values of the above mentioned ratios broken by households' affluence level measured by the level of income equivalent for one household member according to OECD equivalence scale - i.e. the first adult household member is assigned a value of 1, each additional person aged 14 years and more is assigned 0.7 and the value of 0.5 is assigned to each child below the age of 14 years. To assess the

[7] The manner in which this household subgroup has been distinguished does not guarantee that the loan burden is the result of a mortgage loan only, since the household may be repaying e.g. a consumer loan that is not secured by mortgage at the same time. From the point of view of banking sector stability, however, it is important to determine the actual household burden and not only the burden arising from the repayment of mortgage loans.

dispersion of the above mentioned ratios median values of debt burden ratios were analyzed in quartile groups identified on the basis of the size of equivalent income per household member.

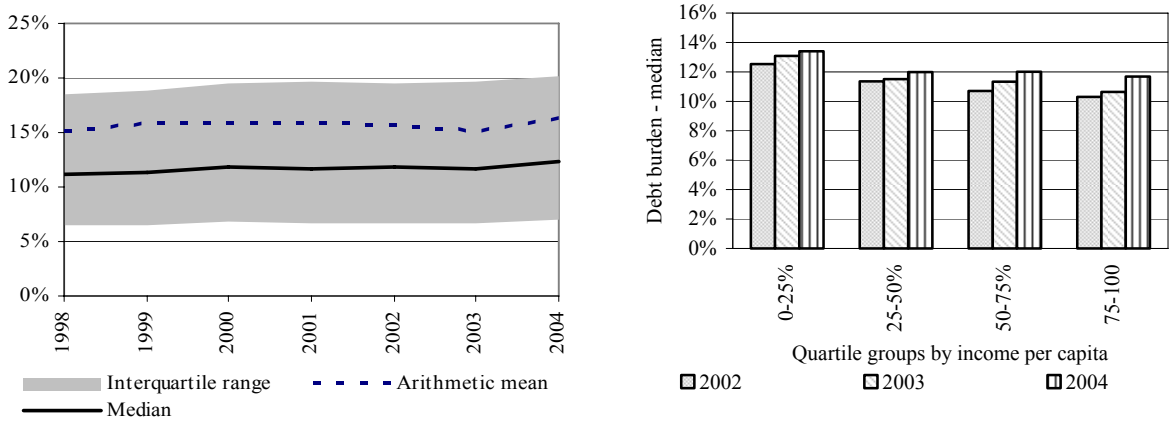
3.3 Distribution and dispersion of debt service burden

The debt and debt service burden ratios calculated using aggregate data for the entire household sector do not yield the complete picture of the risk to financial system stability. Data concerning the burden of households in individual income brackets are also important, since a greater burden on those household groups whose financial condition is less favourable may translate to a higher probability of default if lending rates rise or the zloty depreciates.

Results of GUS yearly surveys entitled "Household Budget Surveys" (pol. Budżety gospodarstw domowych) give some insight into debt burden distribution. Apart from a significant amount of data on consumption expenditure, households participating in the survey also declare the amounts of debt servicing payments, broken down into four categories: building society loans, other bank loans, loans from other financial institutions, and loans from private persons. Survey data indicate that the proportion of households that indicated any debt servicing costs during the survey month amounted to 30.4% in 2004 and was by one percentage point lower than in 1998. On the other hand, the proportion of households indicating bank loan payments increased (from 18.8% in 1998 to 22.1% in 2004) during this period.

Figure 3

Household debt service burden - dispersion (left panel)[1] and distribution in terms of equivalent income per person (right panel)



[1] Of available income.

Source: NBP calculations based on GUS data.

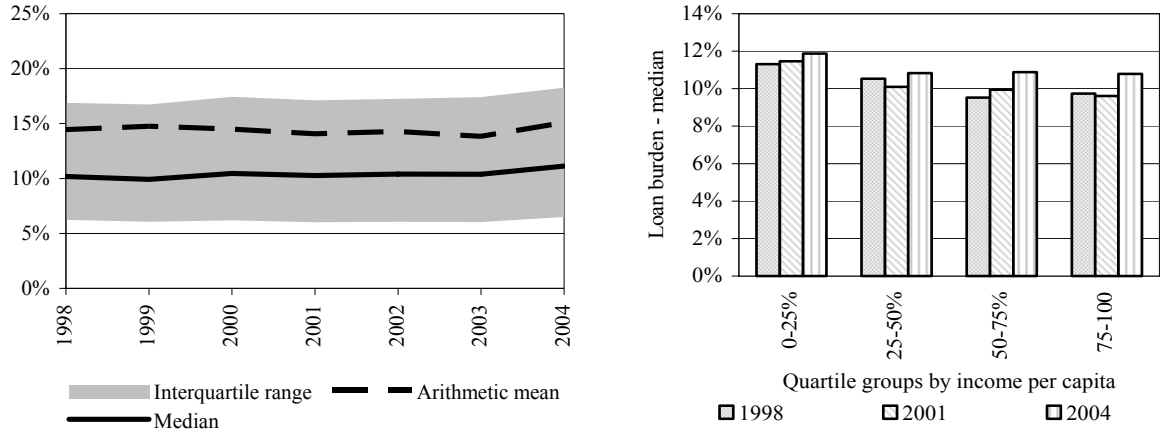
The analysis of debt service burden ratio dispersion shows that a higher number of households exhibited relatively high debt service burden ratios. This is evidenced by the fact that the mean exceeds the median, which represents the typical burden ratio level (see Figure 3, left panel). During the seven-year period covered by the survey, household debt burden did not increase considerably - the mean and the median rose by just one percentage point. The absence of significant increases in the debt service burden ratio despite the rapidly rising household debt during the period under examination was the result of an improvement in the households' financial standing as well as a drop in interest rates, which reduced interest payments.

From the viewpoint of financial system stability, the distribution of debt service burden among households depending on per capita income is highly significant. Household budget surveys indicate that households in the lowest income bracket (the first quartile group in terms of equivalent income per household member according to the OECD equivalence scale) exhibit the highest debt service burden. The household burden ratio did not vary significantly among the remaining income groups in 2004 (see Figure 3, right panel).

The largest part of household debt payments is related to bank loans, therefore the loan service burden is only slightly lower than the debt service burden. The loan service burden ratio remained stable between 1998 and 2003, but grew in 2004 (see Figure 4, left panel). These changes may be explained by the higher rate of growth in loans to households in 2004, in comparison to the preceding years. It appears that in 2004, the impact of this factor prevailed other factors, which reduced the rate of growth of ratio in previous years, i.e. the decrease in interest rates and the increase in household income. Despite the fact that no 2005 data are available yet, it may be confidently expected that in 2005 the loan service burden increased, since the banks' lending accelerated during this period. It should, however, be taken into account that household debt grew largely due to housing loans. Since such loans are usually extended for longer periods and at lower interest rates than consumer loans, their impact on the increase in loan service burden is smaller than in the case of other loans (lower average principal instalments and average interest payments).

Figure 4

Household loan service burden - dispersion (left panel)[1] and distribution in terms of equivalent income per person (right panel)



[1] Of available income.

Source: NBP calculations based on GUS data.

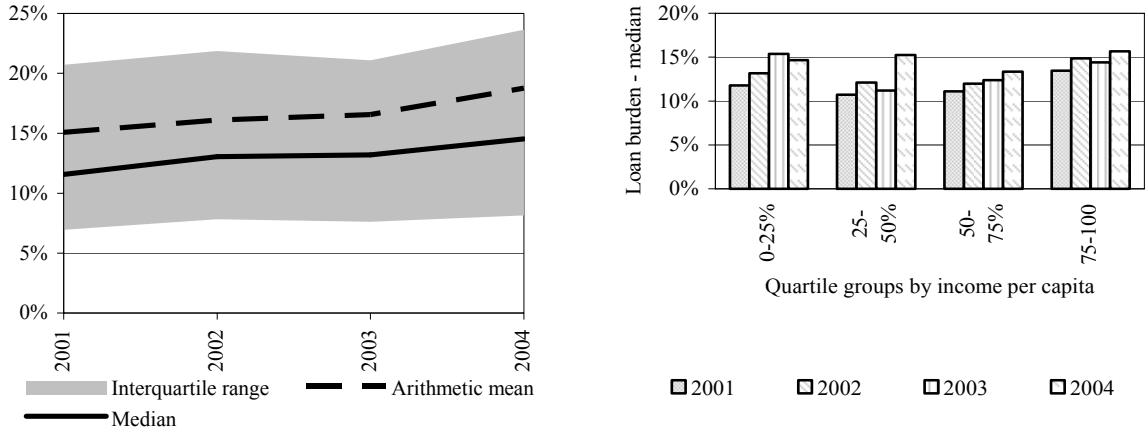
The distribution of the loan service burden as a proportion of household income is similar to that of the debt burden ratio (see Figure 4, right panel). Lowest-income households (in the first quartile group) exhibit the highest burden ratios, but differences compared to other income brackets are not very significant. There is also a weak trend towards an increase in the loan service burden in higher-income groups (third and fourth quartile groups). Higher loan service ratios for households in lower income brackets are typical of EU-15 countries. In Poland, a significant increase in burden may be particularly important for financial system stability, since potential defaults on credit liabilities may occur for lower burden ratios due to the fact that the proportion of basic living costs in total consumption expenditure is higher for Polish households than for EU-15 ones. According to the latest Eurostat data from household

budget survey (Household Budget Survey, 1999) the proportion of basic living costs in total consumption expenditure for UE-15 MS totalled 44.7% while in Poland it stood at 55.9%[8].By basic living costs we mean expenditure on the basics of consumption goods and services, i.e. food and non-alcoholic beverages, useof- house related costs, water, electricity, gas, other furls and health (some of the expenditure of other expense groups, such as transport, personal hygiene or education are also of fixed character). In practice such expenses cannot be significantly reduces when a household's income falls. The average share of the above mentioned basic living costs in disposable income of the group of Polish households that are repaying bank loans amounted to 45.3% in 2004. If expenses on loan repayment, which is also of fixed character are added, the proportion of basic living costs in income increases to 60.1%.

The average proportion of basic living costs in the total consumption expenditure of Polish households, which is 11 percentage points higher than in the EU, results in a significantly lower than EU-15 safe-level threshold of debt burden on their household budgets related to loan debt service burden.

Figure 5

Household loan service burden for households living in flats or houses with mortgages - dispersion (left panel)[1] and distribution in terms of equivalent income per person (right panel)



[1] Of available income.

Source: NBP calculations based on GUS data.

The higher debt service ratio in the lowest quartile group in proportion to income per person in the household is particularly dangerous, especially as it is accompanied by a very high proportion of basic living costs to the disposable income. In the first quartile group this proportion is 69.6%, and when fixed expenditure on loan servicing is added it totals 88.9% (see Figure 6). A fall in income by more than 11.1% will therefore lead to the fact that the households' income will not be sufficient to cover the most basic fixed consumption expenditure or repay bank loans. Therefore, households from the lowest quartile group have a very low level of "safety income buffer" (also called "margin"), i.e. the percentage of

[8] According to data from 2004, in Poland the proportion went down only slightly (to 55.7%) despite a significant GDP growth per capita.

disposable income that is left after deducting of debt payments and basic living costs. Owing to the low value, the buffer may easily be disturbed if unfavourable developments in the external environment arise, e.g. a fall in household's income resulting from the rise in unemployment or an in crease in debt service burden resulting from interest rate growth and/or zloty depreciation which affects loans denominated in foreign currencies.

For households inhabiting flats or houses with mortgages, the loan burden ratio has grown more rapidly. The Central Statistical Office survey only makes it possible to examine this household subsample separately from 2001 onwards. Despite the fact that the analysis covered a shorter period, the household loan burden in this subsample has risen significantly – the mean ratio has increased by 3.7 percentage points, and the median has grown by 3 percentage points. Mean and median increases were chiefly the result of the rising number of households with relatively higher burden ratios, which is evidenced by an increase in the upper quartile by 2.9 percentage points and the widening of the interquartile range.

The distribution of loan service burden as a proportion of household income in this subsample is more dispersed than for debt and loan burden ratios both over time[9] and between quartiles. The loan service burden for households that are repaying housing loans has increased significantly in all income quartile groups, but between 2001 and 2004 this ratio grew the most in the first two quartile groups. This appears to be a sign that the banking sector has matured and has extended services to new customer segments. Initially, housing loans were extended primarily to households with higher average incomes. As interest rates decreased and the banks' lending policies were eased, mainly as a result of extended loan terms and a reduction in loan margins, loans have also become available to households with lower average incomes. Therefore further movements of the loan burden ratio for quartile groups with lower income per capita should be observed, especially that the easing of credit standards as well as loan terms and conditions in the housing loan segment was primarily caused by increased competition among banks (Senior Loan Officer Opinion Survey, 2006).

The loan service ratio for households inhabiting flats or houses with mortgages may be compared to the mortgage debt servicing-to-income ratio calculated by the ECB on the basis of the European Community Household Panel survey conducted in EU-15 countries (Monthly Bulletin, 2005). For EU-15 countries, where the median for the years 1996-2001 was around 20%, this ratio is higher than in Poland where the median grew from 11.6% in 2001 to 14.5% in 2004[10], despite the fact that the ratio calculated by the ECB only takes into account the burden arising from housing loan repayments. Therefore, compared to EU-15 countries, the potential exists in Poland for the further growth of housing loan burden. In Poland as in EU-15 countries (Monthly Bulletin, 2005), the distribution of the mortgage debt servicing ratio among individual income groups indicates that in lower income brackets, the housing loan servicing burden is higher than the average.

As we mentioned before, the proportion of fixed consumption expenditure in Polish household budgets is higher than in more affluent EU-15 countries. This proportion is particularly high among poorest households (the first quartile group in terms of income per household member). Therefore it seems, that in Poland the level of housing loan burden that is safe for banks is lower than in other EU-15 countries, particularly with regard to households with lower average incomes.

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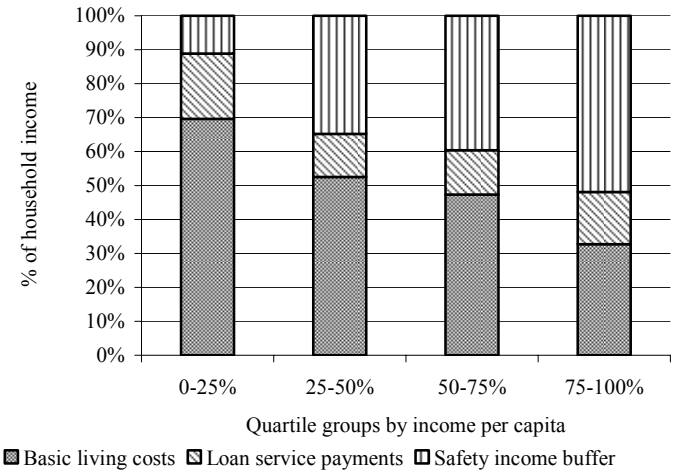
[9] The higher variance is partly attributable to smaller subsample size.

[10] The service ratios for Poland is estimated on the basis of available income, which is about 4% higher than disposable income used in EU statistics. Because of that the difference between Polish and EU15 debt service ratios counted using the same methodology would be somewhat smaller, but only by about 0.5%, so this do not change our conclusions.

Figure 6

Safety income buffer for loan repayments among different income groups



Source: NBP calculations based on GUS data.

4. Current threats for financial system stability stemming from housing loan market developments

The levels of loan burden both on the aggregate and microeconomic level are lower in Poland than in EU-15 countries and we believe they are safe. It should be noted, however, that there are certain tendencies that in the near future may be a source of risk to the financial system stability. At present, the fastest growing debt service ratio is the housing loan service burden. In 2003, housing loans increased at an average annual rate of 42.3%, and 37.8% in 2004. In 2005 average annual rate was slightly lower and amounted to 27.0% but in 2006 the growth in housing loans accelerated to reach 43.9% at the end of May. The majority of new loans - 70%-90% - are loans denominated in foreign currencies, usually in Swiss francs. The share of loans denominated in foreign currencies in housing loan portfolio of households grew from 58.5% in December 2002 to 66.3%. In Poland housing loans are usually extended at a floating interest rate.[11]

Foreign exchange and interest rate risk resulting from exposures is transferred onto the households. It does not mean, however, that banks do not incur some risk - the risk is transferred onto the banking sector indirectly through the credit risk of the bank's clients. The zloty exchange rate movements, the fluctuations of the foreign and Polish interest rate may therefore significantly influence households' capacity to meet liabilities in due time. The scale of threats is shown in table 1 which presents by what percent the principal and interest instalment of a loan denominated in foreign currency will grow following the interest rate shock combined with exchange rate shock.[12]

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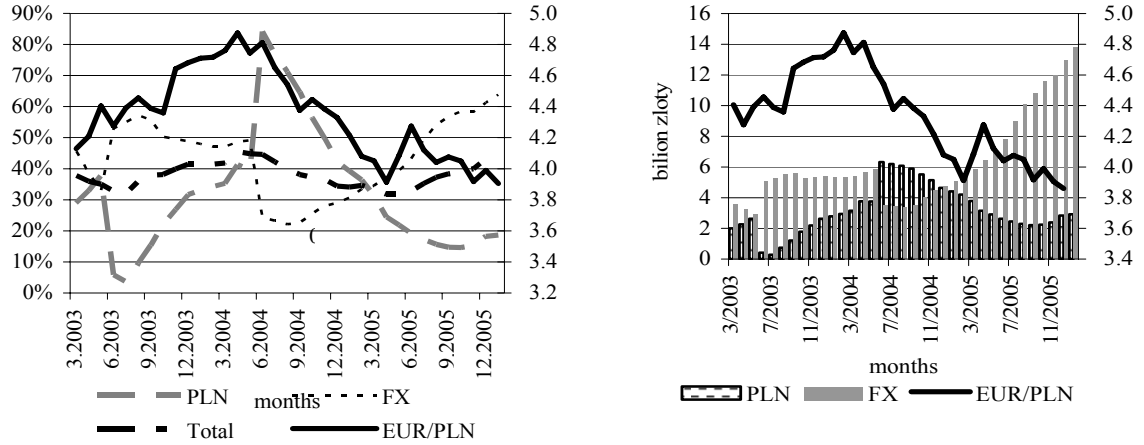
[11] Fixed interest rate is generally used for a short promotional period - up to two years from the date of loan contract.

[12] Depreciation scale may seem too big but there have been periods in Poland when the zloty depreciation was even bigger. For example, between April 2002 and April 2004 the zloty exchange rate vis-a-vis the euro increased by 34%.

Figure 7[1]

Growth in household zloty and foreign currency housing loans for households vs. FX rate - growth rate (left panel) and increase in PLN billion (right panel)



[1] Year on year growth.

Table 1

Simulation of the rise in principal and interest instalment of a loan following interest rate shock at different foreign exchange rate

+150 bp

Zloty depreciation	Time to maturity						Exchange rate (CHF/PLN)
	5	10	15	20	25	30	
0%	3,8%	7,3%	10,8%	14,1%	17,2%	20,2%	2,58
10%	12,2%	16,1%	19,8%	23,4%	26,8%	30,0%	2,84
20%	20,7%	24,9%	28,9%	32,7%	36,3%	39,8%	3,10
30%	29,2%	33,6%	37,9%	42,0%	45,9%	49,6%	3,35
34%	33,4%	38,0%	42,4%	46,7%	50,7%	54,5%	3,46

+200 bp

Zloty depreciation	Time to maturity						Exchange rate (CHF/PLN)
	5	10	15	20	25	30	
0%	5,0%	9,8%	14,5%	19,0%	23,3%	27,3%	2,58
10%	13,6%	18,8%	23,9%	28,7%	33,3%	37,7%	2,84
20%	22,2%	27,8%	33,2%	38,4%	43,4%	48,1%	3,10
30%	30,7%	36,7%	42,6%	48,1%	53,5%	58,5%	3,35
34%	35,0%	41,2%	47,2%	53,0%	58,5%	63,7%	3,46

Note: The rise by 150 percentage points has been assumed (upper panel) or by 200 percentage points (bottom panel) and equal principal and interest instalments

Source: Own calculations.

The developments in the housing loan market may therefore influence the stability of the financial system through a few mechanisms. First, accelerated credit growth may carry the risk of future deterioration in loan portfolio quality which will adversely affect banks' results. In the literature on the subject a few reasons for such a relationship are traditionally indicated (Clair, 1992): (1) a bank pursuing to enhance credit action may ease credit criteria and standards; (2) even if criteria remain unchanged, new clients have on the average a worse credit capacity as a result of entering new, more uncertain markets; (3) the bank may allocate insufficient resources to monitor loan repayment that would be adequate to the enhanced lending, which entails lowered loan quality; (4) if the bank's capital is depreciated significantly, shareholders pursuing revenue growth may be more willing to take higher risks as they have little to lose (moral hazard).

The results of the recent survey show that in fact, banks used to ease criteria and terms and conditions of loan extension even in periods of increased demand (Senior Loan Officer Opinion Survey, 2006).

In addition to the traditional threats to the stability connected with a faster credit growth there are other, Poland-specific threats at the moment. The simulation of the rise in principal and interest instalment presented above shows that interest rate risk for long maturities is of vital importance and combined with foreign exchange risk leads to the fact that housing loan instalments may increase significantly in a relatively short time.

In Poland the fact that banks have been extending housing loans for a relatively short time also seems important. We believe that despite the import of know-how the absence of knowledge about this product, in particular its life cycle in Poland, may have a considerable importance for banks when evaluating the risk of this product.

The property prices that have been increasing fast in big towns of Poland recently should make us aware of the possible speculation bubble. The risk may be imminent as Poland does not have good data bases which would enable to monitor the evolution of property prices.

None of the above mentioned risks is important enough to pose a threat to the financial system stability in the near future (Financial Stability Report, 2005) and the fast growth in housing loans results, to a large extent, from the improvement in households' situation (Senior Loan Officer Opinion Survey, 2006) and a better access to loans in Poland (Pruski and Żochowski, 2006). Nevertheless, we believe that the debt service ratio level, at which one of the risks may prove crucial for the financial system stability, is lower than in EU-15 as the proportion of fixed expenditure in the budgets of Polish households is higher. The safety income buffer where the debt may freely rise as a result of different shocks without a risk to stopping debt repayment is therefore lower in UE -15 countries. With a higher proportion of loans denominated in foreign currencies extended at floating interest rates and with larger movements of the exchange rate, it means that the risk to the financial stability system may be more important than in EU-15 countries despite a definitely smaller volume of housing loans in relation to GDP in Poland. It is also important because in recent years housing loan-repayment burden has been growing fastest in the first two equivalent income per capita household groups.

To avoid the possibly negative implications of foreign exchange risk exposure of mortgage loans of lower-average-income households, in March 2006, the Commission for Banking Supervision (CBS) adopted Recommendation S concerning good practice with regard to mortgage-secured credit exposures and obligated banks to comply with the recommendation beginning 1 July 2006. One of CBS recommendations is that banks, when granting loans denominated in foreign currencies, should analyse the client's credit worthiness making an assumption that the interest rate for a loan denominated in foreign currencies is equal to at

least the interest rate for a loan denominated in zloty and the principal of the loan is bigger by 20%. This is in fact a security measure for a depreciation of the zloty by 20% and a rise in interest rate of Swiss francs by 250 percentage points.[13] The bottom panel of table 1 shows by how much the credit worthiness of a household should be higher to enable it to draw a loan denominated in foreign currencies in the same amount as a zloty loan. Recommendation S will most certainly limit access to loans for lower-income households. In the future, the housing loan repayment burden in lower-income quartile groups should not grow so fast, which will reduce the risk to the financial system stability.

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[13] This is approximately the difference in interest on zloty and Swiss franc loan.

Risks to Romanian financial stability stemming from the household sector[1]

Florian Neagu[2] and Angela Mărgărit[3]

1. Economic behavior of households and consequences for financial stability

1.1 Household consumption and savings

Usually, households' consumption represents the most important component of aggregate demand. Understanding households' consumption behaviour, especially in response to exogenous shocks, is an important source of information in assessing short term volatilities, long term economic trends and also the patterns of external trade as reflected by the balance of payments.

From a financial stability point of view, observed changes in the dynamics of and the breakdown of households' consumption into sub-groups are of key importance in considering their impact on households' indebtedness.

Looking at Table 1.1, the ratio of households' consumption to GDP (average propensity to consume) has been a steadily growing after its 2002 low (when the growth of final consumption was smaller then that of previous year and the contribution of net export to GDP was positive).

Table 1.1

Dynamics of households' propensity to consume

	1998	1999	2000	2001	2002	2003	2004
Average propensity to consume	0,832	0,830	0,789	0,785	0,772	0,779	0,794
Marginal propensity to consume	–	0,828	0,702	0,776	0,726	0,808	0,853

Source: National Institute of Statistics and own estimations.

The contribution of consumption to GDP might grow in the future due to: (i) the downward trend of interest rates, (ii) the expectations of budget deficit restrictions for the coming years, and (iii) the appreciation path of domestic currency. The likelihood of this scenario is sustained by the more recent trends (since 2003) of the marginal propensity to consume compared to the average propensity to consume (Table 1.1).

[1] The opinions expressed in this paper are those of the authors and do not necessarily represent the views of the National Bank of Romania, nor do they commit the Bank in any way.

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Table 1.2

Average monthly gross salary at the end of 2004, EUR

EU-10 Countries	EU-15 Countries
Slovakia - 462,8	Spain - 1641,14
Poland - 594,8	France - 2274,5 (in 2002)
Czech Republic - 652,08	Ireland - 2434,03
Hungary - 668,6	Germany - 2507

Source: IMF (SDSS), central banks websites and own estimations.

The assumption that households' consumption expenses will grow and even significantly, is further supported by the analysis of households' economic behaviour based on the life-cycle and permanent income theories of Modigliani and Friedman (Box 1). Thus, the European integration process acts as an essential trigger for permanent income growth of Romanian households. Expectations of higher disposable income will be perceived by households as a permanent shift in the utility level provided by consumption growth. On the other hand, such a shift in consumption is more likely to be achieved in the near term by increasing indebtedness or by using accumulated resources.

Box 1

Life cycle theory and permanent income hypothesis

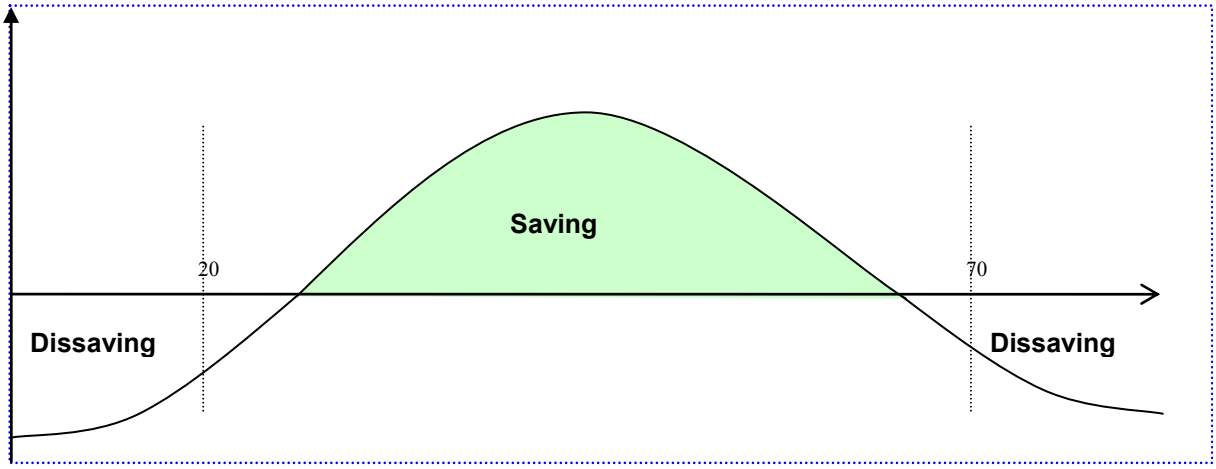
Keynes' theory on consumption (1936) established a bound between global consumption and income: "The fundamental psychological law that we certainly can count on, a priori, due to knowledge about human nature and, at the same time, a posteriori, due to detailed information resulting from experience, is that on average and most of the time, people tend to increase consumption as their income grows, but not with an equal amount". As consequence, Keynes considered that, as the income grows, people save more, resulting in an increase of savings as a percentage of income.

Kuznets (1942) showed that Keynes' theory could not be sustained by US historical data: although household income had significantly grown, savings (as a percentage of GDP) had not. This contradiction regarding savings behaviour was analysed by Modigliani and Brumberg, who developed a new theory on savings published in 1954 - life-cycle theory. The main hypothesis of this theory is that saving incentive of households savings behaviour derives from the need to ensure resources for consumption needs after retirement. Thus, household saving is not only influenced by the current level of income, but also by its wealth, expectations of future income and age.

At a macroeconomic level, this theory asserts that: (i) savings depend on the income growth and not on the level of current income; (ii) savings are affected by the population growth, and also by its age breakdown; (iii) savings are influenced by the wealth of households, and, as a consequence, by the structure of interest rates.

Friedman (1957) developed a permanent income hypothesis, arguing that households establish their consumption pattern on the basis of permanent income, and not on current income. Permanent income is computed as a sum of current income and the weighted average of future incomes. The weights decrease as we go further into the future (adaptive expectation hypothesis).

A conclusion from both Modigliani and Friedman's theories is that in the first and the last part of their lives, households consume more than they save in order to maintain a relatively constant life standard. This theoretical behaviour is modified in real life by some liquidity constraints further details in this and in the third section).



Expectations of future income may follow a steep and increasing slope due to significant differences between Romanian average gross salary income (at the end of 2004 the average Romanian gross salary was only 233.7 EUR) and the corresponding values of EU countries (Table 1.2).

Changes in consumption behaviour could increase the risk to financial stability by increasing levels of indebtedness or dissaving. The other aspect to consider is the change in the composition of consumption. An increasing share of consumption out of the household income could trigger a decrease in the weight of goods that are considered as “normal” (goods that have positive but lower than unity income elasticity - for example food products) in favour of “superior” goods (goods described by marginal higher than average propensity to consume). These goods are more prone to be financed by loans compared to “normal” goods, thereby increasing households’ indebtedness. Moreover, if the Romanian economy is not able to supply these products (and services) at the required qualitative and quantitative levels, consumption might be satisfied through imports, further affecting the current account deficit. Financing those goods with foreign currency loans raises also the issue of households’ ability to manage foreign currency risk.

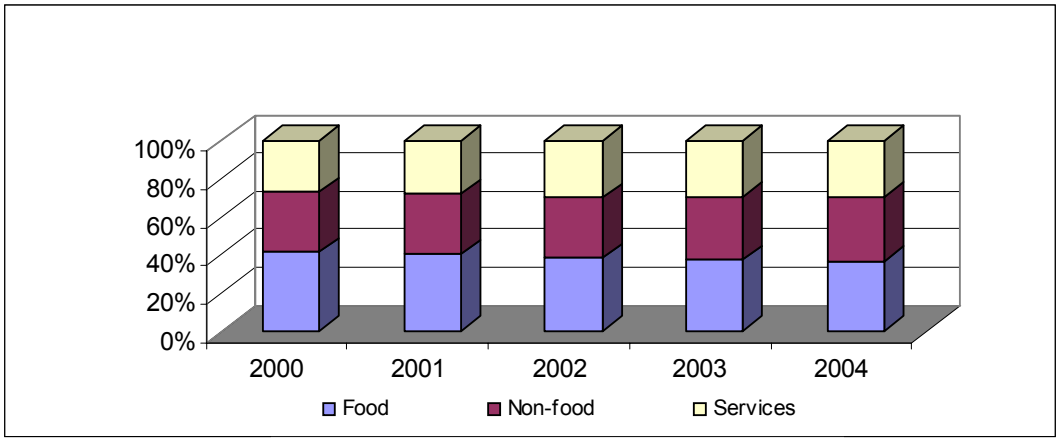
The structure of households’ money expenditure has altered with the weight of expenditure on food decreasing in favour of services and non-food expenses. Graphs 1.1 and 1.2 reveal a continual decrease of food expenses by 2.8 pp, between 2000 and 2004, in favour of non-food expenses (increasing from 31.8% to 33.6% between 2000 and 2004) and services expenses (26.9% in 2000 compared to 27.9% in 2004). Analysis of employees’ consumption budget shows that the decrease of food expenses was slightly higher (4.6 pp) than services expenses (growing by 2.3 pp up to the level of 29.5% of total consumption in 2004) and non-food expenses.

We anticipate that these changes in the structure of the households’ money expenditure will go on even further, for at least the following reasons:

- On one hand, the process of European integration enhances Balassa-Samuelson effect which leads to an increase in the cost of services while the quantity of consumed services will continue to grow (as a consequence of higher standard of living). A distinct case comes from expenditures on utilities as their prices will have to adjust to the similar levels of EU by I 2007, which will lead to a hike in these prices;
- It is possible that the prices of food products will grow at a smaller pace considering these circumstances and due to decreasing trend of inflationary expectations. Thus, the weight of food product expenses in total households’ consumption will diminish even further;

Graph 1.1

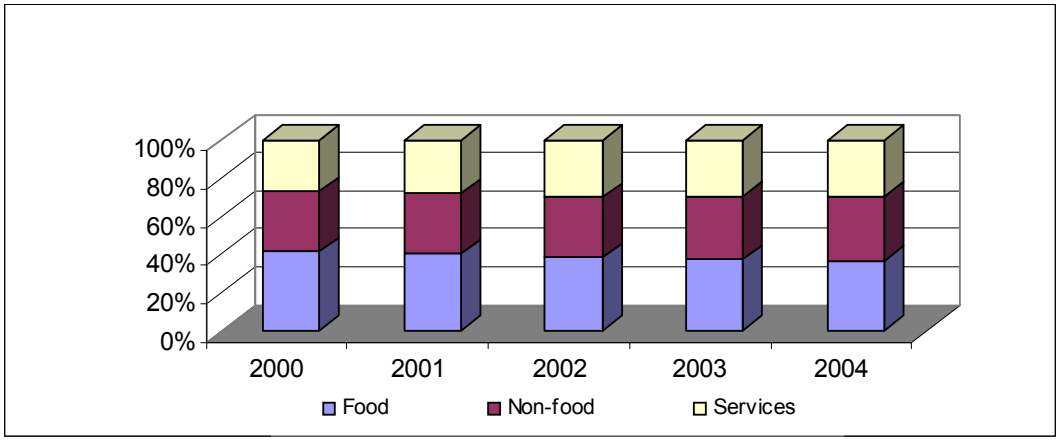
Structure of money expenditure for households' consumption - total



Source: National Institute of Statistics.

Graph 1.2

Structure of money expenditure for households' consumption - employees



Source: National Institute of Statistics.

- We consider that non-food expenditures will also grow as the households' consumption will be directed towards improvement in their standard of living by increasing the consumption of durable goods (see section 2).

Regarding the household savings, its current unfavourable dynamics could affect financial stability if the specific functions of savings cannot be fulfilled. These functions act at two levels: at macroeconomic level, households' savings represent an important source of financing companies' investments and in reducing budget deficit; at microeconomic level, lower savings could negatively impact household standard of living, specially of the retired people.

Considering the significant amount of capital inflows of the recent years that are sterilized by National Bank of Romania (NBR), we can conclude that for the moment, there is no significant risk at a macroeconomic level.

However, there is some risk at microeconomic level as the number of contributors to the actual pension system is significantly lower than the number of beneficiaries. In this respect, there is a need of speeding up the implementation of Pillar II and III for private pension funds (Box 2).

It should be noted that the savings placed in public pension funds are weak substitutes for wealth since they are not liquid. Savings as contributions to the public pension funds cannot be used as collateral before retirement and cannot have the function of safety saving. Thus, optimal household savings should be higher than the savings in the public pension funds.

So far, the pension system in Romania, as a defined benefit system, has been a reliable source of income for retirement which meant that there was a lower incentive to have additional savings during the active working life. At the same time, households did not need to actively manage the financial risks for the amounts saved through the public pension fund. The process of restructuring the current pension system will highlight those two aspects, which raises the issue of initiating measures to improve households' financial education.

Box 2

Restructuring the current pension system in Romania

For the moment, the Romanian pension system is exclusively based on Pillar I, the usual term for public pension system. The features of this pension system creates inefficiencies in its ability to fulfil its role of granting social benefits to the retired people. The public pension system also includes other types of short term social benefits, such as: maternity leave, medical leave, child rearing, death benefits, etc. These characteristics, when combined with a significant increase in the number of retired people in the last decade as well as the increase in arrears of social contributions, have resulted in a severe underfinancing of the system, which in a medium term could impose serious constraints on social insurance budget.

The alternative solution for improving the pension system and in avoiding a major crisis is to develop private pension systems. In 2004, Pillar III and II have been introduced by Law no. 294 regarding occupational pensions (in force by 2005) and Law no. 411 regarding private managed pension funds (in force by 2006).

Pillar II, represented by private managed pension funds, is mandatory for people up to 35 years and optional for people between 35 and 45 years. A percentage of the contribution collected by the public pension system is used to fund this pillar. Over the short and medium term, the social insurance budget deficit could grow as a consequence of applying the new Pillar, with an impact on the consolidated budget.

Pillar III comprises of optional occupational pensions. The contributions of employees and employers are not predetermined. The law only establishes that both partners qualify for a yearly fiscal deductibility for individual contributions of 200 EUR. For Pillar III there are no limits on the age of contributor, but the law provides a minimum contribution period of 5 years.

Although the private pension system has developed with a significant delay compared to other Central and Eastern-European countries, we should appreciate the benefits of this system. A first qualitative consequence is the abandoning of "defined benefits" approach in favour of "defined contributions" approach: in other words giving up the strategy of promising certain amounts for the future pensions in favour of establishing the level of contribution without benefits guarantee.

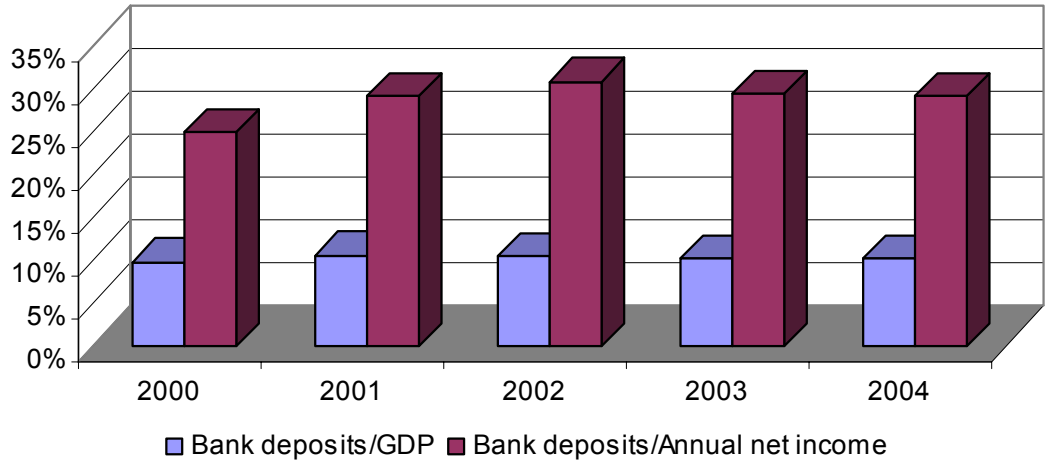
The system of private pensions will encourage positive behavioural and educational changes with a forward-looking and responsible attitude towards retirement. Acknowledgement of the fact that the public system cannot offer comprehensive financial solutions for retiring people could trigger further development of the private pension system.

The private pension system will produce important capital flows that could be channelled to viable projects and would stimulate economic growth. A sound development of private pension system could also overcome the pressure on public budget.

Bank deposits of households stabilized at around 10% of GDP and 29% of net income (Graph 1.3). Comparing the last value with the average of UE (9.25%) we may conclude that either the net income of Romanian households is significantly undervalued, or the future dynamics of net income will be much more pronounced than the savings rate.

Graph 1.3

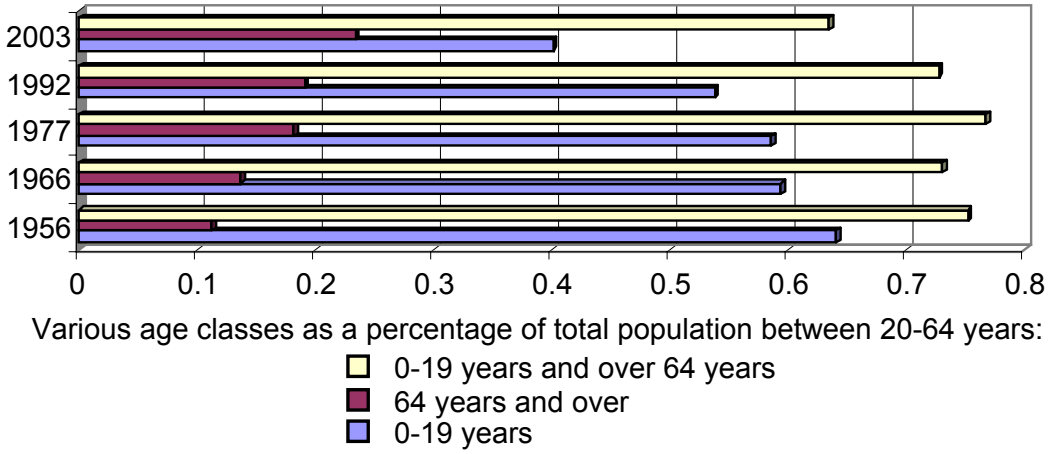
Households' savings



National Institute of Statistics and own calculations.

Graph 1.4

Demographic pressure of ageing and young people



From a financial stability point of view, the second hypothesis raises more concern since there are some aspects of the macro economy that sustain the need for increasing savings. Given the Romanian *demographic evolution*, higher savings is necessary as the increasing weight of older people in the population comes with a decline in savings, as the propensity to save among the retired people tends to be lower.. Similarly, an increase in the number of young people not yet working, diminishes the savings rate since the parents would assign a significant part of their income to support the children. From Graph 1.4, the evolving demographic proportion of ageing population as well as the changing dynamics of under aged population groups can be seen. *Average life expectancy* of Romanian population could be another factor in favour of an increasing the savings rate of households during the active working life of the earning members in order to maintain a constant level of consumption over the long run.

Interest rate has a double effect on savings. First, diminishing interest rate encourages present consumption and does not favour saving for future consumption. Second, lower interest rates

require a higher saving rate in order to achieve an established savings threshold. The implications of substitution and income effects will be further considered in the next section.

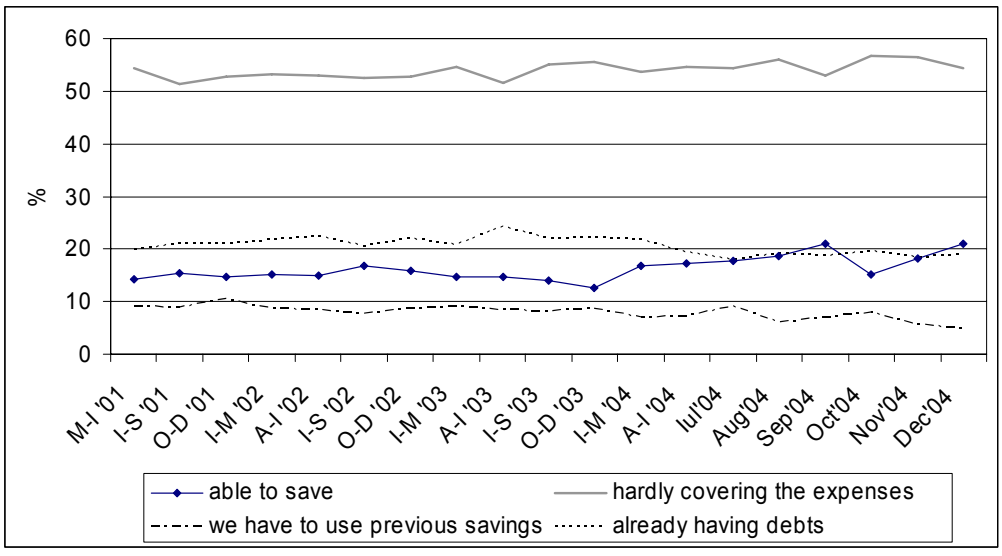
It is also necessary to consider the impact of the *spread* between loan and deposit interest rates. In Romania, these spreads are quite significant. The higher the spread, the more inefficient it becomes for households to be both debtor and creditor at the same time, since the households need to have a higher savings rate in order to remain net creditors.

Households *wealth* is another aspect that influences saving behaviour. The market value of wealth could change either due to a different saving behaviour, or due to the volatility of the asset prices. The latter effect is likely to be more important for the households' non-financial assets (mostly housing), considering the low weight of financial instruments in the wealth of households. Moreover expectations of a decreasing trend of interest rates would not lead to higher savings income.

The expectations of higher costs for medical assistance and education could become another reason of concern for the households. We expect that the effort of the Romanian households to provide for these expenditure will be much more significant in the future. The IMF (2005) warns about cutting of the governmental subsidies for medical care and education expenses in the context of pressure for lower budget deficits. From a financial stability perspective, monitoring the impact of medical assistance and educational expenses is important as these expenses are weighing more and more in the households' budget. Households will be forced to change their consumption and saving behaviour in order to provide for these expenditure. Taking into account the demographic profile presented in Graph 1.4, we can conclude that, in the short and medium run, a higher impact could come from the changes in medical assistance expenses rather than education.

Graph 1.5

The sentiment on family financial stance



Source: GfK Romania, 2005.

As a consequence, there is a strong need for increasing the households' savings in order to efficiently cope with higher required resources. The households' sentiment towards the ability to save (Graph 1.5) is slightly increasing, but still remains to a low level (21% of total, December 2004). Most people modelled their current expenses such as to be covered by income (almost 55%, December 2004), while households that were in deficit or were perceived as net debtors accounted for 19% at the end of 2004.

1.2 Household balance sheet and disposable income

At a microeconomic level, households play a double role:

- As a creditor, household decisions of reallocating the financial assets portfolio between bank deposits, securities or other forms of investments, such as those offered by insurance companies, mutual funds etc., encourages competition for households' resources. The impact of such decisions have consequences for financial stability especially when: (i) competition between entities induces a higher risks in the financial system that cannot always be efficiently managed and (ii) rapid turnover of financial assets portfolio causes liquidity pressure and price volatility.
- As a debtor, households are usually indebted through consumer credit or mortgage loans. If the indebtedness ratio and the exposure to different creditors reach a critical point, households' incapacity to service the debt is passed on through the channel of creditors' balance sheets, affecting financial stability.

Table 1.3

Households' income and expense statement and balance sheet

Income and expense statement	Balance sheet
1. Wages and salaries from employment	**7. Total assets (= 8 + 11)**
2. Property income	8. Non-financial assets (= 9 + 10)
3. Current transfers (e.g. from government)	9. Commercial and residential real estate
4. Other income	10. Other assets
5. Less taxes including social security contributions and other current transfers made	11. Financial assets (= from 12 to 16)
6. Gross disposable income	12. Currency and deposits
	13. Debt securities
	14. Shares and other equities
	15. Financial derivatives
	16. Other assets
	17. Total liabilities (= 20 + 21)
	18. Loans
	19. Other loans
	20. Debt
	21. Financial derivatives
	22. Net wealth
	23. Balance sheet total (= 17 + 22 = 7)

Source: IMF, *Compilation Guide on Financial Soundness Indicators*, 2004.

Households should be considered as entities that follow the same rules of management as other companies. The most important aggregate indicators that characterize households' financial health are: (i) net wealth and (ii) gross disposable income. These indicators are synthetically summarized by households' income and expense statement and households' balance sheet (Table 1.3).

1.2.1 Household balance sheet

There are two features to discuss regarding households' balance sheet: the size and the risk of each item of the balance sheet and the risk mitigating possibilities by diversification effect. Thus, if the assets from the portfolio are negatively correlated, the general risk is reduced.

Net wealth

The households' net wealth is composed of financial and non-financial assets. These assets can be divided into: (i) market sensitive, e.g. equities, bonds, mutual funds or real estate and (ii) less market sensitive, e.g. bank deposits.

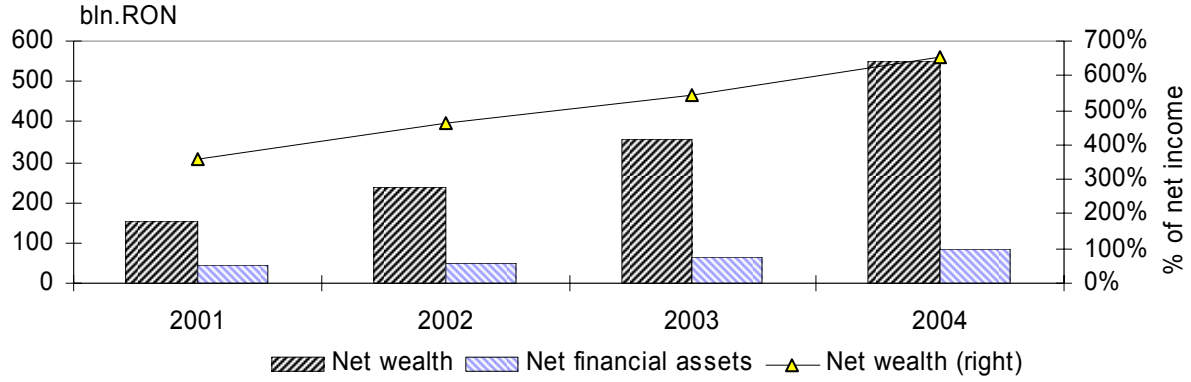
The net wealth grew significantly in the last years (Graph 1.6). This outcome should be further analyzed for at least two reasons:

(i) The lack of statistical data on capital and real estate market entails the use of a number of working hypotheses[4]. The hypotheses have been chosen following a prudent approach towards financial stability, therefore underestimating assets and overestimating liabilities.

(ii) The favourable dynamics of net wealth is especially caused by the hike in non-financial assets value; However, Romanian real estate market has very low liquidity thereby generating distortions in assessing effective net wealth.

Graph 1.6

Net wealth and net financial assets



Source: Own calculations.

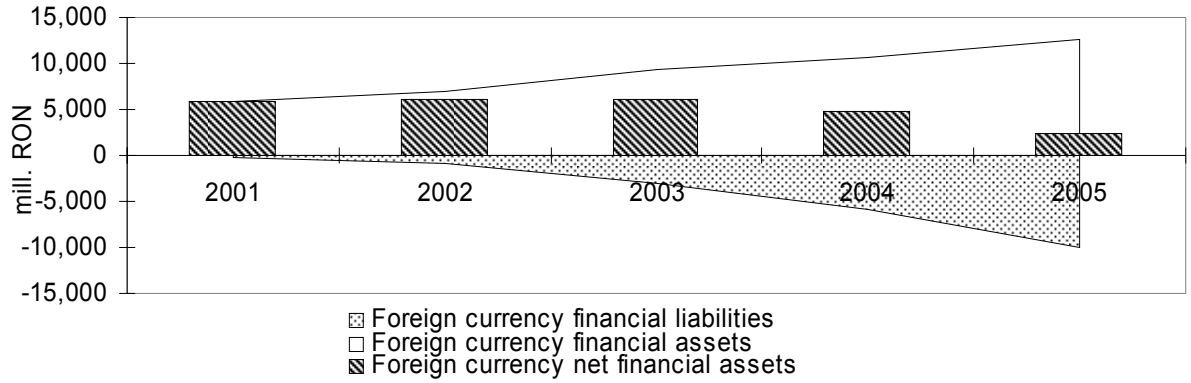
Net financial assets

The financial assets portfolio has very low diversification with currency and bank deposits accounting for 86% of total financial assets as of March 2005. Direct and indirect holdings of money market instruments were even higher because the portfolio of mutual funds has currently a risk adverse orientation. This conservative structure of financial assets protects households against possible negative volatility of the capital market.

[4] For example, we consider that households hold 10% of BVB and RASDAQ market capitalization, starting from households investment of 15% into OPCVM net assets in December 2004 and that companies and financial institutions are much more involved in capital market transactions compared to mutual funds.

Graph 1.7

Households' foreign currency position



On the other hand, this structure could cause problems when the interest rate decreases, as the market value of assets would increase at a slower pace compared to liabilities. Using duration as a tool for analysis, it could be perceived that, by the end of March 2005, the duration of households' assets was 0.458 years, whereas the duration of liabilities was 0.736 years[5]. The modified duration of assets was smaller than that of liabilities which could cause systemic risks when the indebtedness ratio increases[6].

The evolution of assets and liabilities sensitivity by simulating a reduction of up to 5.4 % for assets and 6.6 % for liabilities is presented in Table 1.4.

Table 1.4

The duration of assets and liabilities

	Assets				**Liabilities**			
Interest rate (%)	10.4	8.0	7.0	5.0	24.6	22.0	20.0	18.0
Duration (years)	0.458	0.460	0.460	0.461	0.736	0.736	0.736	0.736
Modified duration (%)	0.415	0.426	0.430	0.439	0.590	0.603	0.614	0.624

Source: Own calculations.

Another important issue for financial stability is the foreign currency risk faced by households. Households hold more foreign currency denominated assets than liabilities which results in a long but descending foreign currency position. An appreciation of the domestic currency has a negative impact on the households' financial wealth. The recent appreciation trend, especially starting from 2004, promoted the increase of foreign currency

[5] We considered that the value of liabilities and assets with a maturity of less than one month is not significantly affected by interest rate volatility. Moreover, loans and deposits with a maturity higher then one year have been considered as having an effective maturity of less than one year, since usually fixed interest rate contracts provide a "resetting" clause that is activated periodically in order to cover money market volatility.

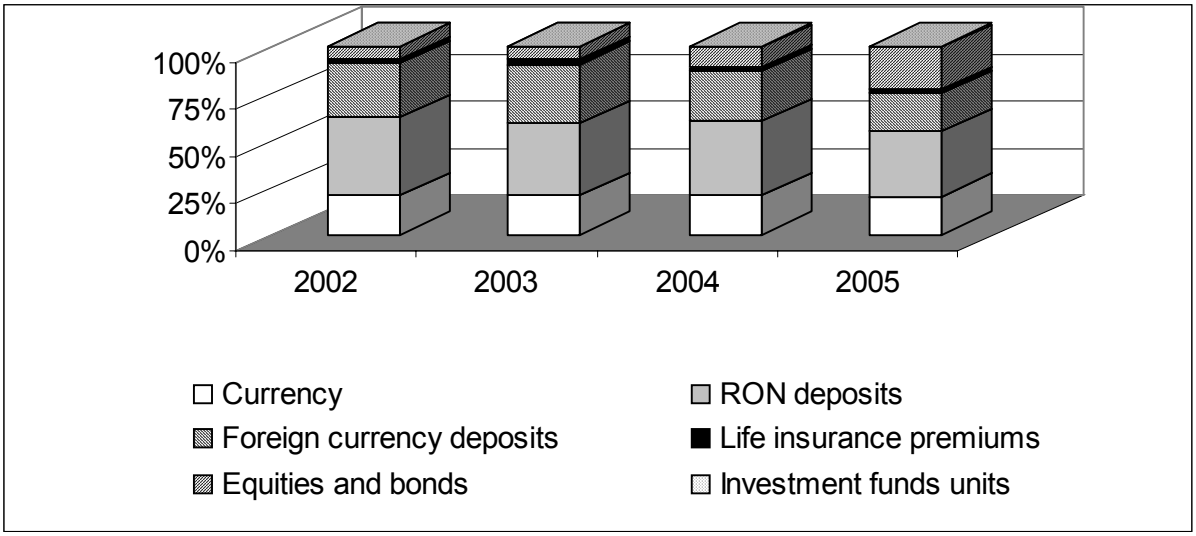
[6] The sensitivity of liabilities could be even higher in reality compared to assets as in computing duration we used interest rates reported by banks and not effective interest rates (including different fees) which are higher.

denominated liabilities, leading towards the reduction of long position in foreign currency. We think this trend is going to last (Graph 1.7) and it could result in an increase of domestic currency denominated deposits and foreign currency loans.

The breakdown of assets reveals some changes between December 2002 and March 2005 (Graph 1.8): (i) a significant growth of equity and bond holdings, and (ii) a slight increase in domestic currency denominated bank deposits. Holdings of currency and life insurance premiums stabilized at a relatively constant level (20% and 1.9% of total).

Graph 1.8

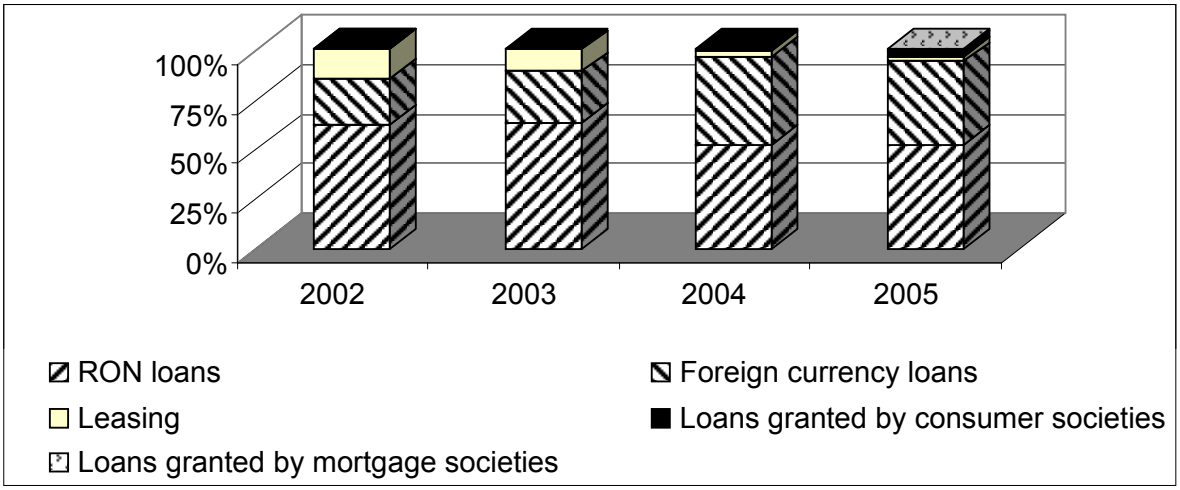
Financial assets breakdown



Source: CNVM, CSA, BVB, RASDAQ, own calculations.

Graph 1.9

Financial liabilities breakdown



Source: CNVM, CSA, BVB, RASDAQ, own calculations.

Comparing the structure of Romanian households' financial assets (for 2004) with the similar Euro area figures (for 2003) reveals significant differences:

(i) Currency and bank deposits holdings of the Romanian households account for 86.3% of total financial assets compared to 33% for the Euro area;

(ii) Financial equity was almost 30% for the Euro area, while the Romanian households had invested 11% of their balance sheets in this type of asset;

(iii) The largest spread comes from the life insurance premiums portfolio: in Euro zone households it accounted for 28% of financial assets, while in Romania the level is very low (2%);

(iv) The units of investment funds represented 10% in the Euro zone, while the same investments in Romania represented 0.18% of households' balance sheet.

The structure of households' assets will further alter as the Romanian financial market develops and the confidence level increases. Changing the households' portfolios entails some risks which need to be properly managed, which is another argument in favour of authorities' involvement in improving financial education of households.

The structure of households' financial liabilities changed in a more significant way (Graph 1.9). Foreign currency loans doubled their weight in total liabilities (reaching 53.7%). The weight of RON denominated loans follows a decreasing trend, possibly caused by a strong real positive level for loan interest rates.

In conclusion, the structure of households' financial assets and liabilities raises some financial stability concerns arising from interest rate (signalled by duration) and foreign currency movements (signalled by foreign currency position). The current trend of increasing weight of equities and bond holdings in households' balance sheets could introduce additional risk arising from capital market volatility. Regarding holdings of non-financial assets (real estate), the increasing price of those assets improved households' net wealth. On the liability side, there is an increasing trend of indebtedness through growing mortgage commitments.

1.2.2 Disposable income

Wages are the main component of total net income of the Romanian household, increasing from 56% to 62% between 2000 and 2004 (Graphs 1.10 and 1.11). Other income comes from holding financial or non-financial assets (interest, dividend or rent) or from government budget transfers (pensions, allowance for children etc.).

The monthly net income of households grew (Table 1.5), in both nominal and real terms, especially due to significant increases in the flows of wages and social provisions.

As we mentioned in section 1.1, households expect that the growth trend of wages will be maintained or even gain higher momentum. These expectations on the demand side of labour market could cause problems on the supply side by transferring potential systemic risk from households to employers. For the moment, the upward trend of wages is correlated with the industrial labour productivity (Graph 1.12). Extending the analysis to all the sectors of the economy reveals the need to carefully monitor the movement of these two factors.

The Romanian households face an increase in risks on both the asset and liability side. The risks emerging from the asset side are mainly due to the changes in the portfolio structure and the increase in volatility of prices and yields. The risks stemming from the liabilities side are due to the growth of indebtedness ratio. This is very important from a financial stability point of view and we will further analyse these issues in subsequent sections.

Table 1.5

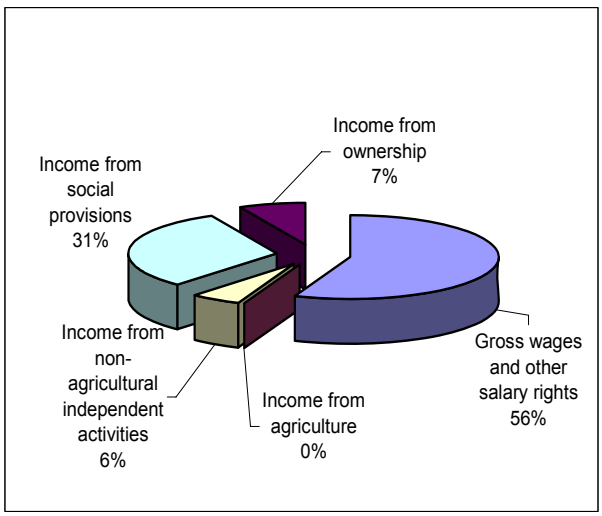
Total income and disposable income (millions RON)

	2000	2001	2002	2003	2004*
Total income	**2798.68**	**4052.51**	**4986.09**	**6170.28**	**7976.32**
Money income of which:	1903.10	3015.06	3799.40	4621.54	6045.75
Gross wages and other salary rights	1015.92	1819.57	2313.54	2764.28	3556.04
Income from agriculture	0	0	204.42	259.15	326.42
Income from non-agricultural independent activities	100.75	129.68	124.65	160.42	251.06
Income from social provisions	565.33	790.23	977.27	1184.69	1537.61
Income from ownership	128.73	162.10	14.95	18.51	46.93
Equivalent value of income obtained by employees and receivers of social provisions	22.38	36.47	54.84	104.89	195.57
Equivalent value of consumption of agricultural products from own resources	873.19	1000.97	1131.84	1443.84	1734.99
Money expenditure on taxes, contributions, dues, fees	168.63	521.50	690.79	721.66	964.40
Net income	**2630.05**	**3531.00**	**4295.30**	**5448.61**	**7011.91**

Source: National Institute of Statistics, 2004; * provisional data.

Graph 1.10

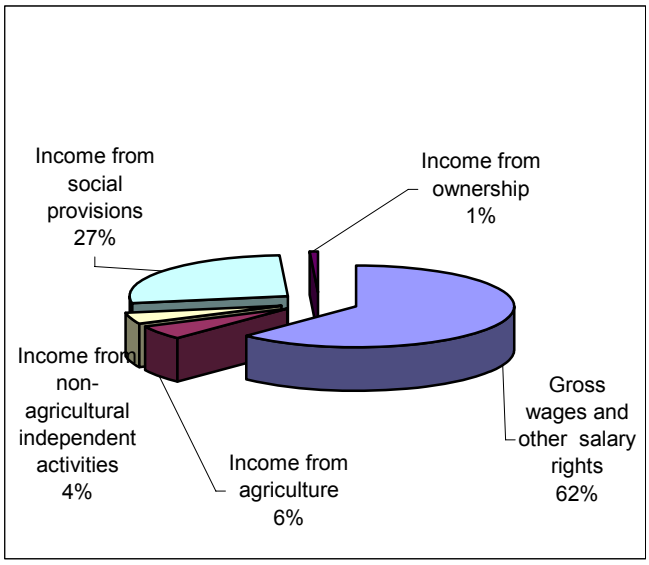
The structure of money income, 2000



Source: National Institute of Statistics.

Graph 1.11

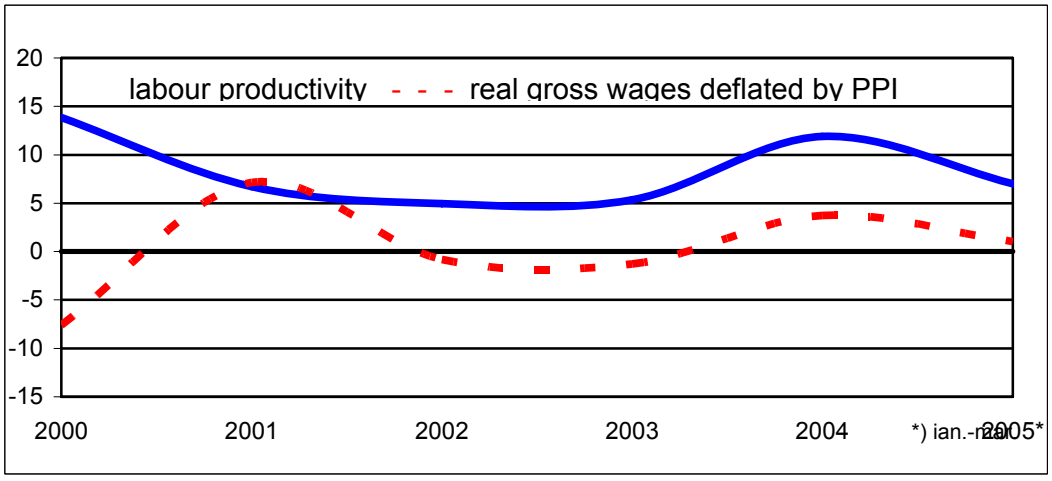
The structure of money income, 2004 (provisional data)



Source: National Institute of Statistics.

Graph 1.12

Real wages and industrial labour productivity



Year to year percentage change. Source: National Institute of Statistics.

2. Household indebtedness ratio - trends, risks and challenges

2.1 Dynamics and trends of household indebtedness ratio

In our view, the focus should be more on the risks emerging from the liability side of the households, rather than the asset side. The current trend of increasing indebtedness ratio could increase the probability of households' default, with negative effects on the creditors' balance sheets and on the aggregate demand.

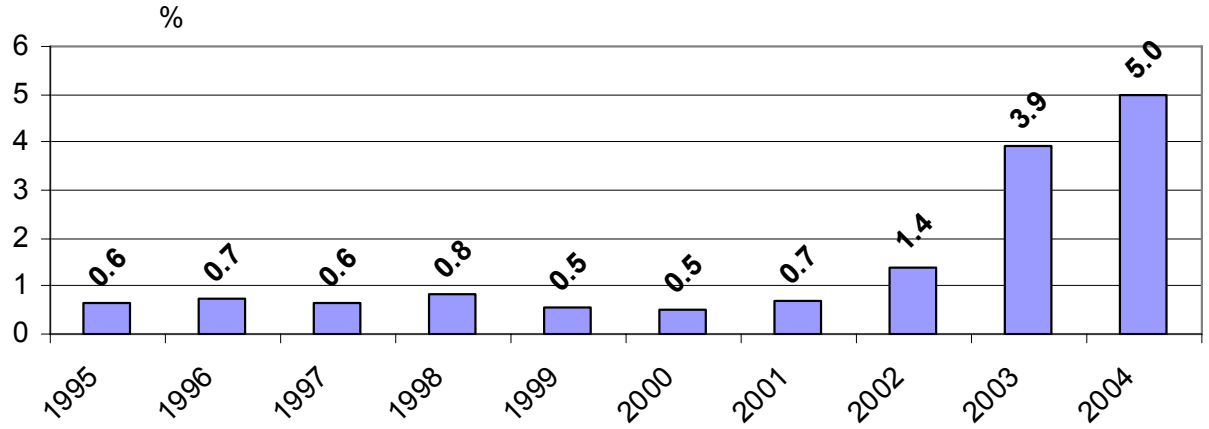
It is not the level of indebtedness so much as its rate of growth. The share of credit to GDP counted for almost 5% by end 2004, significantly lower than the EU values. The pace of

household credit growth registered booming values as compared to the EU thresholds, ie almost eight times (as a share of GDP) between 1995 and 2004 (Graph 2.1 and 2.2).

Households achieved this level of indebtedness especially through consumer credit. The structure of indebtedness does not change significantly (in March 2005 consumer credit represented 70.7% out of total household credit, falling from 73.3% reached in January 2004 - Graph 2.3). In the EU countries, the structure of indebtedness is typically the opposite (Graph 2.4). In Romania there is plenty of scope for the mortgage loans to expand, changing the above-mentioned proportion. These developments, despite some positive effects, may raise concerns from a financial stability point of view, as an increase in the demand for real estate will be passed on to even higher increase in real estate prices.

Graph 2.1

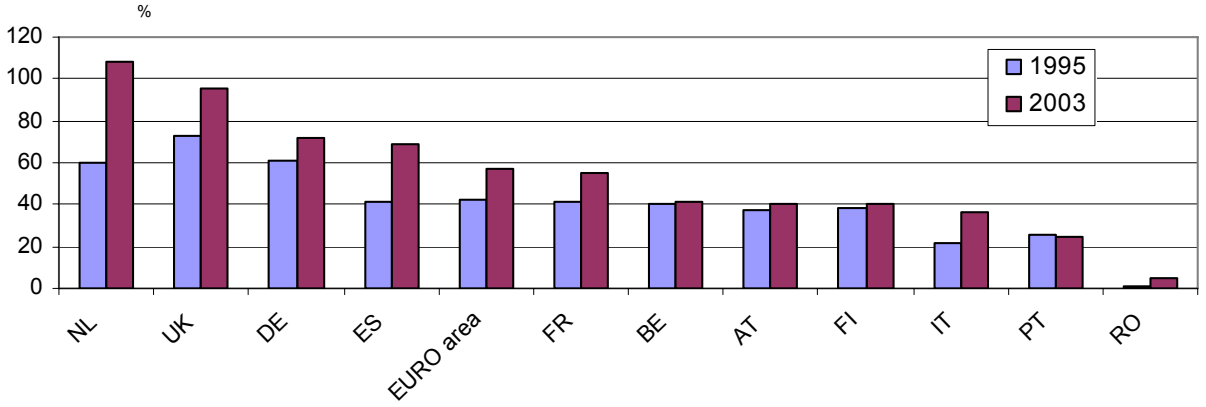
Romanian household loans as a percentage of GDP



Source: Own calculations.

Graph 2.2

Household loans as a percentage of GDP in some European countries



Source: ECB Financial Stability Review, 2004; own calculations.

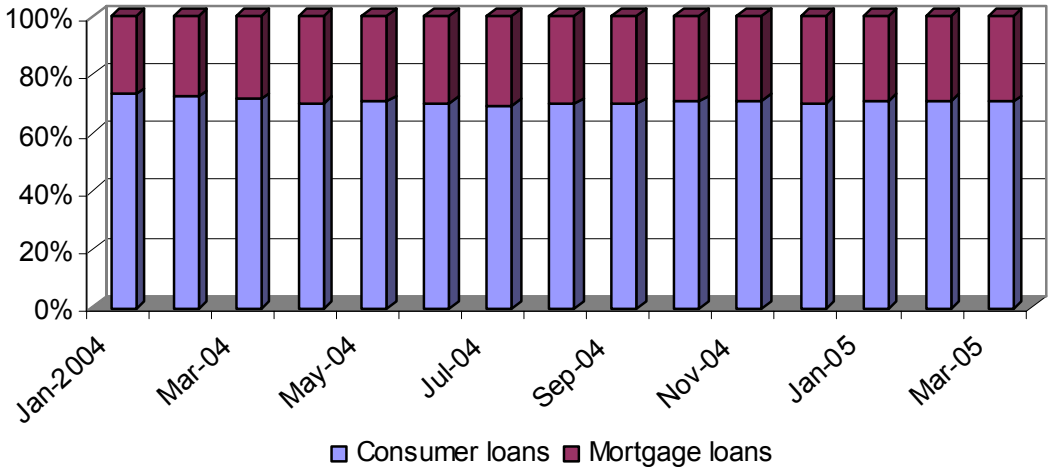
In the short run, however, we anticipate that households will continue their indebtedness in order to meet their consumption and durable goods needs. As the household incomes rise and the housing supply continues to grow, a shift to mortgages can be expected.

However, banks are not very interested in a sudden major change in the household indebtedness structure, because consumer loans, though less secure and with a theoretically higher risk profile, brings greater profitability due to higher interest rates. Moreover, consumer credit elasticity is weaker given the decreasing interest rates (the typical example being credit cards). This also explains why banks are strongly financing this area.

The worst case scenario for mortgage loans, from the financial stability point of view, is a significant correlation between the increase in the interest rate, the decrease in real estate prices and the corresponding decrease in the ability of households to service the debt.

Graph 2.3

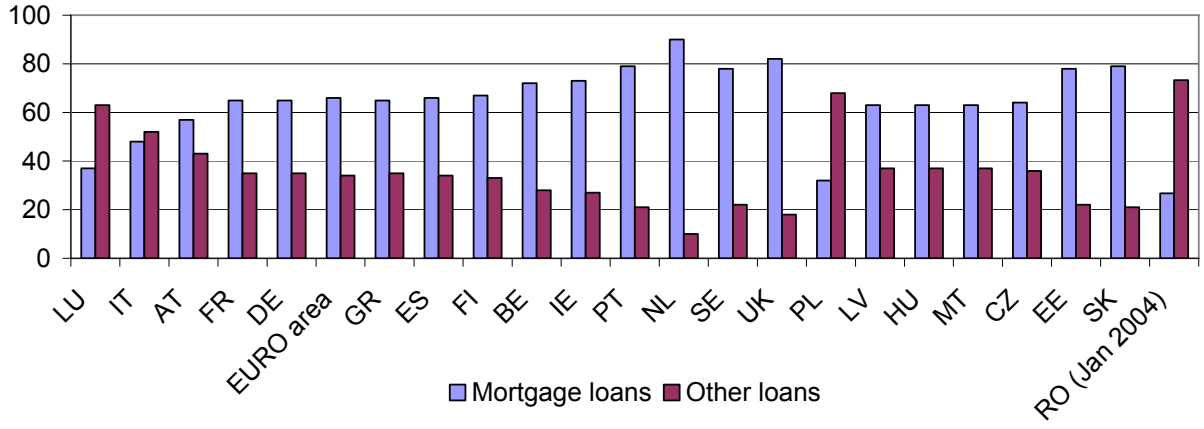
The structure of household loans in Romania



Source: NBR own calculations.

Graph 2.4

Household loans breakdown for EU and Romania (December 2003) %



Source: ECB (2004); NBR calculations.

2.2 Factors contributing to the increase of household indebtedness ratio

Both demand and supply factors triggered the evolution of indebtedness. The main factors are further discussed below.

2.2.1 On the credit demand side

2.2.1.1 The low level of households' endowment with durable goods and real estate

International statistics rank Romania among the last in the EU as regards household durable goods endowment (Table 2.1). However, the improving economic environment allows for fulfilling this type of needs. Credit suppliers are already exploiting the niche of financing electronics, home appliances and cars, fuelling the dynamic of the consumer loans.

Table 2.1

Household endowment with durable goods

Country	TV Sets/1000 inhabitants in 1999	Computers/1000 inhabitants in 2002	Automobiles/1000 inhabitants in 2001
Romania	**366 (2003)**	**69.19**	**118 (2003)**
Bulgaria	372	51.92	264
Hungary	503	108.35	244
Poland	239	105.65	272
Czech Republic	366	177.44	344
Estonia	373	210.33	298
Latvia	394	171.75	249
Lithuania	554	109.75	326
Cyprus	275	269.89	399
Malta	660	255.05	497
Euro area	na	**317.16**	na

Source: National Institute of Statistics, Eurostat, Joint research Centre, World Bank.

2.2.1.2 The increase in wealth and disposable income of households

As highlighted in the previous section, the net wealth of households has increased during the last few years with the price effect for real estate contributing significantly to this trend. The price variations might influence the decision to consume and invest, through income and balance sheet effect.

(i) the wealth effect decreases the will to save against a background of increasing asset prices. The households feel more secure and tend to consume more, thus resorting to credit.

In the future, this effect might become more important for Romanian households, taking into account the future increase in real estate prices (having a high share of the household wealth). However, up to now, we have certain doubts on the wealth effect in Romania because the fungibility of this type of wealth is debatable. The owners benefit from the increase in prices, but they can transform them to a liquid asset only if they trade them. Thus, there is a need for a third party willing to trade the asset. A solution to this problem is the development of a liquid secondary market, which could give the owners the possibility to direct their wealth returns to current consumption, turning to secondary mortgages or credits collateralized by that particular asset.

(ii) the balance sheet effect is felt especially in the case of the debtors borrowing in a foreign currency. It can be seen that, whenever a real appreciation of the national currency occurs there is a corresponding increase in the domestic value of the assets denominated in foreign currencies, and a reduction in the debt to asset or debt to disposable income ratio, giving the households a greater indebtedness

capacity. This effect can be seen in Romania, as it is propelled by the trend of real appreciation of the RON with respect to USD and EUR.

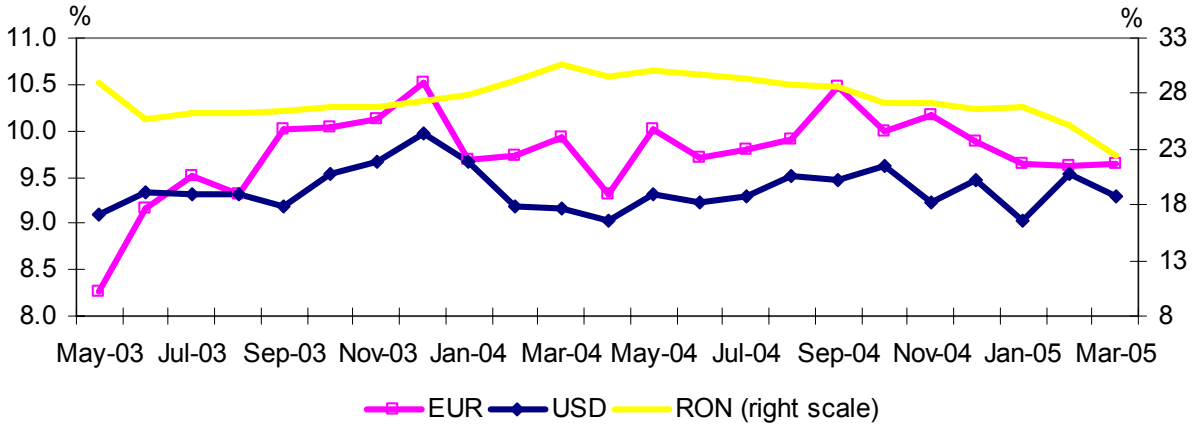
2.2.1.3 The improvement in macroeconomic conditions, especially diminishing interest rates

Loan interest rate is the cost of the borrowed funds and is the key element in determining the indebtedness ratio. Nominal interest rates specific to households' financing have maintained a high level (Graph 2.5), both for RON loans and for foreign currency loans as well, risk premium being considered significant. Effective interest rates are higher, especially for consumer loans and where the share of additional banking fees and commissions is important. It might be an explanation why the indebtedness dynamic has not reacted as expected with the change in nominal or real interest rates (see section 3).

A high inflation rate determines a high value for the nominal interest rates. Thus, the debt service as a share of income will increase as inflation grows. This ratio has a greater value at the beginning of the repayment process in a scheme with fixed constant instalments. Hence, the households' capacity to service debt, which is constrained by the ratio of debt service to disposable income, will increase as inflation decreases. However, beyond a certain threshold, a decrease in inflation rate will diminish less and less the nominal value of debt. At this point, the debt service to disposable income ratio remains more or less constant level as compared to the decreasing level of the ratio in a more inflationary environment.

Graph 2.5

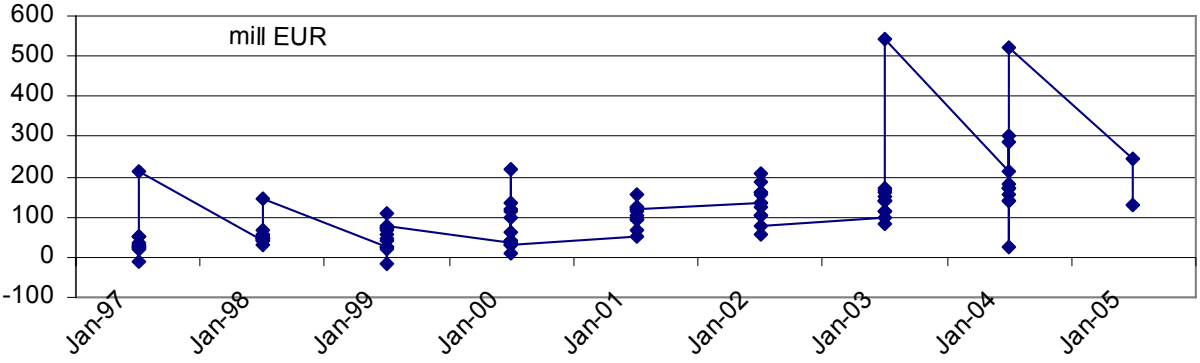
Household loans interest rates



Source: NBR.

Graph 2.6

Monthly current transfers



The effect of real interest rates on the level of indebtedness of households depends on the relative size of the income effect vis-à-vis the substitution effect. A decrease in the real interest rates reduces the income generated by the assets held by households, but it also lowers the cost of indebtedness and increases the value of discounted future incomes. If we take into account the demographical structure of Romania, we estimate that the decrease in the real interest rates has a positive effect on the households because the number of (i) elderly persons who live on savings compared to those dependent on pensions, (ii) those who dispose of a significant net wealth and (iii) those who are at the threshold retirement, is lower than the number of (a) young people, those who (b) contracted credit and (c) those who will contract credit in the future.

Further, economic growth and diminishing inflation have a positive impact on the expectations of the households. These developments further improve labour market conditions by encouraging the consumption through indebtedness.

2.2.1.4 The role of remittances

The amount of current transfers continuously increased in the recent years (Graph 2.6) reaching 2.5 billion of EUR at the end of 2004. The income sent by residents working abroad correspond to a stable source of capital inflow which has no procyclical pattern unlike other short term inflows. Moreover, the remittances autonomously finance the current account deficit.

Empirical research shows that remittances have the ability to improve the budget position of the receiver thereby sustaining the increase of food and durable goods consumption. However, from our point of view, it is still unclear whether the remittances cause an increase in indebtedness ratio (representing, for example, a down payment for obtaining a loan) or there is a negative causality (in sense that households do not borrow anymore since their consumption is covered by remittances). Moreover, the volume and dynamics of remittances have a particular importance for financial stability because the significant and sustained inflows of remittances could also have some negative impact through: (i) reducing the incentive to work; (ii) considerable appreciation of exchange rate and the real estate prices; (iii) decreasing the activity of national sectors involved in producing food and non-food products (*Dutch disease*).

2.2.2 On the credit supply side

2.2.2.1 Increased competition to gain higher market share

Household debt mainly stems from the banking sector (97%, by end 2004). Leasing and loan intermediary societies are relative new competitors for banks. These players are not yet specifically regulated and do not provide detailed statistical data, but have started to be very visible in consumer loans.

The competition between banks, fuelled by excess liquidity arising from foreign capital flows, lowered the limit for household to access credit. The low concentration ratio of assets, loans and deposits at the Romanian banks slightly reduced in 2004 compared to 2003, resulting in an expanding credit supply.

2.2.2.2 Retail loans profitability and the connected risks

The profitability divided by risk (Sharpe ratio) is higher for household loans than for companies. If we add up the additional fees and commissions, the conclusion points to a very profitable activity in lending to households. As we will further detail in section 2.3, the risks embedded in the household banking loans are decreasing.

2.2.2.3 Availability of Information about debtors

Along with the information available at the National Bank of Romania through a Public Credit Register, the banking sector has set up a private bureau to broaden the data on individuals. This data reduces information asymmetry on household financing. The creditors can better assess the risk profile of the debtor, reducing credit risk and increasing credit supply.

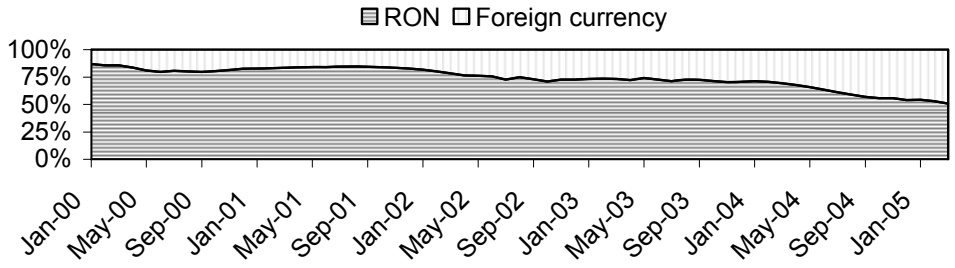
2.3 Risks arising from increased household indebtedness

Changes in the household indebtedness structure and volume could have important implications for financial stability. We found three trends worth focusing on:

(a) a significant increase in the ratio of foreign currency loans to total household loan (Graph 2.7). We expect the trend to continue, sustained by higher carry trade and domestic currency appreciation, triggering down the cost of foreign currency loans. However, it raises a concern that a scenario of significant and lasting depreciation of domestic currency might occur, which would affect the ability of the borrowers to service the debt, especially for the unhedged borrowers. In such a scenario, a higher weight of foreign currency loans in the creditors' balance sheet would amplify systemic risks[7].

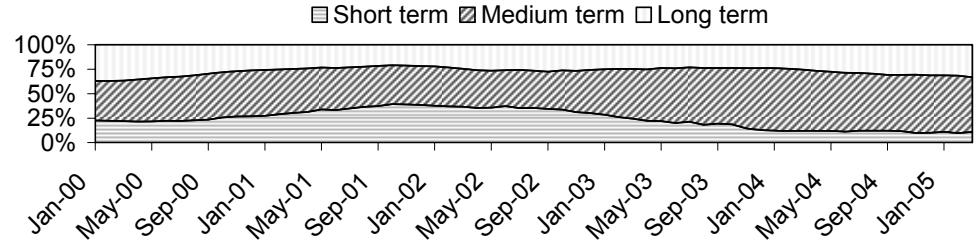
Graph 2.7

Currency breakdown of household loans



Graph 2.8

Maturity breakdown of household loans



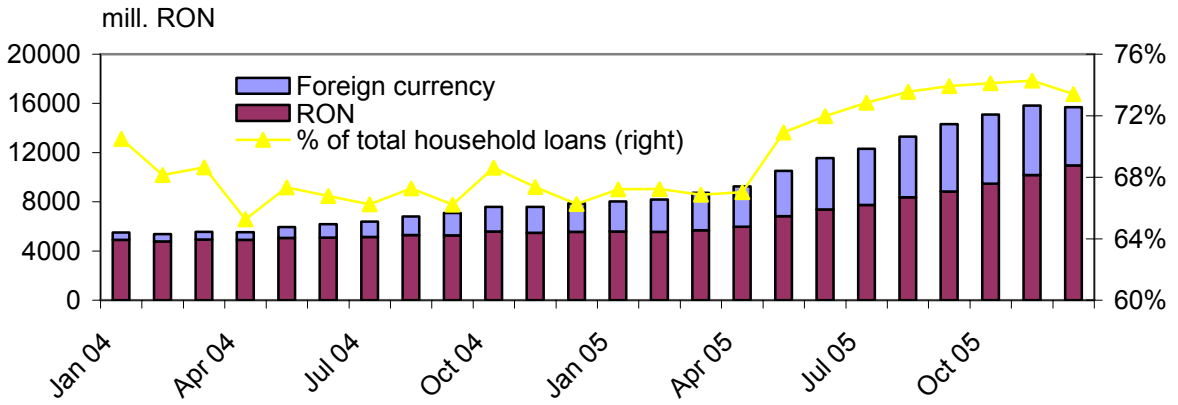
Source: NBR.

[7] The situation for leasing companies could be worse, because almost all the loans are foreign currency denominated.

Mortgage loans have the largest exposure on foreign currency, while consumer loans have the highest growth (Graph 2.9, 2.10). The negative effect caused by unhedged borrowers is smaller in the case of mortgage loans compared to consumer loans for two reasons: (i) mortgage loans are granted mostly on long term, (ii) sometime around 2014 Romania intends to adopt Euro.

Graph 2.9

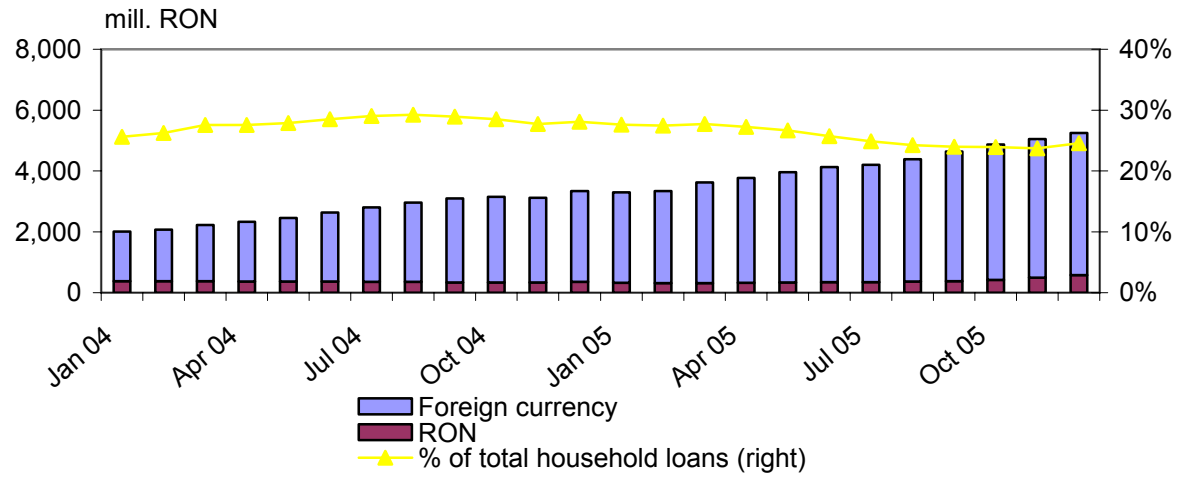
Consumer loan dynamic



Source: NBR.

Graph 2.10

Mortgage loan dynamic



(b) the maturity of loans is expanding:

The loans granted in the medium term (1-5 years) had the highest increase, reaching 56% of total household loans, by the end of March 2005. Long term loans (over 5 years) sum up to a third of total. Increasing maturity involves some risks, such as:

(i) Banks lack medium and long term resources which should finance long term loans. This could entail a potential maturity mismatch.

(ii) The larger the maturity, the higher is the probability of debtors' "myopia"; they tend not to care about interest rate and unemployment rate dynamics on the medium and long term.

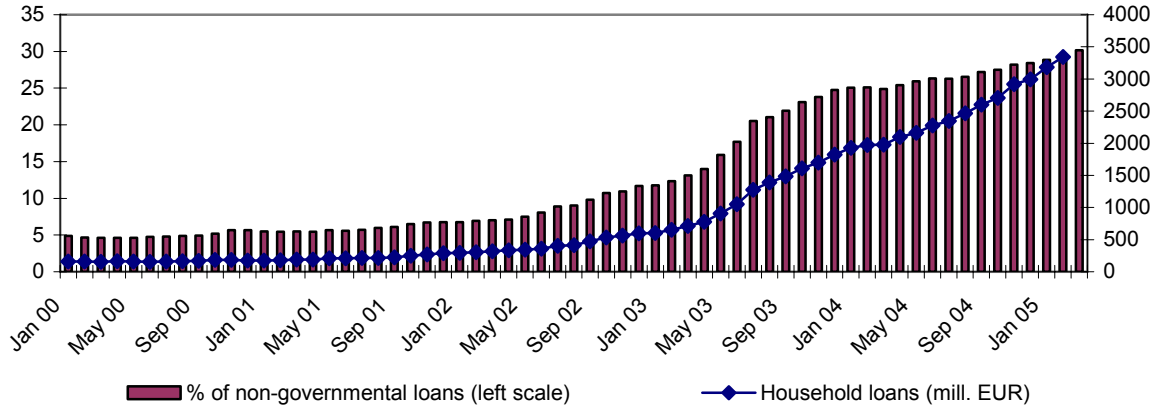
(iii) Obtaining a loan with a larger maturity allows for a higher indebtedness since the debt service burden decreases. This behaviour, characterized by an increase of the current consumption rather than the future one, could cause problems after a critical point.

(c) The weight of household loan in non-governmental debt continuously increases.

The percentage of household loans to total non-governmental loans grew significantly, even exponentially in 2003 (Graph 2.11). The percentage climbed from a very low level of 4.8%, in January 2004, to almost 30% in March 2005.

Graph 2.11

Household loan dynamics



Source: NBR, own calculations.

Although the dynamics of loans granted by Romanian banks is starting to match that of EU banks (where household loans reached 54.7% of non-governmental loans, March 2005), we consider that for the moment the households financial strength is not comparable with that of non-financial companies as to justify a rapid convergence with the European characteristics. Accordingly, we estimate that a more prudent approach for Romanian banks would be to focus in the future on corporate financing. In this case the household loans may grow, but not as much as corporate loans.

Besides the three possible risks described, we further present the risk profile of household loans by using the following indicators:

2.3.1 Past due loans

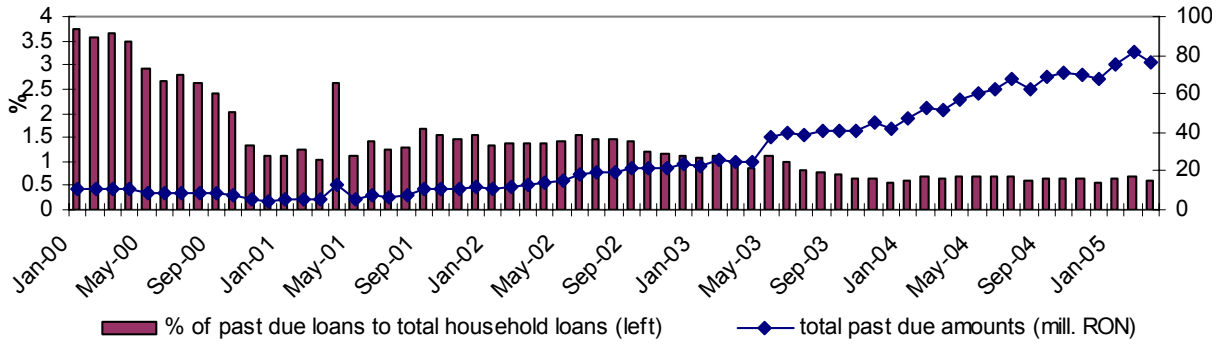
The past due loans (as a percentage of household loans) followed a downward trend bottoming at the level of 0.58% at the end of March 2005 (Graph 2.12).

These statistics should be cautiously interpreted since the ratio of past due loans could be currently underestimated as, household loans have recently grown strongly . These loans are usually longer term loans and are usually sound, being classified as standard credits. Therefore, newly granted loans lower the ratio of past due loans in total loans. Another reason for a prudent approach is the lag between the moment of granting the loan and the moment when the loan becomes past due.

Using modern risk management methods to assess the credit risk for retail credit, like probability of default, could be difficult because of the lack of statistical data.

Graph 2.12

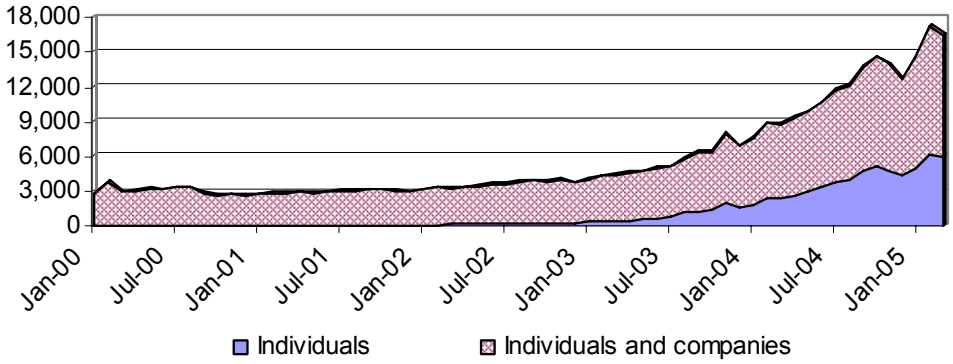
Household past due loans



Source: NBR, own calculations.

Graph 2.13

Number of individuals with past due loans



The number of individuals with past due loans significantly increased starting mid-2003, reaching 6000, representing 56.5% of total debtors with past due loans (Graph 2.13).

2.3.2 Geographical and institutional concentration

Geographical and institutional concentration of households' credit risk is diminishing. The Herfindahl index shows the geographical concentration decreased from March 2004 to March 2005 (Table 2.2), especially for the consumer loans. Household loans are still below the critical threshold (literature recommends a threshold of 1800 units). The strongest concentration is in Bucharest, which does not bring up significant concerns from a financial stability point of view, since in this location debtors have the highest incomes in the country.

Table 2.2

Geographical concentration of household loans

	Household loan			Corporate loans	Total non-governmental loans
	Total	Consumer	Mortgage		
March 2004	1174,5	1190,2	1158,7	2490,9	2117,1
March 2005	997,9	880,8	1337,9	2329,7	1875,8

Source: NBR, own calculations.

Using the same approach for institutional concentration we find that the concentration was relatively constant (but high) from March 2004 to March 2005 (Table 2.3). This dynamic was due to increased consumer loan concentration and decreased mortgage loan concentration.

Table 2.3

Institutional concentration of the household loan

	Household loan			Corporate loan	Total non-governmental loan
	Total	Consumer	Mortgage		
March 2004	1622,5	1589,5	2049,3	1103,9	1182,1
March 2005	1620,6	1692,4	1654,1	1073,7	1188,8

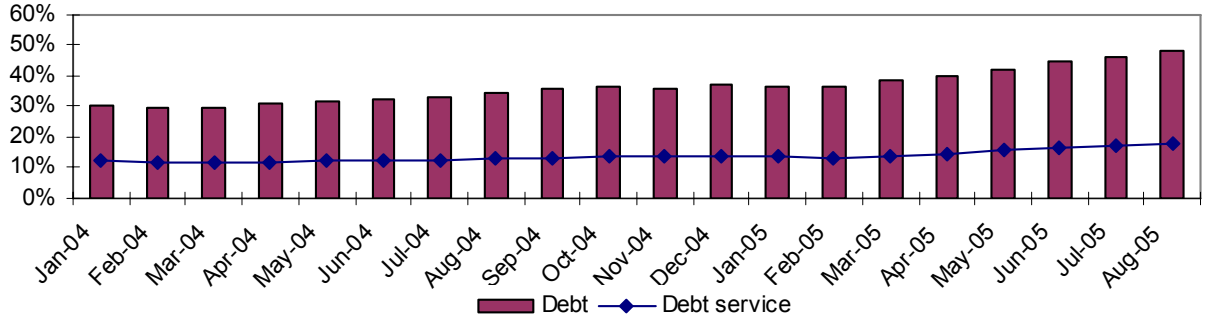
Source: NBR, own calculations.

2.3.3 Evolution of debt service capacity

Household debt (as a percentage of annual wages) was relatively constant until early 2005, with the indebtedness growth being balanced by the increase in income (Graph 2.14). Household debt service burden (as a percentage of annual wages) also maintains a value around 13% and does not cause concern.

Graph 2.14

Household debt and debt service burden as a percentage of annual wages



Source: NBR, own calculations.

However, a relatively constant debt service burden maintained in an environment of decreasing interest rates and upward trend of disposable income, confirms that indebtedness ratio had an expansionary evolution. A hypothetical reverse of the current trends could significantly affect the ability of households to service their debt, which raises concerns from a financial stability point of view. In the next section we detail a quantitative approach in order to identify the reasons that trigger changes in the dynamic profile of indebtedness ratio, and to assess the performance of different liquidity constraints.

3. Quantitative analysis of household indebtedness ratio

We quantify an econometric relationship between household indebtedness ratio and its determinants, with a special focus on the impact of the interest rates on curbing loan growth. Furthermore, using simulations procedures, we analyse the impact and effectiveness of different liquidity constraints on the growth of household debt.

3.1 Econometric modelling of household indebtedness ratio

Empirical estimations using the following monthly time series:

– Total household indebtedness ratio (computed as the share of total loans granted to households in the annual net wages);

– Mortgage indebtedness ratio (computed as the share of household mortgage loans[8] in annual net wages);

– Real annual net wages (CPI deflated);

– Interest rate for household RON denominated loans[9];

– Interest rate for household foreign currency denominated loans[10];

– Overdue payments ratio for household loans;

– Unemployment ratio.

All these variables have been transformed in natural logarithm and have been marked as: *Gr_indat_total, Gr_indat_ipotecar, Sal_reale, Dob_lei, Dob_val, R_restante, R_somaj*. The time series covered the interval January 2000 to February 2005.

Unit root tests (Augmented Dickey Fuller and Phillips-Perron) show all the variables are non-stationary, I(1). Lack of stationarity for the mentioned time series would suggest cointegration. Thus, a long term relation for the household indebtedness ratio and its determinants was obtained using multivariate Johansen procedure for testing the cointegration[11].

The first model estimates the long term relation for total household indebtedness ratio and its determinants (previously detailed). The model comprises only some of the most important

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[8] The source of data for mortgage loan is Public Credit Register.

[9] Up to April 2003 banks' interest rate for non-bank non-governmental loans was used. Starting with 2003 the interest rate used was that specific to current household loans.

[10] Interest rate for foreign currency household loans was obtained by equally weighting interest rate for EUR denominated household loans and USD denominated household loans.

[11] The non-stationarity characteristic of the time series is very important in determining a long run relationship. Modelling long run relations was especially developed by Engle and Granger (1987). Their methodology is based on a single error correction equation. Cointegration is defined as a stationary long term relation between non-stationary variables.

The main disadvantage of a single equation approach is that the models with more than two variables could have more than one cointegration equation, not just one linear combination. Johansen (1990) rules out that disadvantage. Estimating a vector error correction (VEC) reveals information on both short and long term adjustments of variables. The optimum number of lags in a VEC is obtained by testing the optimum number of lags in a Vector Auto-Regressive (VAR) as follows: if the VAR has optimum lags, the VEC is estimated with p – 1 lags. It is necessary to distinguish between stationary long term relations (including cointegration vectors) and non-stationary relations (including common trends). Johansen's procedure suggests testing the reduced rank, therefore identifying the cointegrating vectors of the model. Another disadvantage of this method is the impossibility of quantifying the speed of adjustment to the long run equilibrium.

factors. Including the factors in the cointegration was conditioned by the availability of statistical data and their economic and econometric relevance. The coefficients of the regression could be interpreted as elasticities since all the variables are in their logarithmic form.

Cointegration relation - model 1 (t-statistic in brackets)

Gr_indat_total = 4.126 * Sal_reale – 2.415 * Dob_lei + 4.112 * R_restante – 2.178 * R_somaj

[–4.515] *[1.869]* *[–6.780]* *[2.669]*

–70.078

Johansen procedure indicated only one cointegration vector with statistically significant coefficients. A VEC is estimated to determine the cointegration relation: we use four lags and an exogenous dummy variable that improved the quality of the equation. This dummy variable takes the value of one starting with February 2004, signalling a regulatory structural break as prudential rules regarding consumer credit and mortgage loans were introduced by the NBR[12]. Residual tests indicate lack of autocorrelation and heteroskedasticity, but the normality is not confirmed. However, Lütkepohl (1992) proves that applying Johansen approach does not strictly require the normality hypothesis.

The cointegration relation shows that in a long term equilibrium, a 1% growth of real annual net wages involves an increase of 4.126% of total household indebtedness. The direct relation between the two variables follows the theory. The coefficient of real wages is above one and stands for the highest elasticity in the equation. These facts underline the economic framework of the analyzed interval, characterized by a higher growth of the household loan compared to the real growth of the wages. It also reveals the important impact of this variable on indebtedness.

The decreasing trend of the interest rate for RON denominated loans has the ability of significantly enhancing the indebtedness.

The positive relation between overdue payments ratio and indebtedness ratio does not follow the economic theory. The explanation might come from the minuscule amount of past due loans not yet alarming banks' risk management and from the banks' appetite to widen or consolidate the market share.

Expectations on future income are captured by the unemployment rate. The coefficient confirms the theory: an increase in unemployment implies a decrease of indebtedness, since households expect the income to diminish and thus do not stimulate indebtedness.

The speed of adjustment to the long run equilibrium is -0.076 (t-statistic -5.076), showing that if in the previous month the household indebtedness is higher than the equilibrium level, in the current month will decrease. The deviation of total indebtedness ratio from the long run equilibrium is adjusted in almost 13 months.

The second model reveals the long term determinants of household mortgage indebtedness. The VEC was estimated using two lags, including as exogenous variable the same dummy for the regulation change. Johansen's procedure indicates only one cointegration relation.

Contegration relation - model 2 (t-statistic in brackets)

Gr_indat_ipotecar = 0.986 * Sal_reale – 5.545 * Dob_val – 0.904 * R_restante – 0.228 * R_somaj

[–1.453] *[3.988]* *[3.100]* *[0.633]*

–40.789

[12] Norm no. 15 from 18/12/2003 of limiting credit risk for consumer loan and Norm no. 16 from 18/12/2003 that changes the Methodological Norms no. 3/2000 for applying Law no. 190/1999 regarding mortgage loan. All those norms came into force by February 2004 and tried to reduce the growth of current account deficit, considering that most of household loans are used for buying imported products.

Lack of significance for the unemployment rate indicates an optimistic perception of household income growth. Currently, people who borrow for buying or building a house have medium or high wages and can make the down payment for the mortgage.

Real net wages has some significance for mortgage indebtedness ratio. Firstly, the explanation comes from the expectations of households regarding wage increase according to permanent income theory, sustaining the decrease in the debt service burden. Secondly, higher maturity of mortgage loans generates a smaller share of debt service in income and is also of less importance for long term indebtedness.

Considering that in 2005 almost 90% of mortgage loans were foreign currency denominated, the dominant influence of this interest rate for household loans is justified. The interest rate is the variable that differentiates the choice for the loan currency denomination, and its relation with the indebtedness ratio is negative.

The overdue payments ratio also significantly influences mortgage indebtedness. The negative relation suggests a prudent approach of the banks towards this type of loan covering maturities larger than 15 years.

The speed of adjustment to the equilibrium is -0.083 (t-statistic -2.965). Accommodating mortgage indebtedness ratio to the long run relation with its determinants takes almost twelve months, quicker compared to total indebtedness ratio.

Overall, the ability of interest rates to influence the credit growth is noticeable especially for the foreign ones. The explanation might be relative small share of the nominal domestic interest rates in the total effective interest rates. In this environment, it is needed a consistent move in the nominal domestic interest rates to charge an effect towards the dynamic of household indebtedness.

3.2. The impact of liquidity constraints on household indebtedness

As discussed the first section, Modigliani's and Friedman's theories of permanent income and life cycle are very important in identifying the future trend of household indebtedness. However, in Box 1 we underlined the fact that the emerging reality in Romania suggests relaxing some of the assumptions of the mentioned theories, such as considering the liquidity constraints on household indebtedness. That type of restrictions coming from market regulation or banks' policy will diminish the capacity of households to borrow the optimum amount from the point of view of intertemporal budgetary constraints specific to life cycle theory.

The liquidity constraints play a dual role from a financial stability point of view: (i) allowing for a maximum potential indebtedness of households and (ii) serving as an instrument of the authorities used either for stimulating or for reducing household loans.

Practically, the liquidity constraints are of two types:

(i) a maximum limit for the weight of debt service (principal and interest) in the current household disposable income - subsequently signalled by **z**.

(ii) a maximum limit for the ratio of loan to the value of the collateral or the guarantee (**LTV**), representing, in fact, a minimum limit for the down payment.

Next we follow Debell (2004) that computes the maximum amount of mortgage loan that could be borrowed by households considering the liquidity constraints. We extend the idea as to obtain both the maximum amount of consumer and mortgage loan and the currency breakdown of household indebtedness ratio. We considered the following variables:

(i) V_t - household disposable income at the moment t, approximated by net annual wages;

(ii) D_t - household bank deposits standing for the savings needed for the down-payment in order to obtain the loan;

(iii) z_i, z_c - maximum weight of debt service in disposable income for the mortgage, respectively consumer loan;

(iv) LTV_i, LTV_c- loan to value: the maximum weight of mortgage, consumer loan respectively, in the value of collateral or guarantee; equivalent to (1 - down payment percentage);

(v) i_lei_t, i_val_t - nominal interest rate for RON denominated household loans, foreign currency denominated loans respectively, at the moment t;

(vi) α_i, α_c - ratio of mortgage loans, consumer loans respectively, to total household loans;

(vii) β_{lei}, β_{val} - ratio of RON denominated loans, foreign currency loans respectively, to total household mortgage loans;

(viii) γ_{lei}, γ_{val} - ratio of RON denominated loans, foreign currency loans respectively, to total household consumer loans.

$$\text{Maximum potential loan} = \alpha_i * \left[\beta_{lei} * \min\left\{ D_t * \frac{LTV_i}{1-LTV_i}; z_i * \frac{V_t}{i\_lei_t} \right\} + \beta_{val} * \min\left\{ D_t * \frac{LTV_i}{1-LTV_i}; z_i * \frac{V_t}{i\_val_t} \right\} \right] + \alpha_c * \left[\gamma_{lei} * \min\left\{ D_t * \frac{LTV_c}{1-LTV_c}; z_c * \frac{V_t * \left[1-(1+i\_lei_t)^{-2.5}\right]}{i\_lei_t} \right\} + \gamma_{val} * \min\left\{ D_t * \frac{LTV_c}{1-LTV_c}; z_c * \frac{V_t * \left[1-(1+i\_val_t)^{-2.5}\right]}{i\_val_t} \right\} \right]$$

The first term of each minimum function indicates the possible credit amount that could be obtained considering the liquidity constraint of down payment. The second term indicates the maximum loan amount given the present value of future cash flows at moment representing the debt service. Mortgage loans have longer maturities which allows for the use of the limit in the present value formula of debt service. Consumer credit has not the same property: the proxy for the maturity is 2.5 years.

These liquidity constraints show that household indebtedness could change along the institutional structure of financial markets. The median value for LTV is 80% in developed countries, although in some countries there are ratios of 100% or even more (Netherlands, USA etc).

In Romania, the rapid growth of household loans, that started in 2003, was attempted to be slowed down by imposing prudential regulations requesting banks to apply (i) maximum limits for the ratio of debt service to net income (computed as a difference between total income and declared expenses) and (ii) minimum limits for down payment (respectively maximum limits for LTV). These liquidity constraints have been differentiated by the type of loan in the following way:

(i) For mortgage loan: z_i = 75% and LTV_i = 35%.

(ii) For consumer loan: z_c = 30% and LTV_c = 100% if the loan is not for acquiring goods, but is guaranteed by third parties and/or collateral; in case of loans for buying goods an LTV_c of 75% is imposed. Generally, for the consumer loan the banking system preferred not to request a down payment over collateral or guarantees.

Applying the model for the Romanian case at the moment t (considered to be March 2005) we obtain the maximum potential credit that could be granted to households. Also, we were

interested in simulating changes in variables that imply liquidity constraints (z, LTV and interest rates for RON and foreign currency loans) in order to determine the growth of household loans. The values of the variables are presented in Table 3.1.

Table 3.1

The variables of the model for March 2005

Household loans (mill. RON)		13 053.12	
α_i - % of mortgage loan		α_c- % of consumer loan	
29%		71%	
β_{lei}- % RON denominated mortgage loans	β_{lei} - % of foreign currency mortgage loans	γ_{lei} - % of RON denominated consumer loans	γ_{val} - % of foreign currency consumer loans
9%	91%	65%	35%
D_t - Household bank deposits (mill. RON)		26 046.67	
V_t - Annual net wages (mill. RON)		38 550.86	
i_lei_t - nominal interest rate for RON denominated household loans		24.6%	
i_val_t - nominal interest rate for EUR denominated household loans		10.2%	
z_i		35%	
z_c		30%	
LTV_i		75%	
LTV_c		100%	

Source: NBR.

In March 2005 the household indebtedness, computed as the ratio of household loans granted by banks to annual net wages, reached 34%. Considering the liquidity constraints, the results reveal a maximum potential loans of 37 235.47 millions RON. Thus, the households borrowed only 35% of the potential loans. If all the potentially available credit were fully utilised, the potential indebtedness ratio could have scaled up to 97%. However, there are some reasons for the low coverage of potential loans:

(i) the banks' lending policy is sometimes more restrictive than imposed by the prudential regulation;

(ii) households do not borrow the maximum loans that could be granted or prefer not to have debt;

(iii) the percentage of households affected by liquidity constraints (λ) could be significant, but difficult to assess when we have no information on income breakdown of indebted households. In fact, some studies[13] reveal that in countries

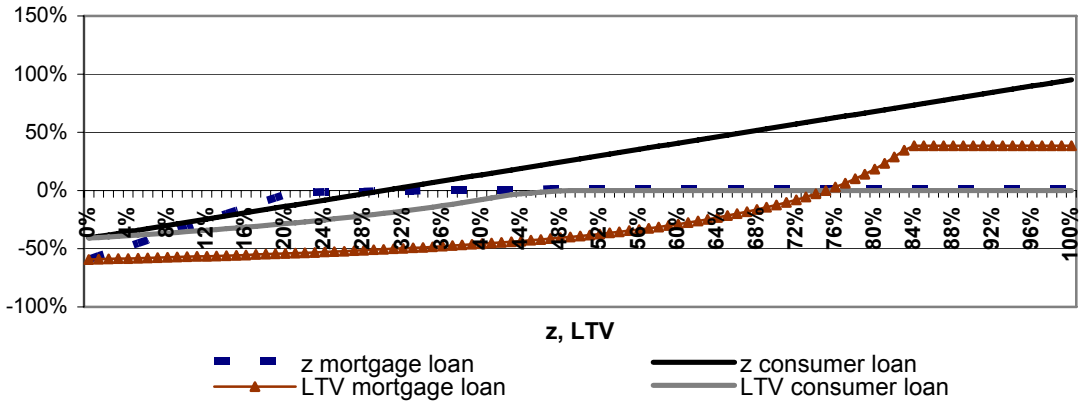
[13] The liquidity constraints have been usually considered as not confirming the hypotheses of Modigliani's and Friedman's theories regarding savings life cycle. Hall (1978) changed the standard model to include liquidity constraints, thus considering the percentage of households that cannot go in debt (λ) on the basis of income and future wealth, consuming only the current income. Hall and Mishkin (1982) estimated a λ of 20% to 30% for American households. For UK, Bayoumi (1993) estimated a λ of 60% before financial deregulation of the

characterised by a high spread between loan and deposit interest rates, a reduced loan to value (LTV) and a small proportion of young house owners (as in the case of Romania), the value of λ could be very high.

In the second stage, we use the model to determine the change of maximum potential loans compared to the actual potential value considering the liquidity constraints. The results are obtained by simulating different values for z_i, z_c, LTV_i, LTV_c. Each factor take values from 0% to 100%, ceteris paribus.

Graph 3.1

Chage of simulated potential loans compared to actual potential loans as a function of liquidity constraints



The results of the simulation for March 2005 indicate some interesting conclusions (ceteris paribus):

(i) The most important causal factor for reducing potential household loans is due to an increased percentage of down payment for the mortgage loan, equivalent to reduction of LTV_i;

(ii) A LTV_i higher or equal to 84% results in a flatter curve at around 38.37% of the growth of potential loans compared to the actual potential loans and also implicitly flattens the potential indebtedness ratio;

(iii) At LTV_c equal to or higher than 49%, there is no further impact on maximum potential household loans;

(iv) A one percentage point increase in the ratio of debt service for consumer credit to annual net wages (z_c) involves a 1.4 pp increase in simulated potential loans compared to actual potential loans;

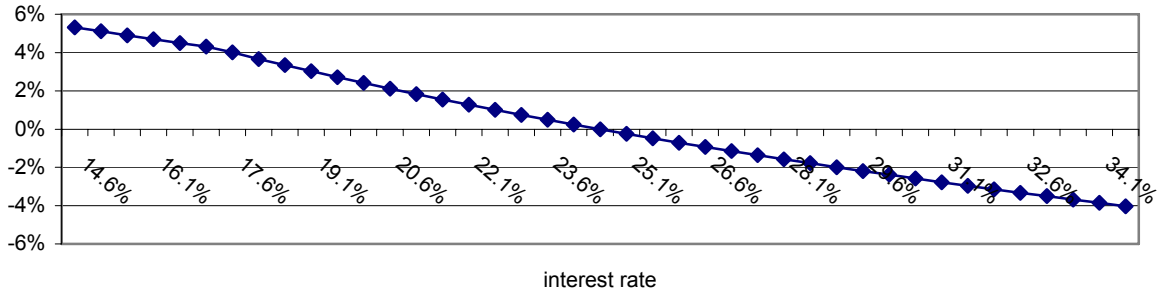
(v) A level of z_i higher or equal to 50% produces a constant growth of 1.63% for simulated potential loans compared to actual potential loans. In the case of strong restrictiveness of mortgage loans, using a z_i smaller than 20%, 1 pp increase of z_i leads to a decrease by 2.8 pp of simulated potential loans compared to actual potential loans.

80's and a λ of 30% in 1987. Jappelli and Pagano (1989) proved the existence of liquidity constraints by linking λ to specific institutional features of the credit market.

The inverse relation between interest rates and granted loans was validated by simulating changes in the interest rates for RON and foreign currency loans (Graph 3.2 and 3.3). A higher sensitivity is observed in the case of interest rate for RON denominated loans: a 1 pp decrease involves a 0.4 pp growth of simulated potential loans compared to the actual potential loans. In the case of the foreign currency loan interest rate, a 1 pp decrease generates a 0.3 pp growth of simulated potential loans compared to actual potential loans.

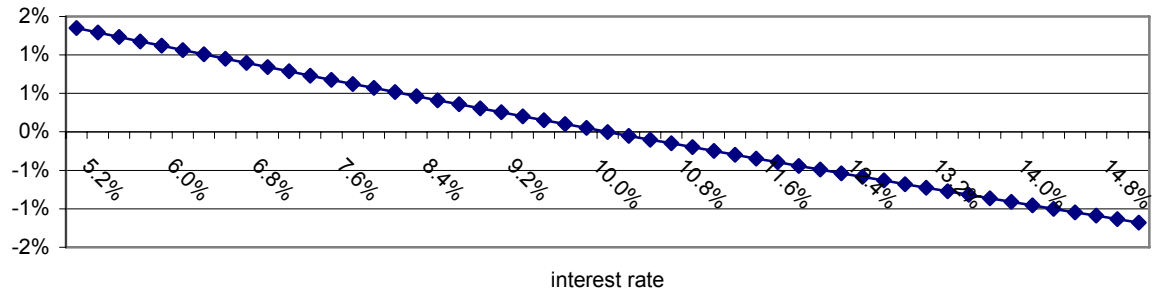
Graph 3.2

Change of simulated potential loans compared to actual potential loans as a function of EUR loan interest rate



Graph 3.3

Change of simulated potential loans compared to actual potential loans as a function of RON loan interest rate



In conclusion, the simulations revealed that imposing liquidity constraints on household borrowing could decrease up to a maximum 60% of potential loans. Keeping in mind that the effective level of current loans is lower than the potential level, imposing liquidity constraints would have no significant impact on the growth of the effective household debt. Thus, in the eventuality of a need for a slowing down of the strong dynamics of household loans, different types of measures could be considered (for example, limits on loans, however with dramatic results). Another conclusion of the simulations shows that reducing household loans could be achieved more effectively by imposing constraints on mortgage loans. The smallest reduction of potential loans is obtained by increasing interest rates (for RON loans and also for EUR loans).

4. Conclusions and possible policy measures

Although the risks stemming from the household sector have increased during the last years, we find no systemic impact on financial stability in the short run. Household assets' returns lead to higher volatility, due to switching towards capital instruments at the expense of currency and bank deposit holdings. On the liability side, an increasing indebtedness draws attention to: (i) unhedged borrowers and (ii) possible scenarios of soaring interest and unemployment rates.

The trends in household consumption and saving are of particular interest for financial stability. Improved macroeconomic framework, easier access to finance and allocating a higher weight of the household budget to satisfy the craving for a higher standard of living are some of the reasons generating a higher growth in consumption, especially for superior goods. The process of European integration encourages expectations of net income growth, being another argument underpinning the hypothesis of turning the potential into effective demand. Nevertheless, when the domestic supply is too inelastic to cope with the change in the structure and volume of the demand, imports might become such an important substitute as to impair the sustainability of the current account deficit.

In the long run, the expansion of household indebtedness might have potentially beneficial effects on financial stability, by enhancing financial discipline. As the ratio of indebted households increases and the coercive mechanism of credit bureaus intensifies, households will be more preoccupied in identifying ways for maintaining and increasing disposable income (labour productivity growth, improving professional skills, finding an additional job etc.).

The percentage of household loans to GDP reached almost 5% at the end of 2004 (starting from a humble 0.63% in 1995), but is still significantly lagging behind the EU values. The determinants of the supply and demand for the household loans both act in the same direction, towards loan expansion. The ratio of defaulted loans to total loans remains at a constant low level. The concentration of household loans has decreased both geographically and institutionally.

The level and the dynamics of the savings process do not attract particular attention at a macroeconomic level due to the level of structural liquidity in the system. However, at a microeconomic level, savings should be more attentively monitored because: (i) the delays in the reform of the pension system, (ii) worsening demographic situation and (iii) a growing probability that a higher percentage from household budget will be allocated in the future to educational and medical expenses.

The net household assets expanded primarily due to increases in real estate prices.

Simulating different scenarios, using liquidity constraints and its impact on credit growth (by a maximum limit for LTV and a maximum limit for the ratio of debt service to disposable income), indicated some impact on potential loans, but the value of the new lower level would be twice the current effective loans. The result also highlights the relatively limited ability of liquidity constraints to control a boom in the household loans.

From the analysis done is paper we can derive some policy measures that in our opinion might be useful in preserving the financial stability in the long run:

1. We find that the ratio of foreign currency loans granted to households significantly expanded. It is possible to further maintain this trend, as long as the domestic currency appreciates, and the foreign interest rates stay lower than for RON. A long lasting adverse shock on domestic currency might affect debt service burden and impair the ability of servicing the debt, with negative consequences on creditors (mostly credit institutions). When the capital requirements are not sufficient to cover an unexpected loss (ie if the level of regulatory capital is smaller than the economic capital), the credit institutions might find it hard to cope with the situation. We suggest higher risk weights for

unhedged borrowers. This prudent approach is in line with the recommendations of the second Pillar of Basel II. The analysis of an unhedged borrower could be extended by considering not only income, but also other holdings of financial assets (transforming stock variables into flow variables and eventually weighting them with a risk and liquidity coefficient).

2. Lately, many non-bank financial institutions (e.g. leasing, credit intermediation companies) have started granting consumer loans. These entities (i) are not forced to comply with banking activity prudential requirements, thus leading to capital arbitrage possibilities, and (ii) are not forced to report to a credit bureau, which results in an asymmetric information situation adversely affecting the banks. By expanding consumer loans, non-bank financial institutions can increase the growth of household indebtedness. Lack of statistical data regarding these loans could impinge on the financial stability analysis resulting in undervaluation of household liabilities. These drawbacks could be avoided by promoting a regulation stipulating that all bank and non-bank entities should report certain data about their debtors to a credit bureau. Extending the scope of prudential measures on household indebtedness ratio to non-bank companies could also be considered.
3. We expect that as the Romanian financial market develops and the financial products become more complex, households will face higher financial risks and their management process will be more difficult to run. A financial system is said to be stable when it has the ability to efficiently allocate the resources, and the risk is properly assessed and managed by the players. To this end, the authorities' involvement should be more active in improving household financial education. The public sector should also cooperate with the private sector in promoting financial education. Simply feeding households with exhaustive information of different financial products and services does not replace the understanding and financial education. The role of the private sector in that process could materialize in financial support for educational programs and effective education of the customers.
4. Considering the significant discrepancies in the structure of the Romanian households (urban - rural, rich - poor, young - old etc), there is a particular interest for surveys focusing on these structural characteristics. It is possible that indebted households face higher risks than those revealed in our research.

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Session 5A

Distributional aspects of household finances

Chair: Janez Kosak
Bank of Slovenia

Papers: Survey data on Austrian households' financial wealth: main findings and challenges
Christian Beer, Peter Mooslechner, Martin Schürz and Karin Wagner, Austrian National Bank

Capital gains and wealth distribution in Italy
Luigi Cannari, Giovanni D'Alessio and Romina Gambacorta, Bank of Italy

Greek household indebtedness and financial stress: results from household survey data
George T Simigiannis and Panagiota Tzamourani, Bank of Greece

The distribution of assets, debt and income among Chilean households
Paulo Cox, Eric Parrado and Jaimie Ruiz-Tagle V, Central Bank of Chile

Survey data on Austrian households' financial wealth: main findings and challenges

Christian Beer, Peter Mooslechner,
Martin Schürz and Karin Wagner[1]

1. Introduction

Austrian financial accounts data show that the Austrian household sector's financial wealth increased by nearly 70% in nominal terms from the end of 1995 to the end of 2005. During this period, while the share of securities in financial assets expanded only marginally, investment shifted from bonds to stocks and mutual fund shares (Andreasch, 2006). With households'[2] financial assets on the rise and their investment in capital markets growing, interest rate and asset price developments are increasingly influencing households' investment behavior.

However, aggregate data reflect only the development of the household sector as a whole and do not provide any information about developments within this sector, which may well be quite heterogeneous. Consequently, micro data on assets, investment and debt structure at the household level provide indispensable information about numerous issues relevant to economic policy.

A growing number of central banks recognize the importance of household microdata and thus conduct surveys to collect such data. Among others, the Federal Reserve Board (Bucks et al., 2006), the Banca d'Italia (Brandolini et al., 2004), the Banco de España (Bover, 2004) and De Nederlandsche Bank conduct such surveys. These surveys provide information important for research about some key issues: the consumption and savings behavior of households in relation to the level and composition of household income, wealth effects on consumption and on the monetary transmission mechanism, the presence of credit rationing, wealth and income distribution, the influence of income risk on households' consumption decisions, the impact of tax incentives on households' savings behavior, general financial knowledge, financial investment decisions, the consequences of different pension systems and financial stability-related aspects such as the exposure of household investments to capital market risk and finally household debt sustainability.

As it is important to link the variables at the center of analysis (eg consumption, investment or financial wealth) with the socioeconomic characteristics of households to analyze all of these issues, an analysis is possible only with the help of detailed microdata.

This paper is organized as follows: The design of the survey on households' financial wealth conducted by the OeNB in 2004 and some basic methodological problems of household wealth surveys are discussed in section 2. Section 3 presents the main results of the OeNB's survey as well as data on household investment and saving behavior provided by the survey. Section 4 gives the main results of some more analytical methods (cluster analysis, logit estimates) to characterize the households' financial situation. The next steps forward are described in section 5. Section 6 summarizes the main findings. The paper concludes with an annex of tables that provides data on selected issues.

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[1] Oesterreichische Nationalbank. The authors would like to thank Thomas Scheiber for research assistance.

[2] The term "households" in this study refers to private households.

2. The Survey design - potential problems and how to deal with non-response

This study presents the results of a (pilot) survey on Austrian households' financial wealth the Oesterreichische Nationalbank (OeNB) conducted in the summer and fall of 2004 and discusses methodical questions. The purpose of the survey was to capture microdata on households' financial wealth, investment and debt. 87 questions covering the sociodemographic characteristics of the households surveyed, assets, asset sources, information sources about financial market topics and approaches to financial market issues. The data were collected by the market research institute FESSEL-GfK, which applied multistage stratified clustered address random sampling to achieve representative results. The survey was carried out by means of face-to-face and written interviews. The interview partner was the household head or the household member with the most accurate knowledge about the respective household's finances. A total of 2,556 analyzable data sets were compiled (in Vienna, 1,026 of an original 1,869 addresses and in the other provinces 1,530 of 2,408 addresses provided results). Generally, households were stratified by the province of residence, except for Vienna, where households were stratified by the 23 political districts. Within the districts, the prospective respondents were selected at random. To make the sample more representative post-stratification weight were computed. The age, occupation and education of the household head and the size of the household, the presence of children up to the age of 14 and the district were factored into the weighting.

Methodical issues

Conducting and designing a survey on household wealth involves many conceptual methodical challenges. This topic is for example discussed in Schürz (2006). In this section some of these issues are discussed with a focus on the Austrian survey.

(a) Sampling errors

Sampling errors arise from estimating a population characteristic by looking at only one portion of the population. Regarding wealth surveys the high variability of wealth in the population and its concentration among a few households poses special challenges. To give an example assume that one is interested in the number of billionaires in a country. With a sample size of e.g. 5,000 households, in most cases there will be no billionaire in the sample. But if by chance a billionaire happens to be in the sample the conclusion that one in 5,000 households has a net wealth of EUR 1 billion is wrong.

To correct for this and to obtain a good depiction of wealth holdings and the use of financial instruments, wealthy households have to be treated differently. For instance, some household surveys oversample wealthy households (i.e. the probability of inclusion in the sample is higher for wealthy households). Oversampling can be based on tax records[3] or on other information (e.g. information concerning residential areas of the rich). The OeNB survey used for this study did not oversample wealthy households. A particular problem in Austria is that the wealth tax was abolished in 1994 and capital income is mostly taxed at the origin. Therefore it is not possible to apply techniques as in the Spanish EFF or in the US SCF.

[3] Eg Barceló, C. and O. Bover (2006) or Kennickell, A. (2005).

(b) Non-sampling errors

Non-sampling errors can stem inter alia from non-response and wrong responses, as households are not willing to participate in the survey at all (unit non-response) or they refuse or are not able to answer certain questions (item non-response). Evidence shows, that rich households are to a lower extent ready to answer financial wealth questions (D'Alessio 2002). Hence, wealth surveys face the problem that non-response is not at random but depends on the wealth of the household, ie on the key variable the survey is interested in.

The case of Viennese household data illustrates how these problems were dealt with in the OeNB survey.

In the survey a total of 1,039 interviews were taken. Missing items were asked by telephone. At this stage 13 cases were removed from the data set, as some respondents refused to answer questions on income and wealth items. Therefore, the data set contains 1,026 interviews. In 492 interviews (48%) at least one question was not answered. Most of these unanswered questions concerned saving forms, saved sums and life insurance contracts. These questions accounted for the largest part of incomplete interviews. For households with older persons and households with more than one person the value of the saved sum of all household members was often not directly available. In all these cases the missing information could be obtained by telephone. However, it is unclear whether the responses given after the respective questions were asked for a second time can be compared with the answers from households that answered right away.

3. Households' financial assets - overview of the main results of the 2004 survey

3.1 Concept of financial assets

The discussion of wealth naturally requires clarification as to what is to be understood under this term (see e.g. Schürz, 2006). In analysing survey data as well as data from financial accounts analysts often apply approaches that are led by the available data. Radner and Vaughan (1987) described this approach as "Net worth consists of all assets less all debts covered by the survey". In research the wealth concept used should depend on the particular question to be analysed. An overview of different wealth definitions is given by Stein (2004).

At this point is seems useful to define the term "wealth" as applied in this study. Gross financial assets were calculated as follows:

gross financial assets = current account holdings[4]

+ savings deposits including deposits made under building loan contracts

+ value of bonds

+ value of stocks quoted on the stock exchange

+ value of mutual fund shares (equity funds, bond funds, mixed funds, real estate funds, hedge funds, money market funds)

+ value of holdings in enterprises

+ accumulated payment of life insurance premiums.

[4] The survey did not cover cash holdings. After all, whether to include cash in assets is a matter of debate (transaction balances, loss of value etc.).

In this study, net financial assets are defined as gross financial assets excluding consumer loans. Net financial assets include neither home loans nor their counterpart, real estate holdings. Taking home loans into account might have distorted the estimate of household assets, whereas there is less danger of distortion in the case of consumer loans, as the value of the consumer goods purchased with such loans generally declines quickly.

In interpreting the data in this study, it should be noted that they come from a single cross section survey. Repeated cross-section surveys or, ideally, a panel would be desirable as a basis for research in most of the areas listed above.

3.2 Net income is the prime determinant of the level of financial assets

The survey shows Austrian households' net assets to average EUR 51,790. The median amounts only to EUR 21,855. This underlines that net financial assets are highly unevenly distributed.

Considered by socioeconomic criteria[5], the level of financial assets is shown to depend markedly on household net income. Households with a monthly net income of less than EUR 750, for example, have net financial assets of EUR 6,621 (median: EUR 3,583); the net financial assets of households with incomes in excess of EUR 3,000 average EUR 117,779 (median: EUR 53,039).

Broken down by the household head's age, the youngest group in the survey (18 to 29 years) has the lowest average net financial assets, namely EUR 15,816 (median: EUR 5,903). Net household financial wealth rises from category to category, peaking at an average of EUR 79,010 in the group of household heads aged 60 though 69.[6] The share of households with negative net financial assets is higher than average among 30- to 39-year-old household heads, as especially many households in this category have taken out consumer loans. A presentation of financial assets across age groups produces a hump-shaped curve, which corresponds to the theoretical expectations about individuals' asset developments according to the life cycle model.[7]

3.3 Debt focuses on housing loans

Principally, only consumer loans are included in the calculation of net financial assets in this study (section 3.1). However, data on home loans and outstanding housing debt were also collected in the survey to complete the picture of household debt. These data and data on total household debt are examined below.

Overall, more than 40% of all Austrian households have taken out loans, 30% of which are for consumption purposes, nearly 60% for housing purposes and over 10% for both purposes. As in the case of financial assets, there is a positive correlation between borrowing and household net income. The relative share of consumer loans, however, is higher among low-income households. If one looks at the different age groups, households headed by 30-to 39-year-olds are most likely to borrow, with both home and consumer loans important in this group. The reason for this age group's high debt is its high demand for long-term consumer goods and investment in housing.

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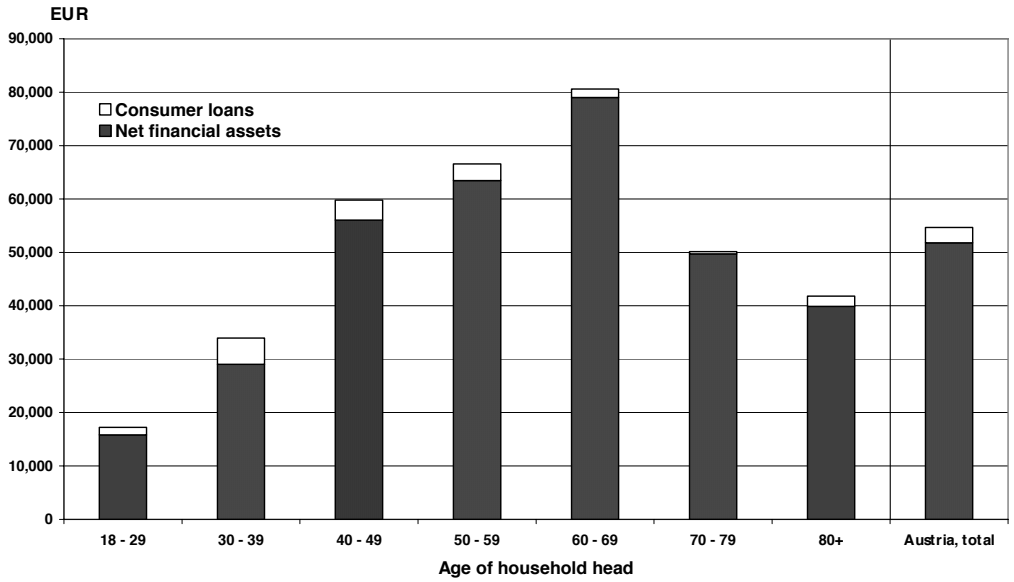
5 A more detailed analysis can be found in Beer et al. (2006).

6 Median household financial assets rise up to the group of 50- to 59-year-olds.

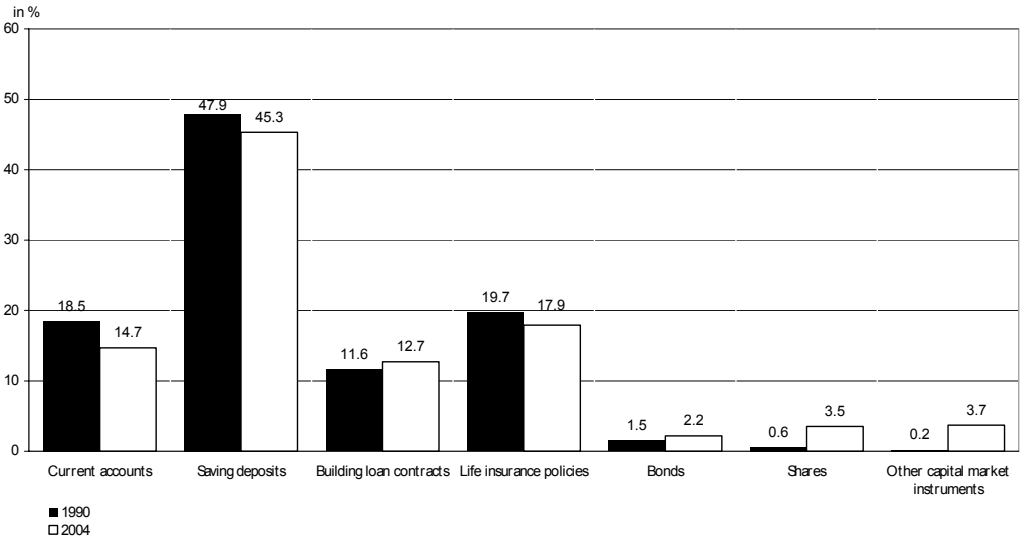
7 In principle cross-sectional data from a (static) age distribution at a specific survey date must not be interpreted as dynamic across the life cycle.

Comparison of net financial assets and consumer loans by age of household head



Source: Authors' calculations based on a survey conducted by FESSEL-GfK.

Change in composition of gross financial assets over time (Vienna)



Source: Mooslechner (1997), Authors' calculations based on a survey conducted by FESSEL-GfK.

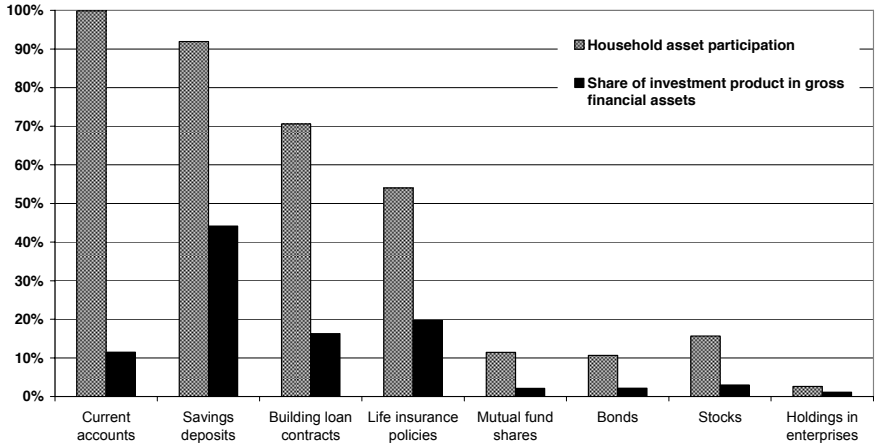
Note: As definitions of life insurance products differ, their comparability is limited.

The average Austrian household has borrowed some EUR 20,000, with home loans accounting for approximately 86% of the loan volume. Households which take out home loans incur an average debt of roughly EUR 40,800 (median: EUR 18,000) through these loans. Factoring in home loans, Austrian households' average financial assets come to just above EUR 35,000 (median: roughly EUR 14,000).

3.4 Savings deposits are the main investment

The average share of savings deposits[8] in gross financial assets is approximately 44%, building loan contracts account for 16%, life insurances for 20%,[9] stocks for 3%, mutual fund shares for 2% and bonds for 2% of gross financial assets. Holdings on current accounts represent 11% of financial assets, with the share declining sharply as income rises. Households with incomes of below EUR 750 hold nearly a third of their financial wealth on average on their personal accounts; the share drops to 5% for households with incomes of over EUR 3,000. Capital market instruments[10] and holdings in enterprises[11] show opposite developments across household categories. The average share of stocks in gross financial assets rises from 0.3% among households with incomes below EUR 750 and rises to 5.8% among households with incomes above EUR 3,000.

Household portfolios and the importance of selected financial assets



Source: Authors' calculations based on a survey conducted by FESSEL-GfK.

Income is obviously an important determinant factor in portfolio decisions. As income rises, the share of assets held on current accounts and in savings deposits, including building loan contracts, declines, whereas the weight of capital market instruments rises. The share of holdings in enterprises in individual household categories also rises in parallel to income. Only 1% of all households with net incomes of less than EUR 750 own stocks, but 33% households with incomes of more than 3,000 own stocks; the pattern is similar for bonds and mutual fund shares.

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8 The average share of investment product *j* in gross financial assets is calculated as $Share_j = \frac{\sum_{i=1}^{N} \frac{X_{ij}}{BV_i}}{N}$, with $i = 1, \ldots, N$, representing a household in the respective investment category, X_{ij} representing the amount invested by household *i* in investment product *j* and BV_i representing the gross financial assets of household *i*. This calculation method weights all households equally and thus reflects average investment behavior better than other methods.

9 For technical reasons, the value of the stock of life insurance assets was calculated on the basis of premium payments in this survey, so that the actual value of life insurance assets tends to be underestimated.

10 Stocks, bonds and mutual fund shares.

11 The survey questions called for a breakdown by individual or family ownership and stakes in limited liability companies.

3% of households have holdings in enterprises; the average net financial assets of this group come to over EUR 330,000 (median: roughly EUR 115,000), which is far higher than the average net financial assets of the total population.

A similar survey was conducted in Vienna in 1990 (Mooslechner, 1997). While the differences between some definitions and delimitations limits comparisons between the two surveys, some changes in Viennese households' investment behavior can nevertheless be discerned: The average share of holdings on current accounts and savings deposits in Viennese households' gross financial assets has declined markedly, whereas the weight of capital market instruments in their portfolios has risen noticeably. Above all, their holdings of stocks have expanded, but higher investment in mutual fund shares is also likely to have been at the heart of the increase in the category other capital market instruments.[12]

3.5 Saving for retirement: life insurance contracts and savings deposits top other investment

The pension reforms of recent years were aimed at boosting the importance of making private pension provisions in households' financial planning (individual saving for retirement). Respondents were asked to assess the importance of making private provisions for retirement, to state what measures they had taken and to specify the provisions they had made. Unlike the other questions in the survey, these questions on saving for retirement were addressed directly to the respondent and hence do not apply to the entire household. The answers indicated that more than 80% of the persons questioned consider individual saving for retirement (in addition to the statutory scheme) very important or rather important. The importance of individual saving for retirement declines as the age of the household head increases. By profession, owners of businesses and independent professionals see individual saving for retirement as most important.

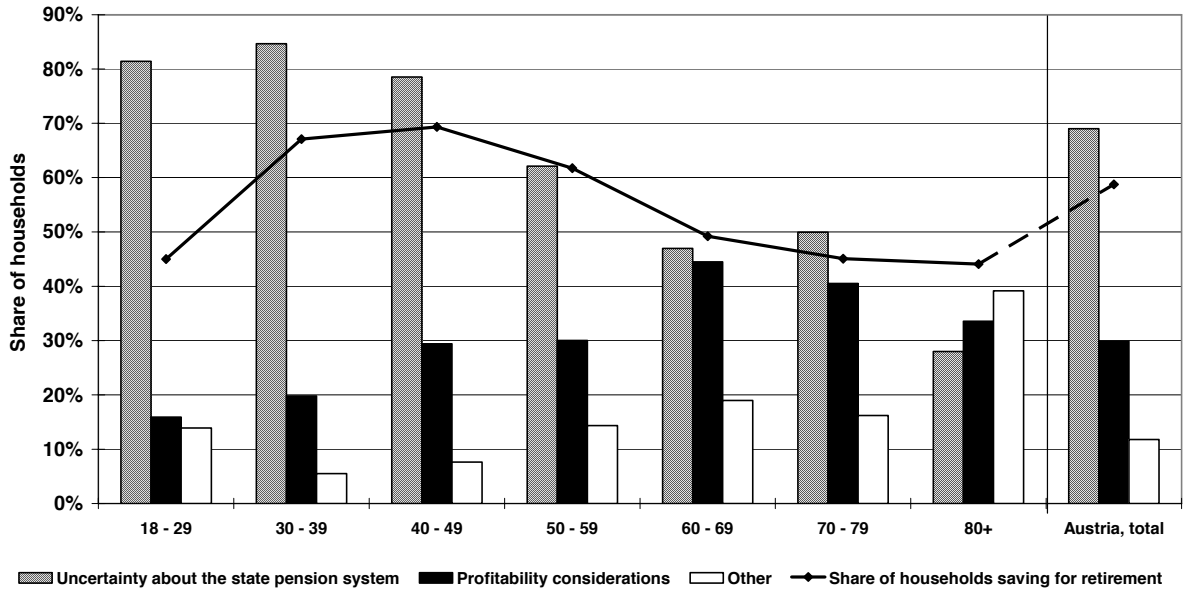
Nearly 60% of the respondents report having saved for their own retirement. The survey covered all forms of investment the respondents considered saving for retirement, ie not just investment specially designed for this purpose (eg subsidized personal pension schemes), but also assets such as passbook savings accounts.

Considered by age, the frequency of individual saving for retirement was highest in the group of 30- to 50-year-olds. This is the age cohort that is most heavily affected by the pension reforms and in which most people work. Broken down by occupational status, saving for retirement is most prevalent among owners of businesses. 71% of all civil servants, whose pensions are better secured than those of other professional groups, save for their own retirement. The higher a group's income is, the more likely it is that its members will provide for old age. Higher income enlarges the scope for saving for old age, but also provides more economic incentive to do so. High incomes prior to retirement are often preceded by a steep life-cycle income curve. Thus, a longer contribution period used to calculate pensions has a negative impact on the size of the expected pension. Moreover, households can expect the income replacement ratio for incomes above the earnings cap for pensions to be low. The incidence of individual saving for retirement also rises strongly in parallel with the size of household financial wealth.

[12] 1990: dividend right certificates, mutual fund shares, participation certificates, real estate bonds; 2004: mutual fund shares, holdings in enterprises.

Saving for retirement and related motives by age of household head

Multiple responses



Source: Authors' calculations based on a survey conducted by FESSEL-GfK.

Logit estimates (see also section 4.2) show that income and age are highly significant for the investment in individual retirement savings, as are the occupational status, the housing status and education. The higher their education level is, the more likely household heads are to save for retirement themselves.

3.6 Households' saving behavior: roughly half of all households save regularly

Households report that the main source of savings is disposable income not required for consumption (relinquishment of consumption). As income and financial assets rise, the role of inheritances increases. 20% of households with very high net financial assets name inheritances as a major source of their savings. By comparison, about 9% of the total population lists inheritances as a source of savings.

More than half of the respondents report that they save regularly or make deposits under a savings plan; 44% save at irregular intervals or put aside whatever income is left at the end of the month. 5% of households are unable to save. The higher households' income and financial wealth are, the more they save on a regular basis. 24% of households with net incomes of below EUR 750 state that they are unable to save; 12% have no savings.

4. Some further approaches to draw conclusions about the financial position of households

4.1 Cluster analysis: 13% of all households feature a strong tendency to invest in capital markets

A cluster analysis[13] was performed directly on the basis of households' investment strategies rather than on the basis of their socioeconomic characteristics. Households are grouped into clusters that can be considered the statistically most homogeneous groups in terms of investment strategies. The aim is to draw conclusions about demographic characteristics on the basis of the financial products[14] these households have chosen to invest in and in this manner to identify possible determinants of the investment decision.

Table 1

Results of the cluster analysis

	Cluster 1	Subcluster 1a Traditional investors	Subcluster 1b Traditional investors who tend to invest in more sophisticated products	Cluster 2 Capital market-oriented households	Cluster 3 Households with a minimum of investment products (passbook savings account)	Cluster 4 Capital market orientation with a lower volume of investment
	%					
Distribution of households	52.7	39.8	12.8	12.6	22.7	12.0
	EUR					
Gross financial assets, mean	43,845	35,285	70,385	170,317	20,787	44,277
Gross financial assets, median	25,486	21,775	35,785	94,614	7,634	24,713
Net financial assets, mean	41,186	32,492	68,141	166,661	18,618	39,940
Net financial assets, median	23,011	19,788	35,701	92,214	6,590	23,070
Consumer and housing loans, mean	19,924	19,050	22,634	28,782	10,983	25,058
Distribution of capital market instruments	% of households					
Mutual fund shares	5.2	4.6	6.9	49.9	2.9	14.3
Bonds	5.4	4.4	8.4	51.2	2.9	5.5
Stocks	3.7	2.2	8.6	84.6	4.4	16.6
Equity investment	2.2	2.6	1.0	6.7	1.1	2.8
Individual saving for retirement						
Yes	61.1	58.5	69.2	84.4	37.3	62.1

Source: Authors' calculations based on a FESSEL-GfK survey.

The cluster analysis identifies four clusters; the first cluster may additionally be subdivided into two subclusters (clusters 1a and 1b). Cluster 1 covers "traditional" investors. The financial wealth of households in cluster 1a is limited to deposits, building loan contracts and life insurances. The prevalence of building loan contracts and the average share of building loan contracts in gross financial assets are highest in this cluster. Households in cluster 1b invest above all in savings products with a higher return (eg a capital savings account, premium-aided savings). The households subsumed in cluster 2 are capital market oriented. The average share of capital market instruments in these households' financial assets is around 30%. The households in cluster 3 may be defined as those with a minimum of investment products, as all investment products are only represented to a small degree. The

[13] The methods used for the cluster analysis are described in the appendix.

[14] See the appendix for the variables/financial products used.

households in cluster 4 have a low level of assets, but endeavor to diversify their investment. Therefore, in relative terms, their investment in capital market instruments is high.[15]

4.2 Logit estimates: income determines investment decisions

The socioeconomic characteristics of households play a key role in their choice of investment products. The question of which of these characteristics has the biggest impact on households' investment strategy can be analyzed using logit models that estimate the probability of holding a certain investment product as a function of specific household characteristics.

Table 2

Influence of socioeconomic characteristics on investment decisions

	Building loan contract	Stocks	Mutual fund shares	Bonds	Life insurance policies	Capital savings account
Employment of the household head						
Occupational status (worker, employee, entrepreneur)						
Gender of household head						
Marital status of household head						
Housing status (owner-occupied versus rental)	***	**	**	*	*	
Education of household head						
Employment status (private sector/public sector/self-employed)				***		
Household size	***	**				
Age of household head				***	***	**
Household net income	***	***	***			

Source: OeNB.

Note: Level for significance: * = <0.1; ** = <0.05; *** = <0.01. Shading indicates the interaction between age and household net income.

Income is shown to be a decisive and highly significant determinant of households' investment decisions in the case of all investment products.[16] Moreover, for capital savings accounts and bonds, but also for life insurance contracts, there is a link to age (which is in turn linked with income); the probability of a household owning these products rises with age, as income does. The housing status is one important determinant for the ownership of a building loan contract. The regression coefficients show that homeowners tend to own such contracts more often than renters do. Moreover, household size has an effect on investment decisions. As expected, the more people there are in a household, the greater the probability is that the household owns a building loan contract.

The housing status also plays a major role in stock and mutual fund share investment. For bonds, the employment status is important: The probability of owning bonds declines for the self-employed, for instance.

[15] For a more detailed description of households grouped in the clusters, see Beer et al. (2006).

[16] Various criteria were used to assess the goodness of the logit estimates. To calculate classification accuracy, logit coefficients were used to determine the probability with which a household owns a particular investment product. While goodness criteria such as Nagelkerke's R square, Cox and Snell's R square and the total classification accuracy produce fairly satisfactory results, the classification accuracy of both subgroups (ownership/nonownership) is only moderately satisfactory.

5. Steps forward

One major step forward was taken in summer 2006. Austria was the tenth country that joined the Luxembourg Wealth Study (LWS).[17] A network, aiming at assembling existing micro data on household wealth into a coherent database to enable cross-country comparisons on household net worth, portfolio composition and wealth distribution. Furthermore, it provides a platform of experts of micro-data on household net worth to share accumulated knowledge and best practices. The integration of the Austrian data in the LWS is under way and should be completed by November 2006.

Table 3

LWS countries and datasets

LWS countries and datasets

Austria	**Survey of household financial wealth**	**2004**
Canada	Survey of financial security	1999
Cyprus	Survey of consumer finances	1999-2002
Finland	Household wealth survey	1994-1998
Germany	Socio-economic panel study	2002
Italy	Survey of household income and wealth	1995-1998-2002
Norway	Income and wealth survey	1997-1999-2002
Sweden	Wealth survey	1997-1999-2002
United Kingdom	British household panel study	2000
United States	Panel study of income dynamics	1999-2001
	Survey of consumer finances	1998-2001

Source: LWS.

In the design and the implementation of the wealth survey there is clearly room for improvement. If the survey were to be repeated, the following changes would seem appropriate:

More time and resources should be devoted to interviewer training (including a better involvement of and information exchange between the central banks analysts and the interviewers). The aim of training interviewers is to improve data collection. Furthermore, trained interviewers should be able to persuade reluctant households to participate in the survey and to monitor the quality of the information collected during the interview. Hence, interviewer training should have a positive impact on both the participation of households in the survey and the quality of the data.

Another step to increase the quality of the data is to replace paper and pencil interviews (PAPI) by computer assisted personal interviews (CAPI). Due to the plausibility checks incorporated in the questionnaire the latter allows for an efficient interviewing and data collection process and guarantees in the end a more precise data set at an earlier stage. Additionally, paradata (ie data on the interviewing process) should be collected. These data

[17] Further information on the LWS project is available at http://www.lisproject.org/lws.htm. A description of this project and Initial results for eight countries can be found in Sierminska et al. (2006), which was also presented at this conference.

can help to reduce unit and item non-response in future surveys and to improve data quality over time.

As mentioned above, oversampling of wealthy households would be highly desirable to get a more accurate depiction of households' wealth. Such techniques are not yet available for Austria, they have to be developed.

If the survey were to be repeated more questions on income (a more detailed breakdown by income sources) and additionally questions on non-financial wealth and consumptions should be added.

Conducting the survey regularly would be highly desirable. Ideally, a panel component should be included.

6. Summary and conclusions

This study discusses the design of the (pilot) survey conducted by the OeNB on households' financial wealth in 2004 and presents an overview of the results of the survey. The central bank's survey of autumn 2004 was the first attempt since 1990 to gather microdata on households' financial wealth in Austria.

Differences in the size and composition of wealth and debt among households are today considered an important source of information for a number of important economic policy issues. Such issues include the transmission of monetary policy impulses or the consumption and saving behavior of households as well as changes in investment structures in financial markets triggered by pension system reforms.

OeNB survey results reveal some interesting links: For example, household income is shown to have a dominant influence both on the size of financial wealth and on investment structures. Moreover, factors like education and the occupational status of the household head play a determining role. These factors, in turn, exhibit a connection to household income. Somewhat more than 40% of Austrian households have taken out loans. Examined by the purpose of the loan, housing loans predominate. The highest level of household debt was found among households headed by persons aged 30 to 39, the reason for indebtedness being the purchase of consumer durables and investment in owner-occupied housing. Consequently, most of the households with negative net financial wealth belong to this category.

Savings deposits and deposits on building loan contracts remain by far the most important investment vehicles of households. 93% of all households have savings deposits; 71% have building loan contracts. These two forms of investment account for an average share of 60% of financial assets. The importance of capital market instruments in household portfolios has risen by comparison to the 1990 survey. Today, 16% of households already state that they own stocks, with stocks representing 7.5% of financial assets. 11% of households own bonds, 11% own mutual fund shares.

The 2004 survey will serve as the basis for further research on topics like asset poverty, financial capability, risk orientation, over-indebtedness and other financial stability issues.

Overall, the results demonstrate the usefulness of microdata on household financial assets and debt for analytical purposes. Microdata on investment permit the establishment of an analytical link between the risk undertaken by households and their capacity to absorb adverse price developments, which is determined among other things by the size of income and financial wealth. Similarly, microdata on debt allow for a comparison of debt with the assets purchased with the loans that constitute debt. The data also make it possible to assess the influence of interest rate and income shocks on households' capacity to repay loans. Households' different levels of financial wealth and differences in portfolio composition

raise expectations that the impact of monetary policy on wealth and hence on consumption and savings also differs markedly among households. Finally, the current promotion of individual saving for retirement by economic policymakers is inducing changes in household behavior, suggesting that such investment will have a major impact on macroeconomic variables and financial markets in the future.

Appendix

Calculation of credit aggregates

Housing credits are loans taken out to buy, restore, construct, adapt or renovate houses or apartments. Loans taken out for other purposes were classified as consumer credits. The households surveyed were asked to state the purpose and size of various types of loans (e.g. bank loans, private loans). No distinction by the purpose of a loan was possible in cases in which households had taken out more than one loan of a particular type for different purposes. In this case, the loans were subsumed under housing loans. Thus, it is likely that the volume of consumer loans is (relatively) understated and the volume of housing loans is (relatively) overstated.

Calculation of the value of life insurances

Households were asked to provide the following information about life insurance contracts: the year in which they took out a life insurance policy, the premium amount and the frequency of premium payments. The value of life insurances is not known and is difficult to assess, as life insurance contracts are not traded in a standardized form like quoted stocks, bonds and mutual fund shares. This approach is considered the best possible approximation; however, the amount invested is highly likely to be understated.

Cluster analysis

Ward's hierarchical clustering method and the partitioned K-means procedure were used as complements. First, the number of clusters was determined with Ward's hierarchical method; this number was confirmed by means of the K-means algorithm.

With the K-means procedure, the centroid of a cluster represents the respective cluster. The procedure defines this centroid and assigns the remaining households to the cluster to whose center they are closest. A three-stage iterative algorithm is used. Starting from an initial assignment of the data points to the cluster centroids (in this case from the group mean values of the clusters determined by means of Ward's method), the households are assigned to the cluster centroids in a way that minimizes the sum of squares of distances between the data and the corresponding cluster centroids. In a next step, the cluster centroids are recomputed. This iteration process is terminated once the modification of cluster centers no longer produces changes in the assignment of the classification objects.

The variables used to draw conclusions about demographic characteristics were the holding of passbook savings accounts, savings accounts, capital savings accounts, premium-aided savings, building loan contracts, life insurance contracts, bonds, stocks, mutual fund shares and holdings in enterprises.

Logit estimates

The following characteristics were taken into account in the computations as independent category variables:

- Head of household: education level, employment, occupational status, type of employment, gender, marital status, age; and
- Household: housing status, size of household, household net income.

Annex of tables

Annex 1

Households' financial assets

			Gross financial assets		Consumer loans	Net financial assets (3-4)		Housing loans	Total loans (4+6)	Net financial assets 2 (3-7)	
	1	2	3		4	5		6	7	8	
	Frequency		Mean	Median	Mean	Mean	Median	Mean	Mean	Mean	Median
		%	EUR								
Austria total	**1,430**	**100.0**	**54,666**	**23,579**	**2,876**	**51,790**	**21,855**	**16,758**	**19,634**	**35,032**	**14,135**
Age of household head											
18 to 29	112	7.8	17,217	6,648	1,402	15,816	5,903	12,300	13,701	3,516	1,386
30 to 39	271	19.0	33,971	17,047	4,920	29,050	13,654	25,280	30,201	3,770	3,097
40 to 49	358	25.0	59,799	35,014	3,749	56,049	34,436	25,725	29,475	30,324	19,787
50 to 59	237	16.6	66,558	36,712	3,101	63,457	35,475	19,156	22,257	44,301	26,155
60 to 69	247	17.3	80,610	29,397	1,600	79,010	28,210	5,448	7,048	73,562	24,848
70 to 79	164	11.5	50,144	17,377	432	49,712	16,756	2,861	3,293	46,851	16,182
80 and over	41	2.8	41,801	16,107	1,906	39,895	14,100	3,976	5,882	35,918	12,740
Occupation of household head											
Self-employed	43	5.0	48,975	14,889	10,762	38,213	11,521	17,360	28,122	20,852	6,928
Entrepreneur	50	5.8	195,101	43,151	5,323	189,778	38,372	26,183	31,506	163,595	18,278
Employee	420	48.4	52,610	27,059	4,011	48,599	24,172	28,015	32,026	20,584	10,935
Public servant	150	17.3	67,468	41,453	3,684	63,784	37,473	22,469	26,153	41,315	24,600
Farmer	19	2.2	35,148	26,722	311	34,838	26,722	9,955	10,266	24,883	10,507
Worker	185	21.3	27,513	17,633	2,974	24,539	15,528	17,862	20,836	6,677	8,475
Jobholders total	**868**	**60.7**	**57,495**	**26,319**	**4,065**	**53,429**	**23,585**	**23,861**	**27,927**	**29,568**	**11,805**
Not employed total	**562**	**39.3**	**50,296**	**20,453**	**1,038**	**49,257**	**19,392**	**5,787**	**6,825**	**43,471**	**16,538**
Net household income											
Up to EUR 749	76	5.3	6,912	3,775	291	6,621	3,583	2,144	2,435	4,477	2,942
EUR 750 to EUR 1,349	297	20.8	16,082	8,753	1,278	14,804	7,750	6,323	7,602	8,480	6,550
EUR 1,350 to EUR 2,249	506	35.4	43,385	23,341	2,209	41,176	21,415	12,514	14,723	28,662	16,049
EUR 2,250 to EUR 2,999	264	18.5	57,151	37,380	2,172	54,979	36,117	23,212	25,384	31,767	21,493
EUR 3,000 and over	287	20.1	124,814	59,768	7,035	117,779	53,039	32,966	40,001	84,813	38,786
Net financial assets											
Net financial assets = median	715	50.0	10,757	9,175	4,125	6,632	7,198	12,229	16,354	-5,597	4,300
Net financial assets > median	288	20.2	34,096	32,344	1,920	32,176	31,748	21,912	23,832	10,264	27,522
Net financial assets > double the median	289	20.2	68,648	64,400	1,022	67,626	63,942	21,865	22,887	45,761	56,987
Net financial assets > five times the med	138	9.7	295,417	179,628	2,279	293,139	179,446	18,770	21,048	274,369	167,800
Marital status of household head											
Single	249	17.4	34,059	10,798	2,359	31,701	10,203	7,609	9,967	24,092	6,617
Married/partnership	851	59.5	70,395	36,031	3,409	66,986	34,514	22,253	25,662	44,733	22,146
Divorced/separated	173	12.1	29,062	14,325	2,977	26,085	11,268	13,749	16,727	12,335	8,970
Widowed	157	11.0	30,312	13,000	696	29,617	12,761	4,806	5,502	24,811	10,975
Housing status											
Owner-occupied housing	798	55.8	64,119	33,158	2,722	61,398	31,935	26,613	29,334	34,785	18,632
Rental housing	633	44.2	42,744	14,187	3,070	39,674	11,911	4,331	7,401	35,343	10,670
Education level of household head											
Mandatory schooling at most	195	13.6	20,197	8,802	1,050	19,148	7,835	6,460	7,510	12,687	7,139
Apprenticeship, vocational/technical school	729	51.0	42,360	21,774	2,462	39,899	19,859	15,109	17,570	24,790	13,991
Academic secondary school, higher-level technical and vocational school	329	23.0	78,503	31,235	3,512	74,990	30,445	23,036	26,548	51,954	19,463
Fachhochschule, University	177	12.4	98,998	45,179	5,411	93,586	41,381	23,209	28,621	70,377	29,387

Source: Authors' calculations based on a FESSEL-GfK survey.

Annex 2

Holdings of savings and capital market instruments

Share of households with investments (%)

	Passbook Savings Account	Building Loan Contract	Mutual Fund Shares	Bonds	Stocks	Holdings in enterprises
Austria total	**85.0**	**70.6**	**11.4**	**10.6**	**15.7**	**2.6**
Age of household head						
18 to 29	69.1	60.3	8.4	5.7	14.8	2.9
30 to 39	82.4	68.2	14.1	6.8	15.2	2.6
40 to 49	87.5	83.6	15.0	11.4	17.5	3.6
50 to 59	87.1	75.3	9.7	12.2	17.2	1.9
60 to 69	86.1	73.6	9.9	14.3	17.2	3.4
70 to 79	87.7	48.4	8.4	12.6	10.5	0.7
80 and over	94.3	44.2	2.8	3.9	6.7	0.0
Occupation of household head						
Self-employed	73.0	59.0	14.0	9.4	20.1	7.4
Entrepreneur	69.1	59.8	20.4	11.3	19.0	28.5
Employee	84.9	77.3	16.0	11.0	19.6	2.2
Public servant	88.4	84.7	15.2	14.0	22.8	3.0
Farmer	95.4	82.2	7.4	10.9	4.1	0.0
Worker	80.4	73.8	6.0	6.1	7.0	0.2
Jobholders total	**83.3**	**76.0**	**13.7**	**10.4**	**17.1**	**3.6**
Not employed total	**87.7**	**62.2**	**7.9**	**10.9**	**13.4**	**1.0**
Net household income						
Up to EUR 749	63.4	39.2	0.3	1.9	1.1	0.0
EUR 750 to EUR 1,349	83.9	54.0	3.5	3.0	5.3	0.2
EUR 1,350 to EUR 2,249	83.9	70.6	8.4	8.9	11.0	2.4
EUR 2,250 to EUR 2,999	90.7	82.4	15.0	13.4	21.9	2.9
EUR 3,000 and over	88.6	85.2	24.5	21.4	32.7	5.8
Net financial assets						
Net financial assets = median	79.0	57.1	3.6	2.3	4.4	0.4
Net financial assets > median	90.7	81.2	9.2	7.3	12.0	3.0
Net financial assets > double the median	91.6	86.6	16.6	15.7	25.9	2.4
Net financial assets > five times the median	90.6	84.8	45.7	50.0	59.8	13.5
Marital status of household head						
Single	74.8	58.5	11.3	7.9	12.1	2.8
Married/partnership	89.1	79.0	13.6	13.1	19.4	3.2
Divorced/separated	79.2	61.8	5.1	6.2	10.7	0.9
Widowed	85.3	53.7	6.7	6.7	6.6	0.9
Housing status						
Owner-occupied housing	89.0	78.6	13.1	13.3	19.4	3.0
Rental housing	79.9	60.5	9.3	7.3	10.9	2.1
Education level of household head						
Mandatory schooling at most	81.3	53.0	3.1	3.4	5.5	0.0
Apprenticeship, vocational/technical school	86.1	71.2	8.4	8.4	12.1	2.1
Academic secondary school, higher-level technical and vocational school	82.7	75.6	16.2	14.1	22.9	3.9
Fachhochschule, University	88.7	78.0	24.3	21.3	28.0	4.8

Source: Authors' calculations based on a FESSEL-GfK survey.

Annex 3

Individual saving for retirement

% of respondents

	Have you taken steps to save for retirement?				Why are you saving for retirement?[1]		
	yes	no	don't know	total	uncertainty about the state pension system	profitability considerations	other
Austria total	**58.8**	**38.6**	**2.6**	100	**69.0**	**29.9**	**11.8**
Age of household head							
18 to 29	45.0	52.0	3.0	100	81.4	15.9	13.9
30 to 39	67.1	29.5	3.4	100	84.7	19.8	5.5
40 to 49	69.3	28.6	2.1	100	78.5	29.4	7.7
50 to 59	61.7	36.5	1.8	100	62.1	30.0	14.3
60 to 69	49.2	48.8	2.0	100	47.0	44.5	18.9
70 to 79	45.1	50.7	4.3	100	49.9	40.5	16.2
80 and over	44.1	52.6	3.4	100	28.0	33.6	39.2
Occupation of household head							
Self-employed	65.8	32.4	1.8	100	73.7	31.6	7.0
Entrepreneur	78.7	20.3	1.0	100	73.6	30.4	10.1
Employee	65.9	31.7	2.4	100	79.0	25.3	10.1
Public servant	70.6	25.9	3.5	100	74.3	33.9	5.6
Farmer	47.4	51.2	1.4	100	78.7	45.0	0.0
Worker	63.3	34.4	2.3	100	80.2	18.8	10.2
Jobholders total	**66.5**	**31.1**	**2.4**	100	**77.8**	**26.5**	**9.0**
Not employed total	**46.8**	**50.3**	**2.9**	100	**49.8**	**37.6**	**17.5**
Net household income							
Up to EUR 749	37.1	58.6	4.3	100	67.8	17.8	21.4
EUR 750 to EUR 1,349	42.1	54.1	3.9	100	65.6	29.6	13.6
EUR 1,350 to EUR 2,249	58.4	39.1	2.5	100	68.6	26.7	12.5
EUR 2,250 to EUR 2,999	66.1	31.3	2.6	100	68.2	32.7	12.6
EUR 3,000 and over	75.7	23.2	1.1	100	71.8	33.6	7.8
Net financial assets							
Net financial assets = median	45.7	50.3	4.0	100	72.8	20.8	14.7
Net financial assets > median	66.2	32.5	1.2	100	73.3	29.3	7.9
Net financial assets > double the median	71.8	26.8	1.4	100	67.0	33.8	10.1
Net financial assets > five times the median	83.5	16.0	0.5	100	54.6	50.2	13.0
Marital status of household head							
Single	57.6	40.2	2.3	100	78.9	19.5	11.2
Married/partnership	63.8	33.9	2.3	100	68.5	32.2	10.7
Divorced/separated	52.7	44.9	2.4	100	74.5	28.5	9.9
Widowed	40.0	54.8	5.2	100	42.9	36.6	25.4
Housing status							
Owner-occupied housing	63.6	34.4	2.0	100	68.4	33.7	10.6
Rental housing	52.7	44.0	3.3	100	69.9	24.0	13.5
Education level of household head							
Mandatory schooling at most	40.2	54.6	5.3	100	71.6	20.5	12.8
Apprenticeship, vocational/technical school	57.9	39.5	2.7	100	69.2	27.7	11.6
Academic secondary school, higher-level technical and vocational school	65.6	32.7	1.7	100	68.1	37.5	10.6
Fachhochschule, University	70.3	28.7	1.0	100	68.4	30.6	12.9

Source: Authors' calculations based on a FESSEL-GfK survey.

Note: These two questions were asked of the respondent directly (not necessarily the household head).

[1] Multiple answers were possible. The sample consists of those households which have saved for retirement.

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Capital gains and wealth distribution in Italy

Luigi Cannari, Giovanni D'Alessio and Romina Gambacorta[1]

1. Introduction[2]

In the last fifteen years, asset prices have undergone sizeable changes. Between 1987 and 1992, the prices of houses rose by about 80 per cent in real terms, decreasing by more than 20 per cent in the following five years, and quickly increasing again thereafter. Stock prices rose until 2000, only to fall by more than 40 per cent in the following two years and then increase yearly by about 15 per cent between 2003 and 2005.

This paper tries to assess the impact of these price variations on the amount of wealth held by Italian households. We focus on the specific role played by capital gains, i.e. wealth variations solely determined by changes in asset prices. Examining capital gains is important in many respects: they directly affect wealth distribution based on their size and dispersion, and they also have an impact on household consumption and labour supply.[3]

In order to explain how capital gains may affect wealth distribution let us consider three families, endowed at the end of the 1980s with the same amount of wealth in cash and the same conditions of access to financial markets. The first family buys the most profitable asset at the beginning of the year, the second one buys the less profitable one, and the third buys a fifty-fifty combination of the two. After two years, the financial wealth held by the first family surpasses by 65 per cent that of the second family, and by 26 per cent that of the third. In 2004, the first family's wealth amounts to 30 times that of the second and 5 times that of the third. Even if we take into account high transaction costs, wealth inequality between these households grows substantially over time. The example is based on very simple hypotheses,[4] but it already tells part of the story: capital gains may have a substantial impact on the wealth of individual households as well as on the shape and concentration of wealth distribution.

The paper is organized as follows. In the next section we discuss the various definitions of capital gains and the main results obtained in the literature. Section 3 reports the macroeconomic estimates, while Section 4 shows the microeconomic analysis, describing the data and the methodology used. The effects of capital gains on the level and the distribution of household wealth in Italy are illustrated in Section 5. Finally, Section 6 reports the main conclusions.

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3 See, among the others, Henley (2001), Mankiw and Zeldes (1991), Attanasio, Banks and Tanner (1998), Paiella (1999). For Italy, Zollino (2001) does not find relevant effects of capital gains on consumption expenditure, while Paiella (2004) shows that the effect of wealth on consumption, although slight, is statistically significant. Wealth variations accruing to real estate appear to influence consumption more than variations in financial wealth.

4 We referred to average returns for each class of assets. This set-up excludes within-class variability in asset prices. For example, between 1987 and 1992, the prices of houses in real terms more than doubled in Milan and Rome while, in the same period, they rose by a mere 10 per cent in smaller cities such as Ancona and Potenza (Bank of Italy, 2002). Price volatility in the stock market is even more evident. Finally, the example excludes intra-annual price variations.

2. Capital gains: definitions and theoretical framework

Definitions

Following the national accounts (NA) definition, capital gains[5] represent the changes in wealth due to the variation in the prices of its components.[6] The overall variation in wealth W_t can be decomposed in capital gains CG_t, net savings S_t and net transfers T_t (transfers received net of transfers paid):[7]

$$\Delta W_t = S_t + T_t + CG_t \quad (1)$$

Capital gains can be classified into neutral CG_t^N, which are related to variations in prices due to the inflation rate, and real CG_t^R for the remaining part:

$$CG_t = W_t \pi_t + \sum_a p_{at} W_{at} = GC_t^N + CG_t^R \quad (2)$$

where W_{at} is wealth at time t invested in asset a, π_t is the average inflation rate, while p_{at} represents the variation in the price of asset a that exceeds the yearly inflation rate.[8]

In what follows we will concentrate on real capital gains, which have effects on the distribution of purchasing power between households. Following the NA approach, we do not distinguish between either cashed and not-cashed capital gains or between expected and unexpected capital gains.[9]

Capital gains are not the only source of capital returns, as the latter may sometimes take the form of income (interest and dividends). Different assets show a different composition of these return components. For example, current accounts generate a capital income (interest) and no capital gains, while some investment funds generate only capital gains. Stocks lie somewhere in between as they yield both income (dividends) and capital gains.

From a conceptual point of view, capital gains differ from capital income in that they are not distributed to the owner, but remain included into the asset value: in order to cash them the owner needs to sell the asset. If the owner does not take any action, capital gains are reinvested in the asset that generated them. In addition, capital gains are much more volatile than capital income. For this reason they can have a different impact on consumption behaviour, especially when high transaction costs discourage the owner from cashing them.

Keeping in mind the different nature of these sources of capital revenue, the NA income definition adopted in this paper includes capital income and not capital gains. Savings are

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5 We use the catch-all "capital gains" label for both positive and negative changes.

6 In a theoretical framework, only price changes unrelated to quality or quantity changes should be employed to calculate capital gains. In practice, the available price indexes do not always account for this. For example, when considering dwellings, the market price index is standardized with respect to the size, location and condition of the house, but not with respect to other possible sources of heterogeneity. Similarly, for stock prices, the MIB index does not disentangle profits that have not been distributed. Nevertheless, these assumptions do not appear to have a large impact on the results, as confirmed by some empirical experiments (for example, we measured the ratio between reserve budget and net capital for industrial firms).

7 This scheme basically follows the definitions of the European System of Accounts (ESA95).

8 The choice of the inflation rate as wealth deflator is not straightforward. Wealth is a reserve of valuables that is normally accumulated for future consumption. In order to deflate wealth properly, it would be necessary to know future prices, interest rates etc. On this topic see Reiter (1999).

9 In the literature the first distinction is mainly related to taxation issues (Haig, 1921; Simons, 1938; Hicks, 1939); for a recent review, see Harris (2001). See also Edrey (2004).

computed as the difference between income and consumption, and therefore do not include wealth variations generated by changes in asset prices.

Where the distinction between expected and unexpected capital gains is concerned, it is worth pointing out that capital gains, despite their high volatility, cannot be considered completely random. When deciding portfolio allocation, investors will take into account the opportunities for both income revenues and capital gains. Following this view, the expected component of capital gains should be added to capital incomes; in this case, the definition of capital gains proper would refer only to the deviation from the average value due to the random component. However, we will not adopt this distinction for two reasons. First of all, it is difficult to select asset price models that account for the time horizon of investors and for their heterogeneity. The estimation of expected capital gains is therefore dependent on subjective assumptions. Secondly, the long-run average of capital gains is normally much smaller than their variability, so that the correction has only slight effects on short- to medium-run estimates.

Capital gains and wealth

The literature dealing with the effects of capital gains on wealth mainly refers to the British and American markets, where share ownership is more common than in Italy and wealth is therefore more dependent on the variability of stock prices. Research has focused mainly on the impact of asset price variations on the economic behaviour of households[10] and less attention has been devoted to the role of capital gains on wealth accumulation and inequality, even if there is a body of evidence showing that this aspect is important. For example, Greenwood and Wolff (1992) find out by way of a simulation model that capital gains are responsible for about one-third of the average growth in household wealth observed between 1962 and 1983 in the United States. Using the same methodology, Wolff (1999) confirms that this result also holds for the following ten years; cohort analysis shows that the contribution is larger for the oldest groups. When considering the effects of capital gains on inequality, Henley (1998) shows that in the United Kingdom between 1985 and 1991 concentration in household wealth grew as a consequence of the variations in house prices; this effect was partially curbed by the rise in the number of house owners.

In Italy, variations in house prices can have a large effect on household net wealth, because real assets account for the lion's share of households' portfolios. On the other hand, the impact on inequality is presumably lower as most families own the house they live in.

In the last few years, Italian households have progressively participated more in the stock market,[11] and the high variability of stock prices has increased the importance of capital gains for both the variance and the distribution of household net wealth. Cannari et al. (2003) show that, during the second part of the 1990s, cross-regional differences in per capita wealth grew as a consequence of variations in the prices of financial assets.

Summing up, the literature on the effects of capital gains on wealth, although mainly related to the British and American economies and adopting a different approach to the one we favour, shows that the contribution of capital gains to wealth is substantial. Thus, given the variation in the composition of portfolios held by Italian households and the recent variability of asset prices, capital gains could have played a significant role in the accumulation of wealth and in the evolution of inequality in Italy. In the rest of the paper we analyse these aspects using NA figures and data from the Bank of Italy's Survey of Household Income and Wealth (SHIW).

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[10] See, for example, Hendershott and Peek (1985), Peek (1986) and ECB (2003).

[11] In Italy, during the 1990s, the share of household wealth invested in the riskiest assets (shares, investment funds and bonds) grew considerably. On these aspects see Cannari, D'Alessio and Paiella (2006).

3. Macroeconomic estimates

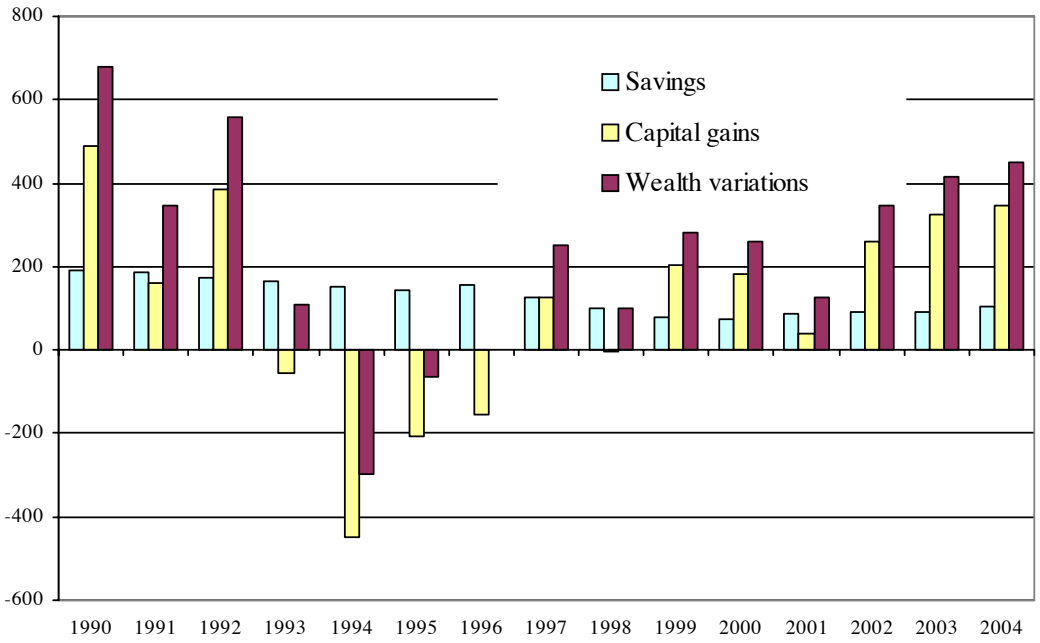
On a macroeconomic level, we can obtain an estimate of the relative importance of savings and capital gains for household wealth using two sources. Savings are derived from NA estimates for households and non-profit institutions. Levels of household wealth are derived, up to 2002, from Brandolini et al. (2004) and updated using the same methodology. Finally, capital gains are obtained as the difference between the variations in wealth and savings.

Figure 1 shows the estimates of household savings, capital gains and wealth variations in the period 1990-2004. Savings, expressed at 2004 prices (using the consumer price index for the whole nation), gradually decreased from €192 billion to €75 billion between 1990 and 2000, rising slightly in the following years.

Figure 1

Household savings, capital gains and wealth variations

Billion euros; 2004 prices



Source: Authors' calculations on data from Istat and Bank of Italy. Savings exclude depreciation. Wealth and savings are deflated using the consumer price index for the whole nation.

On the other hand, wealth variations exhibit a more volatile profile than savings owing to changes in asset prices. In particular, at the beginning of the period wealth changes were mainly driven by house prices, which rose until 1992 and fell by more than 20 per cent between 1993 and 1999, rising again in the following years. In the second half of the period, stock prices greatly influenced wealth variation as they rose until 2000, decreased sharply in the following two years and recovered thereafter.

Overall, between the end of 1989 and 2004, household net wealth at 2004 prices grew by €3,573 billion, from €4,712 billion to €8,285 billion. In the period 1990-2004, household net

saving amounted to €1,920 billion, equal to 53.7 per cent of the increase in net wealth. In the same period, capital gains accounted for almost half of the variations in household wealth.[12]

Between 1990 and 2004 capital gains equalled, on average, 12.6 per cent of households' disposable income, while capital income was equal to 32.1 per cent.[13] It should be noted that capital gains showed high variability during the observed period. During half of the period they exceeded (in absolute terms) one-fifth of disposable income. The sum of capital gains between 2002 and 2004 was equal to disposable income in 2004.

While these results show the importance of capital gains in the process of wealth accumulation, they still do not give any information about the impact on different categories of households and on inequality. These aspects are analysed in the following paragraphs.

4. Microeconomic data

Since 1962 the Bank of Italy has conducted its Survey of Household Income and Wealth (SHIW) with the aim of gaining deeper insight into the economic behaviour of households. The sample includes approximately 8,000 households and is drawn using a two-stage sample design.[14] The questionnaire collects information on demographics, income, consumption, savings, wealth and several other topics. Further details of the survey can be found in Bank of Italy (2006); in the rest of this paragraph, the emphasis will be on the aspects related to wealth evaluation.[15]

Household wealth in the SHIW

Net household wealth is defined as the sum of real assets (dwellings, firms, valuables and durable goods) plus financial assets (deposits, government securities, bonds, shares, etc.) minus financial debts (mortgage and other debts).[16] On the other hand, we do not include in this definition cash, the part of the TFR retirement fund[17] already accumulated, and the actual value of the amount accumulated in private or public retirement funds because these items are not available in the survey. Interviewees were also asked to price each wealth component according to their beliefs.[18] Comparing SHIW data on wealth with those from

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[12] During the 1980s, capital gains were mainly negative and sometimes larger (in absolute value) than savings. Between 1981 and 2004, capital gains represented about 29.6 per cent of real net wealth variation.

[13] Capital incomes include: rents for dwellings and land, distributed profits from corporations and quasi-corporations to households, profits invested abroad, interests, insurance profits and insurance incomes. They do not include mixed incomes.

[14] Since 1989 a part of the sample (about 50 per cent in the last surveys) is composed of households already interviewed in previous surveys (panel households). It is therefore possible to focus accurately on themes such as income, wealth and changes in job status.

[15] In this paper our calculations are based on data from the SHIW historical database, which contains information collected from 1977 to 2004.

[16] Where the distinction between direct and portfolio investments is concerned, firms are regarded as real assets when they are run (completely or partially) by the owner, while they are considered to be financial assets if shares are held only as a form of investment of savings. Consistently with the definition usually adopted in official Bank of Italy publications, durable goods are treated as a component of wealth.

[17] When leaving a job, workers in Italy are entitled to a lump-sum payment, called Trattamento di Fine Rapporto (TFR); it represents a form of compensation due on departure, irrespective of the reason. For further details see Schivardi and Torrini (2004).

[18] The questionnaire does not specify any evaluation criterion for financial assets. We therefore presume that the subjective value provided by the interviewees is equal to the market price at the end of the year for shares,

other sources such as NA, it is possible to notice some differences due to problems with the quality of the data collected in the survey, probably due to non-response of the richest households and to widespread non-reporting and under-reporting where asset ownership is concerned.[19]

It is necessary to account for the fact that response and reporting problems are dependent on the level of household wealth. For this reason we refer to the net wealth reconstruction method proposed by Brandolini et al. (2004).[20] This correction procedure yields a level of net wealth that exceeds the baseline survey estimates by an average of 40 per cent. Furthermore, it modifies the relative shares of wealth components; in particular, it increases the share of financial assets relative to real assets. For example, in 2004, after the correction, financial assets rise from 9 to 15 per cent of net wealth, while real assets decrease from 94 to 87 per cent (Figure 2).[21]

The estimation of capital gains

The estimation of capital gains is based on equation (2) and uses a separate price index for each wealth component. For dwellings (primary residence and other dwellings) we use the average provincial indexes calculated by Muzzicato et al. (2002). These are based on data gathered by the magazine "Il Consulente immobiliare" and modified to account for national price variations observed in the survey, distinguishing between main municipalities and other towns.[22] Land has been priced following Povellato (1997). We assume that durable goods and other valuables do not generate any capital gains; apart from a few exceptions (such as cars and other means of transport), the former do not have a secondary market,[23] and there is no available price index for the latter, which anyway only constitute a small part of wealth. As to the value of firms,[24] we use the deflator of fixed capital stock (not including construction).

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investment funds and other listed assets, and to their nominal value for the rest, such as government securities. On the other hand, when referring to debts, the questionnaire specifically requires the nominal value of the residual capital.

[19] These subjects have been widely studied in the recent past. See D'Alessio and Faiella (2002), Cannari et al. (1990), Cannari and D'Alessio (1993) regarding financial assets, and Cannari and D'Alessio (1990) on dwellings.

[20] The method is as follows: 1) design weights are adjusted in order to account for the different rate of survey participation, as stated in D'Alessio and Faiella (2002); 2) data on financial assets are corrected as proposed in Cannari et al. (1990) and Cannari and D'Alessio (1993); 3) data on non-residential dwellings owned by households are corrected following a method originally proposed by Cannari and D'Alessio (1990) and subsequently refined by Brandolini et al. (2004).

[21] These adjusted values are closer to the macroeconomic ones, although there are still some differences mainly due to heterogeneity in definitions and in classification rules. On these aspects see Brandolini et al. (2004).

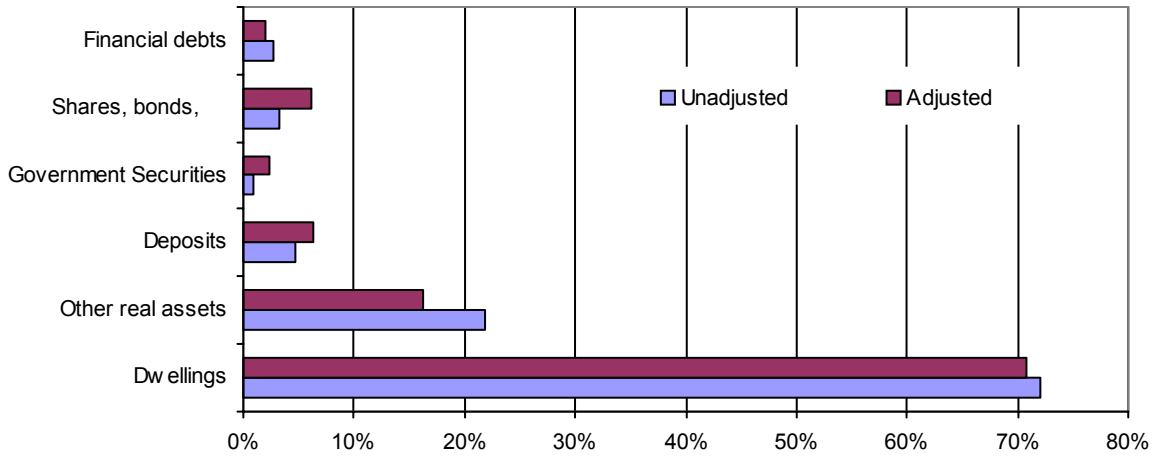
[22] These variations have been adjusted using the national average price changes for houses, as gathered from the survey (net of refurbishing expenses), with the twofold aim of accounting for the differences in prices between large municipalities and other towns and of aligning average revalued wealth with wealth reported by households. Furthermore, we assume that all the dwellings are located where the household head resides.

[23] On the evaluation of capital gains for goods without a secondary market see Hendershott and Peek (1985).

[24] In the survey, the value of firms is computed net of the value of buildings and land used in productive activity, which are instead treated as components of real household wealth.

Figure 2

Shares of net wealth components, 2004: a comparison between adjusted and unadjusted data



Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

Capital gains are calculated for all assets involving share ownership[25] using the MIB historical index.

Capital gains for a given class of fixed-interest financial assets or liabilities are generated by interest rate changes applying to items in that class.[26] An increase in interest rates on the newly issued assets causes a fall in the value of assets already in circulation. Conversely, a rate cut for fixed-income assets produces a positive capital gain for the owner of assets of the same kind. In the same way, but with opposite signs, variations in passive rates generate capital gains for households with fixed-rate mortgages. The impact of changes in rates is higher the longer the time to maturity of the assets held.[27]

Referring to the definition adopted here, deposits and bonds (private and public) with variable interest rates have zero nominal capital gains, and therefore bear capital losses proportional to the inflation rate.

To evaluate the incidence of capital gains on wealth we adopt the Laspeyres index logic. Starting from survey data we estimate the (counterfactual) level of wealth that would have been yielded by capital gains only. In other words, we exclude savings, transfers and other variations caused by changes in the composition of household portfolios. Calculations are conducted both using 1989 as starting year and estimating chain indexes based on pairs of surveys. In the first case wealth composition is fixed at 1989, while in the second it varies between surveys. Of course, results based on chain indexes are closer to reality as they

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[25] This class also includes equity investment funds, whose incidence in total investment funds was estimated based on the data collected in the 2004 survey. Managed savings are regarded as investment fund savings.

[26] In the case of fixed-income assets, we employed the average gross revenue of BTPs (Buoni del Tesoro Pluriennali, i.e. treasury bills with a time to maturity longer than one year), estimated on bonds with an outstanding time to maturity in excess of one year. For debts, we used the interest rate series on medium-term and long-term loans calculated by Casolaro, Gambacorta and Gobbi (2004). Finally, the time to maturity for mortgages was estimated using SHIW data, and time to maturity for fixed-income assets was estimated based on time to maturity of BTPs (Bank of Italy, Base Informativa Pubblica on line).

[27] The series used to calculate wealth (price indexes, interest rates, time to maturity) are presented in Appendix A.

account for the evolution in household portfolios. Therefore, comparing these indexes can be useful for evaluating the effects of changes in portfolio composition on capital gains. In order to simplify the comparison of results, all the wealth components, reconstructed with the methodology described above, are evaluated at 2004 prices, using the consumer price index.

5. Capital gains in Italy according to SHIW data

Capital gains in 1989-2004

SHIW data show that between 1989 and 2004 nominal per capita wealth more than doubled, from €42,000 to €129,000 (Table 1). Per capita wealth, reconstructed from the composition of household portfolios in 1989 applying the relevant price variation to each asset, was equal to €95,000; total capital gains thus equalled 60 per cent of the variation in nominal wealth. Savings, transfers and other effects due to portfolio reallocation explain the remaining 40 per cent.[28]

Table 1

Per capita wealth variation and capital gains, 1989-2004

Euros, percentages

Variables	Average
(a) 1989 wealth at 1989 prices	42,503
(b) 1989 wealth evaluated at 2004 prices using the consumer price index	72,086
(c) 1989 wealth evaluated at 2004 prices using asset price variations	95,181
(d) 2004 wealth evaluated at current prices	129,408
(e) = (c) – (a) Total capital gains	52,678
(f) = (c) – (b) Real capital gains	23,095
(g) = [(d)/(b) – 1]*100 Percentage increase in real wealth	79.5
(h) = (f)/[(d) – (b)]*100 Percentage contribution of real capital gains to wealth increase	40.3
(i) Percentage contribution of real capital gains to wealth increase, calculated with chain indexes	43.6

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

This comparison does not account for the variations in the general price index. Evaluating all figures at 2004 prices, the average per capita wealth in the period 1989-2004 rose by about 70 per cent in real terms, from €72,000 to €129,000. More than 40 per cent of this increase was due to real capital gains.

[28] We refer to per capita wealth in order to control for variations in household size and in the total number of households.

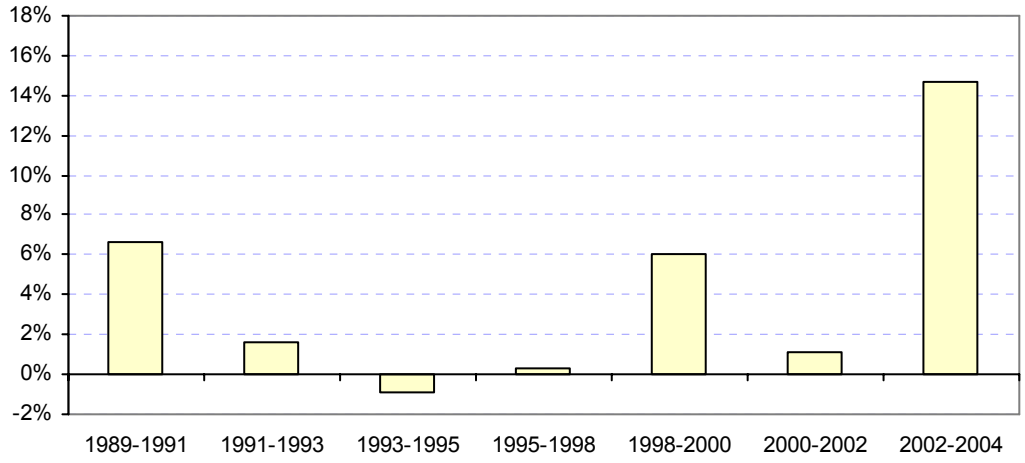
When using chain indexes, the contribution of capital gains to wealth variation does not change much. In this case, per capita wealth variations are estimated for each pair of consecutive surveys, keeping the portfolio composition observed in the first survey fixed. Finally, these results are summed over the entire period. There are no substantial differences between the results based on the two different indexes (1989-based and chain) because a large share of capital gains comes from the growth in house prices, and this wealth component is not subject to frequent reallocation due to the high transaction costs.

Overall, survey data and NA yield similar results: the contribution of capital gains to wealth variation is always positive with an exception, i.e. the sub-period 1993-95, when the real prices of dwellings decreased (Figure 3).

Figure 3

Real capital gains, 1989-2004

Percentages of real wealth



Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

Table 2 shows that in 1989-2004 real capital gains were mainly influenced by the rise in house prices, averaging €28,000 or 63.8 per cent of total wealth held in this type of asset in 1989. Conversely, other assets such as deposits generated capital losses. During the period, the contribution of other wealth components to wealth variation was negligible. In particular, capital gains accruing to shares, although sizeable compared with the amount of wealth held in shares, represented only 1 per cent of total capital gains (€226 out of €23,096).

The analysis of capital gains during individual sub-periods reveals that the contribution of shares was more significant between 1995 and 2002, with a positive sign between 1995 and 2000 and a negative sign between 2000 and 2002. The contribution of land and firms is very small and with changing signs. Fixed-income assets generate only small capital gains on average, with the exception of 1995-1998 when these assets generated €232 of per capita capital gains. The variation in mortgage interest rates also produced few capital gains: the largest amount was between 1995 and 1998, with a per capita capital loss of €88.

Table 2

Per capita real capital gains by source, 1989-2004

Euros, 2004 prices, percentages of wealth amounts of the same category

Capital gain source	1989-1991	1991-1993	1993-1995	1995-1998	1998-2000	2000-2002	2002-2004	Total 1989-2004	1989-2004 Index[1]	1989-2004 Chain index[1]
Dwellings	6395	2512	394	-1356	4406	5240	17356	28147	63.8	71.7
Land	-56	-151	-74	-5	69	14	20	-181	-8.4	-8.4
Firms	111	-57	-213	-88	-9	10	13	-113	-2.4	-2.4
Bonds and BTPs	-61	-22	-69	232	-103	9	5	-157	-31.1	-15.4
Share	-271	-147	97	2474	2626	-2976	-48	226	20.6	20.6
Fixed rate mortgages	28	39	38	-88	-3	11	7	-43	-18.1	8.7
Other assets	-1368	-977	-979	-889	-784	-1072	-456	-4868	-40.9	-37.0
Net wealth	4779	1196	-805	280	6202	1236	16544	23096	32.0	32.3

[1] Percentage of wealth variation due to capital gains for each asset.

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

Distribution and concentration of wealth and capital gains

To evaluate the contribution of capital gains to wealth distribution we consider how these gains were distributed in 1989-2004 among the different wealth classes.[29]

Chain indexes, calculated on per capita wealth, show that the contribution of capital gains to wealth variations increases with wealth itself (Table B.1). This happens because over the period the prices of some assets, such as dwellings and shares, grew on average more than the inflation rate, so that the rich families that owned these assets received higher capital gains than the rest. On the other hand, other wealth components, such as deposits, generated negative capital gains equal to the inflation rate. Thus, households with lower wealth, typically holding mainly this kind of asset, did not gain from price variations (Table B.3).

Capital gains measured with chain indexes show a clear dependence on education: households headed by university graduates have higher capital gains than households whose head has a lower level of education. This result can be due to several factors: a portfolio composition favouring assets, whose prices grew more in the period owing to lower risk aversion and/or higher levels of wealth of more educated households; greater ability on the part of families whose head has a high level of education to change their portfolio composition to include broad categories of assets with higher capital gains; more success in forecasting the price changes of single assets. Survey data provide us with unequivocal evidence that risk preferences differ considerably across individuals and that these

[29] See Table B.1 in Appendix B for the total effect of capital gains in 1989-2004, and Tables B.2 and B.3 for a breakdown of capital gains by sub-period, source and wealth class.

differences have substantial explanatory power with respect to individual decisions. Guiso and Paiella (2005) show, for instance, that the risk-averse tend to invest less in education and are significantly less wealthy than the risk-prone; preferring less variable earnings, risk-averse individuals end up, on average, with lower capital gains. We also find that, in the case of more educated households, the estimates of capital gains based on the chain index are greater than the estimates based on the 1989 wealth composition; on the contrary, the chain index is lower than the fixed-base index for less educated households. This result suggests that educated households are better able to switch their portfolio composition towards more profitable assets than less educated households. Educated households, however, do not seem good at forecasting the future performance of single assets (we will consider this issue in the following sections). While education may help in assessing whether a whole market (i.e., the housing market or the stock market) is likely to be overvalued or undervalued at a particular time, it is less useful in helping households to predict, for instance, the price change of the shares of a single corporation.

Where age is concerned, chain indexes indicate that households whose heads are older reaped smaller benefits from capital gains, probably due to their lower propensity to risk, which generates portfolios that are less sensitive to price variations.

As far as place of residence is concerned, households living in the South or in large cities obtained fewer capital gains over the observed period. This result is mainly due to the fact that in 1993-99 house prices in large cities dropped more than house prices in smaller cities (where prices had grown less during the previous market cycle). In the following years, the trend changed and prices of dwellings grew more in large cities, producing higher capital gains for resident households (Table B.2).

Summing up, capital gains have an important role in explaining wealth variations and produce a differential effect among the various household categories. It is therefore interesting to evaluate the influence of capital gains on inequality and on the inter-temporal mobility of households between wealth classes.

In order to verify the effect of capital gains on wealth distribution we construct a measure of revalued wealth for each year, applying to each asset its price variation. We then estimate the Gini concentration index on this measure. These calculations are made for the whole period of analysis. For each survey we obtain a series of wealth concentration indexes calculated from the portfolio composition of each year and applying asset price variations in the different periods (Figure 4). We can then evaluate the change in wealth concentration over time after the variation in asset prices, *given the portfolio composition and the wealth level of the base year*. During the period, and in particular up to 2000, the concentration indexes show a clear upward trend, confirming the importance of capital gains in the growth of wealth concentration.

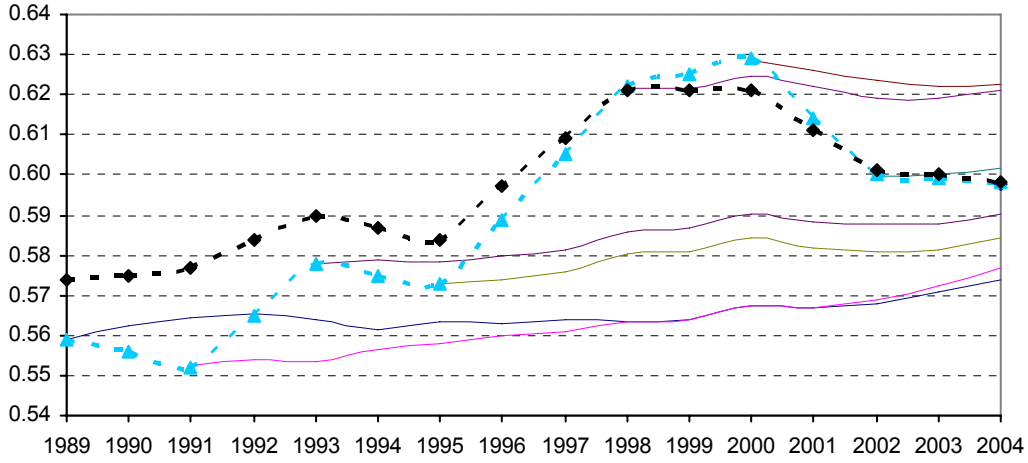
Results obtained so far do not consider changes in household portfolios over time. In order to account for this aspect, we compare the concentration indexes of nominal wealth with the ones estimated on wealth at 2004 constant prices. The bottom dotted line in Figure 4 represents the indexes calculated for each survey using current prices, while the top dotted line refers to concentration indexes calculated with constant prices. The distance between the two lines becomes wider in earlier years; in other words, wealth concentration measured at constant prices tends to be larger than the one measured using current prices, especially during the first part of the period. Between 1989 and 2004 the Gini concentration index rises by 3.9 percentage points; if asset prices are held constant, the increase drops to 2.4 points.

We can therefore conclude that the variation in asset prices contributed to the increase in concentration.[30]

Analysing Figure 4 we also observe that concentration indexes calculated holding portfolio composition constant (continuous lines) are more stable than the other ones (dotted lines). The differences are due to wealth reallocation, the influence of savings on wealth variation (which is not included in the estimation obtained holding portfolio composition constant), and survey sampling factors (sample composition varies across waves, on account of changes in target population and sampling variability).

Figure 4

Gini's index for reconstructed and actual net per capita wealth 1989-2004



Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

Inter-temporal mobility and capital gains

In this section we study the impact of capital gains on the inter-temporal mobility of households between wealth classes. This aspect is not necessarily linked to the previous ones: changes in wealth distribution and concentration do not necessarily imply mobility, and vice versa. For example, if capital gains are a non-negative monotonic function of wealth they affect concentration, but they do not generate mobility; conversely, if all rich households suffer heavy capital losses (becoming poor) while all poor households enjoy large capital gains (becoming rich), the mobility induced by price variability is very high, but the distribution and the concentration of wealth may remain unchanged.

The analysis is conducted by revaluing assets held in the base year using price variations occurring during the period. Results obtained with this method should be interpreted with caution as they are based on the hypothesis that no portfolio reallocation occurs between

[30] These estimates indicate that more than one-third of the growth in concentration is due to price variations. This result must be interpreted with some caution as we do not take into account the fact that households with positive capital gains should increase their consumption and reduce their savings, partially offsetting concentration growth (and vice versa in the case of capital losses). The magnitude of the variations in consumption of each individual depends both on the perception of the persistence of price variation and on his expected residual life.

survey waves. On the other hand, it should be noted that Italian households mainly hold wealth in the form of dwellings, which are seldom an object of reallocation due to the high transaction costs.

The share of panel households that move across wealth classes (defined as wealth quintiles) between one survey and the next is on average 46 per cent (Table 3); 5 to 10 per cent of families change wealth classes as a result of capital gains. The comparison of this result with the transitions actually observed on panel households shows that capital gains explain on average 15.5 per cent of observed transitions.

Table 3

Transition between net wealth quintiles, 1989-2004

Percentage of households

Period	Transitions due to capital gains	Transitions estimated on panel data	Contribution of capital gains
1989-1991	9.4	47.6	19.7
1991-1993	7.4	50.3	14.8
1993-1995	6.2	40.4	15.3
1995-1998	7.6	46.5	16.3
1998-2000	5.0	46.5	10.8
2000-2002	5.9	43.7	13.6
2002-2004	7.9	44.1	18.0
Average	7.1	45.6	15.5

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

Considering that transitions among the panel component of the sample are probably overestimated due to measurement error, the impact of capital gains on wealth mobility is probably underestimated. On the whole, capital gains seem to be an important source of inter-temporal mobility among wealth classes, at least when considering periods of 2 or 3 years. Over a longer horizon, the share of families that change wealth class as a result of capital gains rises, although the increase is less than proportional to the increase in period length: as a consequence of asset price variation, between 1989 and 2004 some 17.9 per cent of families changed wealth class. This happened because a share of the wealth mobility induced by capital gains in short periods is absorbed during the longer intervals, simply reflecting a component of volatility in asset prices.

The role of capital gains in wealth dynamics

In this section we evaluate the contribution of capital gains to household wealth dynamics with respect to the other wealth components (see equation 1), savings and transfers between families (gifts and bequests).

Table 4

Variance decomposition of wealth variations, 1993-2002

Percentages

	Factor	1993	1995	1998	2000
1995	Capital gains	40.9			
	Savings	43.6			
	Received transfers	0.5			
	Given transfers (-)	14.9			
1998	Capital gains	29.9	28.2		
	Savings	40.3	33.8		
	Received transfers	27.8	37.6		
	Given transfers (-)	2.0	0.4		
2000	Capital gains	31.1	32.9	46.2	
	Savings	47.8	40.6	48.7	
	Received transfers	19.9	26.3	4.0	
	Given transfers (-)	1.2	0.2	1.2	
2002	Capital gains	26.6	26.7	35.3	43.1
	Savings	54.3	52.0	51.7	32.4
	Received transfers	18.1	21.1	8.9	17.7
	Given transfers (-)	1.1	0.2	4.2	6.8
Sample size[1]		591	680	1,267	1,750

[1] Panel households that answered to the 2002 monographic section (half of the sample). The number of families is thus equal for all the elements in the same column. The symbol (-) indicates that the component is negatively correlated to wealth variations.

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

For panel households, we considered both the wealth variations due to capital gains[31] and those due to savings resulting from answers given in different waves (values are estimated for years between the waves); variations accruing to transfers were obtained from the 2002 monographic section, which provides retrospective information on this subject.[32] The use of retrospective data gathered in 2002 does not allow the analysis to be extended to 2004. Also, we cannot go back to the very start of the period because the number of panel households that stayed in the sample from 1989 to 2002 is too small. The analysis is carried out with respect to the sub-period 1993-2002.

[31] We normally refer to real capital gains, net of inflation. All components are valued at constant prices.

[32] In this experiment we refer to uncorrected wealth data, because adjustments do not account for the relations among the components considered here. Moreover, on the panel sample we calculate wealth as the sum of its components, rather than taking the raw observations. The difference between these two wealth measures is equal to a residual component due to many factors (measurement errors in the answer, incomplete definition of wealth, variations in household composition).

For each year, the variance of wealth variations can be decomposed using the relation that links the variance of a total with the covariances of the total and its components (Shorrocks, 1983):

$$\mathrm{Var}(\Delta W_t) = \mathrm{Cov}(S_t, \Delta W_t) + \mathrm{Cov}(T_t, \Delta W_t) + \mathrm{Cov}(CG_t, \Delta W_t) \quad (3)$$

It is therefore possible to measure the relative contribution of each component through the following ratios:

$$\mathrm{Cov}(S_t, \Delta W_t)/\mathrm{Var}(\Delta W_t);\ \mathrm{Cov}(T_t, \Delta W_t)/\mathrm{Var}(\Delta W_t);\ \mathrm{Cov}(CG_t, \Delta W_t)/\mathrm{Var}(\Delta W_t) \quad (4)$$

In general, we observe that the contribution of capital gains to wealth variations is relevant and equal to about 35 per cent. Savings explain, on average, approximately 45 per cent of total variance, while net transfers explain about 20 per cent (Table 4).

The small size of some of the samples suggests that these results should be interpreted with caution, partly because the importance of each factor may well vary over time. We can nevertheless observe that for longer periods the contribution of savings increases while the contribution of capital gains decreases. The variance of wealth variation over ten years, between 1993 and 2002, is due for one fourth to capital gains, for more than one half to savings and for 20 per cent to transfers.

Further considerations about price volatility

All the analyses reported in the previous paragraphs have been conducted using average price variations for each asset; we neglected an important part of the volatility, which may be important in explaining the distributive role of capital gains. The price of a house in the city centre can vary in a different way from the price of a house in the suburbs; a family that holds stocks can obtain different capital gains compared with a household with a different portfolio composition.[33]

The variability of price indexes for dwellings and stocks, the wealth components that appear more important in determining capital gains, is quite high. Yearly variations of stock prices between 1990 and 2004 show a standard deviation of about 25 per cent;[34] prices of houses per square metre show a standard deviation of yearly 1989-2004 variations (within provinces and types of municipalities) of about 7 per cent.[35] It is therefore worth evaluating whether and to what extent this residual variability depends on household characteristics.

The monographic section of the 2002 wave asks households to evaluate capital gains (cashed and uncashed) on each asset they hold since it was bought. Based on these data, we study the link between stock price variations and household characteristics; we carry out two kinds of calculations. First we study the linear relation of capital gains, expressed as a percentage of the starting capital, with some characteristics of the head of household (gender, education and working status) and with geographical area of residence, population of the town of residence, family income and year of acquisition of the asset. In the second

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[33] According to survey data from the 1998 wave, households hold, on average, shares of 2.7 different companies. We do not have any further information about the specifics of these stocks.

[34] The estimate refers to the yearly variations in prices of the individual stocks included in the Datastream database.

[35] The variations in house prices between two survey waves, as declared by the owners, show a standard deviation of 20 to 25 per cent within a given province and type of municipality. Considering that the measurement error contained in survey data inflates variability (the Heise reliability index is equal to about 84 per cent; see Biancotti, D'Alessio and Neri, 2004), and taking into account the interval between surveys, we can estimate that owner-estimated yearly variations in house value per square metre have a standard deviation of about 7 per cent.

exercise, the dependent variable is equal to one when there is a positive capital gain and to zero otherwise; we run a logistic regression model with the same independent variables used in the linear model. None of the variables turns out to be significant for any of the models; the sample dimensions are 500 and 700 units, respectively. The results of these calculations do not show the presence of any significant statistical relationship between capital gains and family income or education. This result is not surprising: a substantial body of literature on market efficiency points out that it is very difficult to obtain higher return on assets based only on publicly available information and individual forecasting abilities.

In order decide how to invest their money, three out of four Italian households consult professional agents (banks, post offices, securities firms), while 27 per cent rely on advice from relatives or friends. These results show that no substantial share of households benefits from better information than the rest; everyone relies on either standard formal sources of information or informal non-professional advice which is presumably not particularly efficient or reliable.[36] Moreover, households appear to devote very little of their time to obtaining financial information. According to survey data for 2004, only 5 per cent of households holding financial assets spend more than one hour a week sourcing financial information, while more than 65 per cent do not spend any time at all doing so.

Where real assets are concerned, it is plausible that households normally do not own dwellings - in particular the house they reside in - for speculative reasons. We therefore expect the link between price variations and individual characteristics to be weak, partly because the estimates of house values already incorporate information on location (province and type of municipality) likely to affect the price.

These considerations suggest that for both stocks and dwellings variability around the average value is due to factors generally uncorrelated with observed socio-demographic household features. It is therefore possible to evaluate the impact of capital gains on wealth concentration and variability by simulating the wealth distributions obtained from the variation in average prices, and adding for each family a random element to account for residual variability.[37]

The introduction of this additional variability with respect to the case without random effects that we considered previously generates a slight increase in concentration levels.[38] We conclude that, during the observed period, the contribution of capital gains to the increase in wealth concentration is greater than the one found when omitting this component of variability. Furthermore, the introduction of a random effect increases the contribution of capital gains to transitions among wealth classes; on average, it rises from 15.5 to 19.9 per cent (Table 5). Similar results are found when repeating the exercise of variance decomposition carried out in Section 5.4; if capital gains are augmented by a random component reflected in wealth variation, the share of variability accruing to them increases.

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[36] The data show that only 4 per cent of the households who invest in financial assets are assisted by experts, while 3 per cent decide how to invest based on suggestions offered by the specialised press.

[37] This random component is drawn from a normal distribution with zero mean and standard deviation equal to the one estimated for each of the price variations and then added to the corresponding average. For houses, the estimated yearly standard deviation is 7 per cent. For stocks, we assume that each household owns shares in 2.7 different companies (the average value observed in 1998, the last year for which this information is available), and that the companies are randomly selected. The correspondent standard deviation is about 15 per cent.

[38] Should the random component be positively correlated with the amount of wealth, the effect on wealth would be stronger.

Table 5

Variability effect on households' transitions between net wealth fifths, 1989-2004

Percentages of households

Period	Transitions due to capital gains, without random effects	Transitions due to capital gains, with random effects	Transitions estimated on panel households	Contribution of capital gains without random effects	Contribution of capital gains, with random effects
1989-1991	9.4	10.4	47.6	19.7	21.9
1991-1993	7.4	9.5	50.3	14.8	18.9
1993-1995	6.2	8.7	40.4	15.3	21.4
1995-1998	7.6	10.1	46.5	16.3	21.7
1998-2000	5.0	7.2	46.5	10.8	15.4
2000-2002	5.9	8.5	43.7	13.6	19.5
2002-2004	7.9	9.1	44.1	18.0	20.6
Average	7.1	9.1	45.6	15.5	19.9

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

6. Conclusions

This paper analyses the influence of capital gains on wealth distribution and growth over the period 1989-2004. Estimates were obtained using different data sources.

The main results can be summarised as follows:

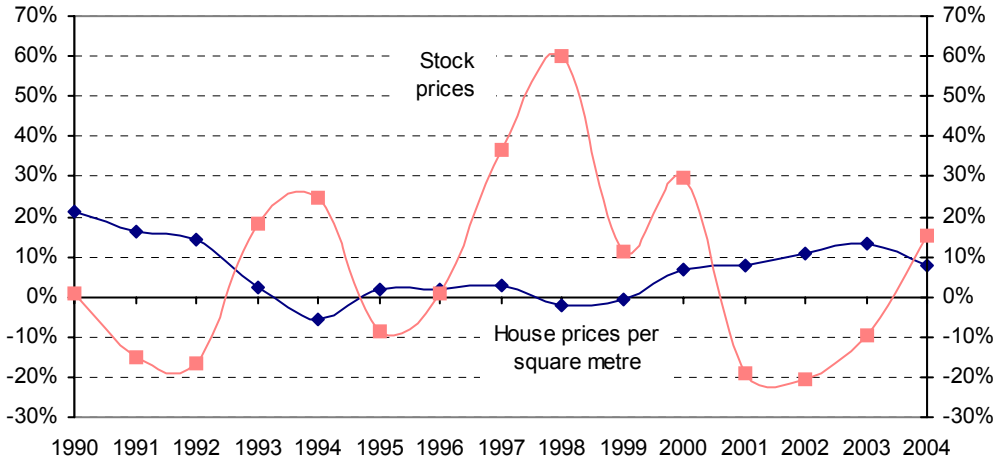
- macroeconomic estimates show that between 1989 and 2004 the net wealth of households (valued at 2004 prices using the consumer price index for the whole nation) increased by €3,573 billion, from €4,712 billion to €8,285 billion. In 1990-2004, total household net saving amounted to €1,920 billion, equal to 53.7 per cent of wealth variation. Over the same period, the contribution of capital gains to total household wealth variation was about 50 per cent;
- between 1990 and 2004, capital gains averaged around 12.6 per cent of household disposable income (which does not include them), while capital income amounted to 32.1 per cent. Total revenue from wealth, including capital gains, is one-third larger than when considering capital income only. It is worth noting that capital gains are highly variable over time and that during half of the observed period they were larger in absolute value than one-fifth of disposable income; in 2002-2004 the sum of capital gains was equal to disposable income in 2004;
- analysing SHIW data, we obtained results qualitatively similar to the NA: between 1989 and 2004, the contribution of capital gains to per capita wealth variation was about 40 per cent in real terms;
- between 1989 and 2004, the Gini concentration index for wealth increased by 3.9 percentage points; if we hold asset prices constant, the increase is 2.4 points. Asset price variation explains more than one-third of wealth concentration dynamics;

- on average capital gains are more than proportionally higher for wealthier families; the effects on concentration are driven by price variations in houses and stocks;
- considering panel survey data, about 46 per cent of families change wealth class (classes are defined by wealth quintiles) between two subsequent surveys. Between 5 and 10 per cent of households change class due to capital gains. Capital gains explain, on average, 15.5 per cent of the actual transitions among wealth classes;
- if we consider a wider time span when observing transitions, the share of households that changes wealth class as a result of capital gains increases, although less than proportionally to variations in the length of the reference period: between 1989 and 2004, 19 per cent of the families changed wealth class on account of asset price variations. A portion of the short-run mobility due to capital gains is absorbed over longer intervals, simply reflecting a component of volatility in asset prices;
- using panel data to evaluate the relative importance of capital gains with respect to both savings and transfers, we find that about one-third of wealth dynamics is explained by capital gains, 45 per cent by savings, and 20 per cent by transfers;
- simulations that account for the variance of each asset price around an average value calculated on a homogenous group of assets of the same kind (for example, the variance of stock prices for a single company compared with the MIB index), suggest that the contribution of capital gains to the growth in concentration and to transitions between wealth classes is probably greater than the one estimated using only average price indexes for each kind of asset.

Appendix A:
Data on asset prices

Figure A.1

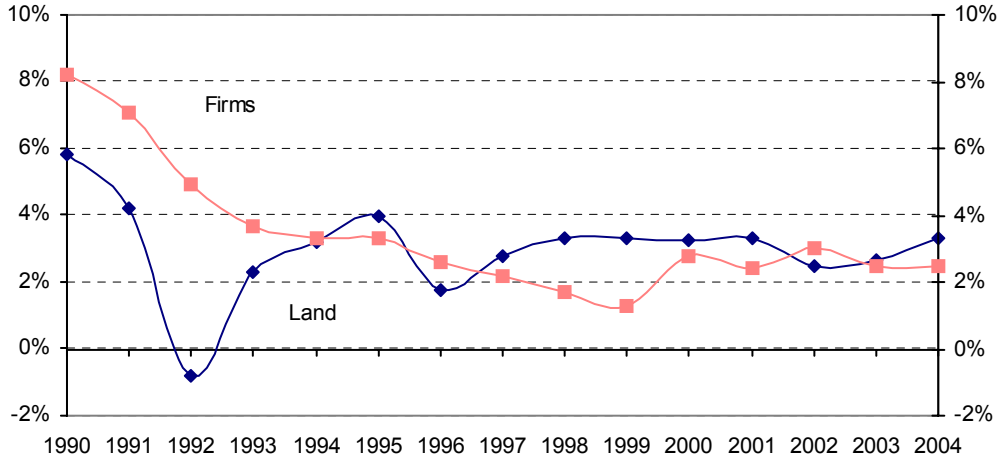
Variations of house prices per square metre and of stock prices, 1990-2004



Source: Stock price index MIB30 (Italian Stock Exchange); value of houses per square metre (calculations based on Muzzicato, Sabbatini and Zollino, 2002).

Figure A.2

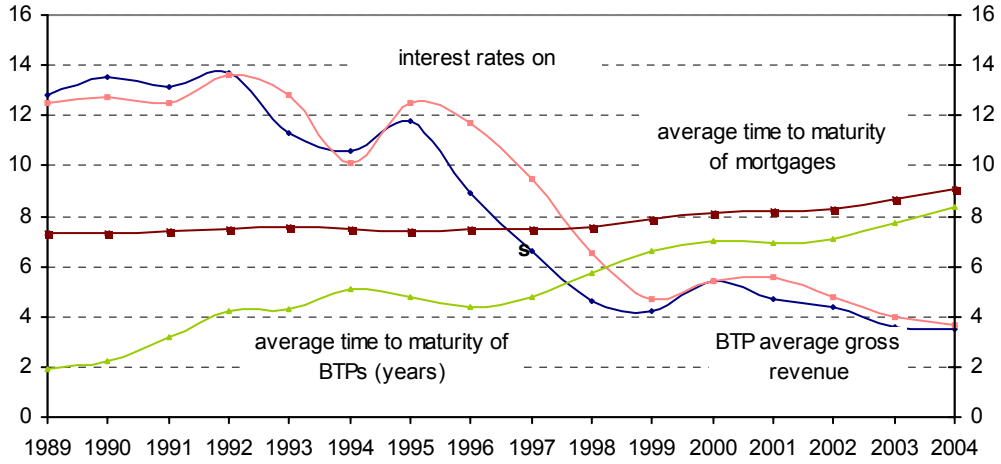
Variations of fixed capital goods (excluding construction) prices and of land prices, 1990-2004



Source: Land price index (Povellato, 1997). Fixed capital stock (excluding construction) deflator (Istat).

Figure A.3

Interest rates and average time to maturity of BTPs and of fixed rate mortgages, 1989-2004



Source: BTP average gross revenue (for bonds expiring after one year): bonds quoted on the Italian Stock Exchange (Bank of Italy, Base Informativa Pubblica on line). Time to maturity of BTPs listed on M.T.S. (Bank of Italy, Base Informativa Pubblica on line). Average time to maturity of mortgages (calculations on SHIW data between 1995 and 2004, under the hypothesis that the mortgage was obtained during the year of acquisition of the house. Data on mortgage time to maturity has been estimated for years preceding 1995). Interest rate on consumer loans, medium-term to long-term (calculated by Casolaro, Gambacorta and Gobbi, 2004).

Appendix B:
Statistical tables

Table B.1

Wealth increase and real capital gains between 1989 and 2004

Percentages

	Per capita wealth growth between 1989 and 2004	Capital gains between 1989 and 2004 on per capita wealth	Capital gains between 1989 and 2004 on per capita wealth (chain indexes)
Gender			
male	72.3	32.7	33.4
female	79.6	29.8	28.5
Age			
up to 30	28.2	32.8	41.1
31-40	65.9	33.6	37.5
41-50	70.0	35.1	35.0
51-65	55.2	30.8	32.4
over 65	98.1	27.5	22.3
Education			
none	72.5	28.7	21.7
elementary school	68.5	32.5	25.5
middle school	45.2	31.2	29.9
high school	67.5	33.3	35.1
university	82.9	31.0	37.2
Work status			
employee	48.9	36.7	40.5
self-employed	82.9	28.2	33.1
not employed	90.1	29.2	22.2
Wealth fifth[1]			
I fifth	21.5	-7.3	-7.0
II fifth	57.9	22.9	20.6
III fifth	81.6	34.9	38.6
IV fifth	79.5	35.4	35.0
V fifth	84.3	32.4	32.1

[1] The I Fifth comprises households whose wealth lies below the first quintile; the V Fifth comprises households whose wealth lies above the fourth quintile. The other Fifths are defined accordingly.

Table B.1 (cont)

Wealth increase and real capital gains between 1989 and 2004

Percentages

	Per capita wealth growth between 1989 and 2004	Capital gains between 1989 and 2004 on per capita wealth	Capital gains between 1989 and 2004 on per capita wealth (chain indexes)
Town size			
up to 20,000 inhabitants	72.0	35.0	34.8
20,000-40,000	116.6	33.9	35.9
40,000-500,000	88.4	29.9	31.2
more than 500,000	37.6	27.8	21.0
Geographical area			
North	76.8	32.1	34.6
Centre	100.9	39.4	34.9
South and Islands	43.2	26.1	24.0
Total	74.2	32.0	32.3

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

Table B.2

Real capital gains between 1989 and 2004

Percentages

	Capital gains as a share of per capita wealth							Chain indexes
	1989 1991	1991 1993	1993 1995	1995 1998	1998 2000	2000 2002	2002 2004	1989 2004
Gender								
male	6.9	2.0	–1.0	0.4	6.1	0.9	14.9	33.4
female	5.6	–0.2	–0.8	0.0	5.9	1.9	14.0	28.5
Age								
up to 30	8.1	3.5	–1.3	–0.4	6.3	4.0	16.0	41.1
31-40	7.7	1.1	–0.1	–0.6	4.8	3.9	16.8	37.5
41-50	8.1	2.6	–1.1	–1.4	6.1	2.3	14.9	35.0
51-65	6.1	0.8	–0.9	0.4	5.7	1.8	15.6	32.4
over 65	2.8	0.3	–1.5	2.9	6.8	–2.0	11.7	22.3
Education								
none	5.2	0.6	–0.4	0.1	4.8	–0.4	10.5	21.7
elementary school	5.0	1.5	–0.6	–0.9	5.5	0.4	12.8	25.5
middle school	6.0	1.9	–0.4	–0.8	5.4	1.9	13.2	29.9
high school	7.7	1.6	–1.1	0.0	6.1	2.1	15.2	35.1
university	7.6	1.0	–1.8	3.3	7.0	–0.1	16.5	37.2
Work status								
employee	8.0	2.1	–0.8	–0.7	6.4	3.5	17.5	40.5
self-employed	6.5	2.2	–0.6	1.0	5.5	1.6	13.5	33.1
Not employed	4.0	–0.3	–1.5	0.9	6.1	–1.0	12.8	22.2
Wealth fifth[1]								
I fifth	–2.9	–1.3	–1.2	–2.2	–0.4	–1.7	2.6	–7.0
II fifth	4.1	–0.2	–1.5	–0.5	4.2	1.1	12.5	20.6
III fifth	7.2	2.6	0.0	–0.9	5.8	3.8	15.7	38.6
IV fifth	6.6	2.4	–0.9	–1.9	5.7	3.3	16.5	35.0
V fifth	7.1	1.3	–1.1	1.5	6.4	0.1	13.9	32.1

[1] The I Fifth comprises households whose wealth lies below the first quintile; the V Fifth comprises households whose wealth lies above the fourth quintile. The other Fifths are defined accordingly.

Table B.2 (cont)

Real capital gains between 1989 and 2004

Percentages

Town size								
up to 20,000 inhabitants	4.4	3.9	0.9	2.6	6.1	0.2	12.9	34.8
20,000-40,000	6.1	2.4	0.0	1.7	6.4	0.6	14.8	35.9
40,000-500,000	5.0	0.8	–0.1	–0.5	6.5	2.3	14.5	31.2
more than 500,000	14.5	–3.8	–8.9	–5.8	4.8	1.9	19.8	21.0
Geographical area								
North	6.1	3.3	0.3	1.6	6.8	0.4	12.4	34.6
Centre	8.5	–2.6	–3.1	–1.4	3.2	4.7	23.8	34.9
South and Islands	6.2	1.3	–2.0	–1.4	6.8	–0.1	11.8	24.0
Total	6.6	1.6	–0.9	0.3	6.0	1.1	14.7	32.3

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

Table B.3

Real capital gains between 1989 and 2004, by source and wealth class

Percentage of net wealth valued at 2004 prices

	1989-1991	1991-1993	1993-1995	1995-1998	1998-2000	2000-2002	2002-2004	1989-2004 Chain indexes
Wealth class[1]	Dwellings							
I fifth	0.90	1.51	0.51	0.01	1.19	0.53	4.15	9.08
II fifth	6.48	2.16	0.81	–0.29	4.56	3.27	13.55	34.06
III fifth	8.93	4.17	1.39	–1.03	5.72	5.36	16.37	47.60
IV fifth	8.38	4.11	0.32	–2.31	4.97	5.42	17.09	43.28
V fifth	9.53	2.89	0.29	–1.60	3.87	4.72	15.06	39.20
Total	8.87	3.26	0.46	–1.58	4.28	4.79	15.38	40.14
Wealth class[1]	Land							
I fifth	–0.03	–0.12	–0.03	–0.01	0.04	0.00	0.00	–0.13
II fifth	–0.05	–0.21	–0.07	–0.01	0.05	0.01	0.01	–0.26
III fifth	–0.07	–0.18	–0.07	0.00	0.04	0.01	0.01	–0.27
IV fifth	–0.08	–0.18	–0.07	0.00	0.05	0.01	0.01	–0.28
V fifth	–0.08	–0.21	–0.10	–0.01	0.08	0.02	0.02	–0.27
Total	–0.08	–0.20	–0.09	–0.01	0.07	0.01	0.02	–0.27
Wealth class[1]	Firms							
I fifth	0.03	–0.01	–0.06	–0.02	0.00	0.00	0.00	–0.06
II fifth	0.10	–0.03	–0.09	–0.04	0.00	0.00	0.00	–0.05
III fifth	0.10	–0.03	–0.13	–0.06	0.00	0.00	0.01	–0.12
IV fifth	0.14	–0.05	–0.12	–0.07	0.00	0.00	0.01	–0.09
V fifth	0.18	–0.10	–0.34	–0.13	–0.01	0.01	0.02	–0.37
Total	0.15	–0.07	–0.25	–0.10	–0.01	0.01	0.01	–0.26
Wealth class[1]	BTPs and Bonds							
I fifth	–0.01	0.00	0.00	0.03	–0.01	0.00	0.00	0.02
II fifth	0.00	–0.02	–0.02	0.14	–0.01	0.00	0.00	0.08
III fifth	–0.02	–0.02	–0.02	0.06	–0.02	0.00	0.00	–0.02
IV fifth	–0.03	–0.02	–0.03	0.12	–0.04	0.00	0.00	0.00
V fifth	–0.13	–0.04	–0.12	0.39	–0.14	0.01	0.01	–0.02
Total	–0.08	–0.03	–0.08	0.27	–0.10	0.01	0.00	–0.01

For footnotes, see the end of the table.

Table B.3 (cont)

Real capital gains between 1989 and 2004, by source and wealth class

Percentage of net wealth valued at 2004 prices

Wealth class[1]	Stocks							
I fifth	–0.03	–0.05	0.02	0.47	0.22	–0.54	–0.02	0.06
II fifth	–0.05	–0.13	0.07	1.37	0.71	–1.04	–0.02	0.90
III fifth	–0.05	–0.08	0.07	1.36	0.77	–0.83	–0.02	1.21
IV fifth	–0.13	–0.13	0.07	1.42	1.33	–1.44	–0.03	1.07
V fifth	–0.58	–0.25	0.14	3.92	3.42	–3.60	–0.06	2.85
Total	–0.38	–0.19	0.11	2.88	2.55	–2.72	–0.04	2.13
Wealth class[1]	Fixed-rate mortgages							
I fifth	0.23	0.17	0.34	–0.26	–0.03	0.05	0.01	0.51
II fifth	0.07	0.12	0.10	–0.21	–0.01	0.03	0.03	0.14
III fifth	0.07	0.09	0.08	–0.16	0.00	0.01	0.01	0.10
IV fifth	0.05	0.05	0.05	–0.09	–0.01	0.02	0.01	0.09
V fifth	0.02	0.03	0.02	–0.08	0.00	0.01	0.00	0.00
Total	0.04	0.05	0.04	–0.10	0.00	0.01	0.01	0.04
Wealth class[1]	Deposits and other residual components							
I fifth	–3.97	–2.81	–1.97	–2.42	–1.80	–1.73	–14.48	–26.33
II fifth	–2.49	–2.11	–2.26	–1.50	–1.09	–1.21	–9.74	–18.95
III fifth	–1.77	–1.33	–1.31	–1.02	–0.69	–0.75	–6.33	–12.59
IV fifth	–1.77	–1.34	–1.09	–0.99	–0.59	–0.72	–5.93	–11.88
V fifth	–1.84	–1.08	–1.01	–0.98	–0.78	–1.06	–6.56	–12.69
Total	–1.90	–1.27	–1.14	–1.04	–0.76	–0.98	–6.70	–13.13
Wealth class[1]	Total capital gains							
I fifth	–2.87	–1.32	–1.19	–2.20	–0.39	–1.69	2.55	–6.97
II fifth	4.07	–0.23	–1.46	–0.53	4.19	1.07	12.48	20.56
III fifth	7.18	2.62	0.01	–0.87	5.82	3.80	15.75	38.64
IV fifth	6.56	2.43	–0.87	–1.92	5.71	3.30	16.52	35.02
V fifth	7.10	1.25	–1.10	1.51	6.44	0.11	13.87	32.10
Total	6.63	1.55	–0.94	0.33	6.03	1.13	14.38	32.30

[1] The I Fifth comprises households whose wealth lies below the first quintile; the V Fifth comprises households whose wealth lies above the fourth quintile. The other Fifths are defined accordingly.

Authors' calculations on data from the Bank of Italy's SHIW Historical Database.

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Greek household indebtedness and financial stress: results from household survey data

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1. Introduction

During the three-year period 2003-2005, bank loans to households grew at a very high rate (almost 30%) and bank penetration into this sector of the economy increased significantly.[2] These developments have amplified the concern that Greek households may be borrowing excessively and that the credit risk taken by banks is high, although the outstanding balance of bank loans to households as a percentage of GDP remains lower in Greece than the euro area average, despite a significant increase in the above period (2005: Greece: 38.0%, including securitised loans or 36.3% excluding securitised loans; euro area: 52.6%).

Aggregate data provide an overview, but are not sufficient to assess the financial position of households, nor can they reveal how financial stress is distributed among them and which household groups face problems in meeting their loan obligations. Detailed data at household level are required for this purpose. In order to examine the degree of indebtedness of Greek households, especially the extent of their borrowing in relation to their income and wealth, as well as other important characteristics of their borrowing behaviour, the Bank of Greece repeated in 2005 the sampling survey conducted in 2002.[3]

2. Description of the survey

The survey was conducted in the fourth quarter of 2005 and covered 6,000 households in urban and semi-urban areas of Greece. A random sampling technique, stratified by geographical district, was used to ensure that the sample was representative of the surveyed population.

The questionnaire covered all household-borrowing categories and, for each type of loan, recorded the term, the initial amount and the outstanding balance of the loan, as well as the amount of the latest instalment paid. It then sought information about the household's income and wealth. In this survey, the questionnaire was enriched with questions about the difficulties encountered, in the respondents' opinion, in servicing properly their loan obligations, in conjunction with the payment of other regular fixed expenses, as well as with questions about whether the respondents had ease of access to bank lending.

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[1] Bank of Greece, Statistics Department. This paper is a shorter version of a more extensive study by the same authors, published on the Bank of Greece website in March 2006.

[2] In the three-year period from 2003 to 2005, the number of bank housing loan accounts grew at an average annual rate of 16%, the number of credit cards at 8% and the number of other bank loan accounts to households at 27%.

[3] The survey was commissioned to TNS-ICAP, i.e. the market research company that had carried out the previous survey.

Full responses (i.e. from all adult members of the household) were received from 3,210 households, thus bringing the average rate of response to 52%, much higher than in 2002 (38.4%).[4]

The rate of response of the originally selected households varies significantly across geographical areas, as was the case in the 2002 survey too. Table 1 shows that the rate of response drops with the increase in the degree of urbanisation of the geographical area: it is relatively small in Athens and high in semi-urban areas, as was the case in the previous survey as well. These data show that, overall, people in major urban centres, especially Athens, are rather cautious of household surveys. In any event, differences in the response rate across geographical areas affect the representativeness of the sample. Therefore, appropriate weights were applied to the data in order to reflect the population structure by area and balance out the effects of this factor. Moreover, the distribution of the sample's household size was adjusted in order to correspond to the distribution of the population according to the 2001 census.

Table 1

Household response rate and urbanisation

(percentages)

	2005	**2002**
Athens	44.8	31.3
Thessaloniki	54.3	38.7
Other urban areas	55.4	44.3
Semi-urban areas	62.8	48.6
Total	**52.0**	**38.4**

These weights restore the representativeness of the sample to the extent that the borrowing behaviour of the originally selected households that did not respond is the same as that of the responding households. However, this cannot be verified and, therefore, the survey results should be interpreted with some caution.

The survey conducted by the Bank of Greece in 2002 had covered only household members aged 25 and over (25+). The new survey covered all household members aged 18 and over (18+). In order to compare the results of the two surveys, the main characteristics of household borrowing are assessed on the basis of both the responses of all household members that participated in the 2005 survey (i.e. the 18+ sample) and their members aged 25+.

Table 2 shows that 46.9% of households reported some outstanding loan. For households of which only the 25+ members have been taken into account, this percentage stands at 47.7%, i.e. a little lower than in 2002 (48.4%). This small difference is not statistically significant, but the fact that this percentage remained almost unchanged cannot be considered compatible with the high rate of increase of bank lending to households in 2003-2005.

[4] See Mitrakos, Simigiannis and Tzamourani (2005).

Table 2

Indebted households by loan category

	Percentage of households (%)						Average debt (in euro)		
Loan category	**2005, 18+**		**2005, 25+**		**2002, 25+**		**2005, 18+**	**2005, 25+**	**2002, 25+**
Without debt obligations	53.1		52.3		51.6				
With some debt obligations	46.9	100.0	47.7	100.0	48.4	100.0	19,665	19,637	15,532
Housing-related loans		37.3		38.0		37.2	42,366	41,701	29,557
- Loans for house purchase		28.4		28.7		27.5	48,789	48,156	33,187
- Loans for house repair		9.9		10.3		10.7	18,539	18,403	16,877
- Loans for land acquisition		0.9		1.0		1.0	28,224	27,401	7,430
Other loans		81.7		81.2		85.3	6,389	6,275	4,246
Bank loans other than housing-related		77.8		77.2		75.5	6,552	6,447	4,048
- Credit card debt		54.4		54.1		53.1	3,047	3,039	1,701
- Loans for car purchase		20.8		20.1		20.9	7,495	7,159	5,815
- Other bank loans (personal, consumer, etc)		28.9		28.9		29.4	6,552	6,570	2,979
Credit from retailers		9.0		8.9		16.3	1,256	1,254	1,294
Loans from other households		1.2		1.3		2.8	5,612	5,496	12,447

It seems that some of the responding households did not report any outstanding loans, because households are generally cautious when it comes to sampling surveys or because of the very personal character of the questions, the complexity of the questionnaire or the volume of information requested about household borrowing. To the extent that these reasons apply, the behaviour of non-responding households can be considered similar to that of responding ones and, therefore, valid conclusions may be drawn about the borrowing behaviour of all households with outstanding loans. If, however, because of a specific borrowing behaviour (e.g. large number or excessive amount of loans or similar reasons directly associated with borrowing behaviour), households refrained from stating their loans or even participating in the survey, the representativeness of the sample is affected and the survey results will be biased and will not accurately reflect the characteristics of the entire population. However, when the survey data are compared with data submitted by banks to the Bank of Greece, the following points come to light: the average outstanding balance of housing loans per household, as recorded by the 2005 and 2002 surveys, increased at an average annual rate of 12.1%, while the corresponding balance per account, as calculated from the relevant bank data, increased at an average annual rate of 11.3% over the same

period.[5] In addition, the households' average outstanding balance of credit card loans, as shown by the sampling surveys, rose at an average annual rate of 21.3% during 2003-2005, while the corresponding balance, as recorded by banks, increased at an average annual rate of 19.4% over the same period.[6] Consequently, the annual growth rates of these two categories of loans, as calculated from bank and survey data, do not differ substantially. This corroborates the view that the borrowing behaviour of non-responding households is generally similar to that of responding households and, therefore, boosts the reliability of the survey results.

3. Analysis of the results

As shown in Table 2, the breakdown of households by category of loans remained almost unchanged in the period between the two surveys. The most common type is credit card loans, as 54.4% of households with outstanding loans in 2005 had debts to credit cards. The increased use of credit cards for payments[7] and the easy access to such type of loans, within the limits of each card, explain why they are so widespread, despite the fact that bank interest rates for these loans are the highest among all categories of loans.[8] The second most common category is housing loans (37.3%), followed by unsecured bank loans (28.9%, being mainly personal and hire-purchase loans).

The percentages of households by category of loan do not differ substantially if the sample is limited to household members aged 25+ (see Table 2). However, the comparison between the two distributions (2005: 18+ and 25+) shows that loans by household members aged 18 to 24 relate to, at a much higher percentage than loans to household members aged 25+, loans for car purchase rather than housing loans.[9]

Moreover, as shown in Table 2, the percentage of households with outstanding housing loans in 2005 is higher than in 2002. This is in line with the rapid increase in housing loans, since new housing loans are contracted, as a rule, by different households. The average

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5 The outstanding balance of housing loans per account (according to bank data) stood at €34.9 thousand at end-2005 (including securitised loans), from €25.3 thousand at end-2002. Respectively, the outstanding balance of housing loans per household (according to the 2002 and 2005 surveys) rose to €41.7 thousand in 2005, from €29.6 thousand in 2002 (see Table 2). Therefore, the outstanding balance of housing loans per account is lower than the average outstanding balance per household, indicating (as in the surveys) that a number of households have more than one housing loan. However, the relation between the two aggregates remained virtually unchanged, since the outstanding balance per account corresponded approximately to 85% of the outstanding balance per household, indicating that the number of accounts per household did not change substantially over this period.

6 Specifically, the outstanding balance of credit card loans, as recorded by banks, stood at €8,445.4 million at end-2005 (including securitised loans), compared with €4,957.2 million at end-2002. Respectively, the outstanding balance of credit card loans per household, as recorded by the sampling surveys, stood at €3,039 million in 2005, compared with €1,701 million in 2002. It should be noted that, if account is taken of the outstanding balance per household, the data are adjusted for the fact that the number of households is different in the two surveys, thus making the evolution of credit card loans comparable between banks and the surveys, given that the number of Greek households remained almost unchanged during 2003-2005.

7 At end-2005, two credit cards corresponded to every three persons aged 20 and over. Moreover, the data submitted by banks to the Bank of Greece show that in 2003-2004 the number of credit card transactions increased at an average annual rate of 15% and the value of these transactions at a rate of 37%, reaching €5.4 billion in 2004 (2002: €2.9 billion).

8 At end-2005, the average interest rate on credit card loans was 13.78%, compared with an average of 8.26% for all consumer loans and an average of 3.91% for housing loans.

9 Specifically, 35.4% of household members aged 18-24 reported a car purchase loan and 9.2% a housing loan.

outstanding balance of household housing loans amounts to €42,366. Specifically, for the 25+ sample, this balance comes to €41,701, increased by 41% compared with the corresponding figure of 2002. The amount of housing loans, as recorded in the 2005 survey, leads to the estimate that the total outstanding balance of this category of loans came to €26.2 billion, corresponding to about 70% of the outstanding balance of housing loans, as reported by banks.[10] However, available information is not sufficient to examine whether this significant deviation between the survey-estimated total indebtedness and the bank-recorded outstanding balance of housing loans is due to the fact that a relatively small percentage of households has reported some loan or whether it reflects the possibility that borrowing is more concentrated among households that refused to take part in the survey.

By contrast, the percentage of households reporting 'other', non-housing, loans (perhaps in addition to housing loans), declined in 2005 (81.2%) compared with 2002 (85.3%). This drop concerns all categories of loans and is particularly marked in the case of retail store credit. The sole exception is credit card loans, as the percentage of households with loans of this category has picked up slightly. The rising trend of the percentage of households with credit card loans, as established by both surveys, is in line with the fact that both the number of credit cards and the amount of credit card loans increased at high rates in the period between the two surveys (at an average annual rate of 8% and 19.4%, respectively). The increased use of credit cards and bank competition in this sector of retail banking seem to be directly associated with the significant decrease in the percentage of households with retail store loans between 2002 and 2005. Moreover, it is very likely that part of household loans from retail stores, especially those for purchases by instalments paid by credit card, was not properly recorded by the survey, since households perceive the amounts of this type of credit as loans from banks rather than retail stores or consider that they have no outstanding debt to the extent that they pay the entire balance of their credit card each month. Apart from housing loans, the average of other bank loans to households amounts to €6,552, or €6,447 for households with members aged 25+, i.e. it stands about 60% higher than in 2002. The total outstanding balance of this category of bank loans to households, estimated on the basis of survey data, amounts to €9 billion and corresponds to 40% of the outstanding balance of these loans, as recorded by banks. Therefore, the deviation between the two amounts is significantly higher for this category of loans than for housing loans. This result may reflect the fact that, apart from regular information sent to households by banks on the outstanding balance of their debt, the outstanding balance of housing loans changes less over time than in other categories of loans. As with housing loans, available information does not help to examine whether this significant deviation between the survey-estimated and bank-recorded outstanding balance of loans is due to the fact that the percentage of households reporting a loan is relatively small or whether it reflects the possibility that borrowing is more concentrated among households that refused to take part in the survey.[11]

The borrowing level per household is increased in all geographical areas and, as established by the 2002 survey, there are differences between geographical areas as to both the borrowing level per household and the types of loans (see Table 3). However, it is observed that the borrowing level per household is more evenly distributed among areas in 2005 than in 2002.

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[10] As a rule, housing loans are paid in biannual instalments. In the period March-August 2005, i.e. six months before the survey, the average outstanding balance of housing loans, as recorded by banks (including securitised loans), amounted to €38.1 billion.

[11] The deviation between the survey-estimated amount of loans and the amount recorded in the macroeconomic figures is a common phenomenon. For instance, in a similar survey conducted in 2004 in the UK by the Bank of England, the estimated outstanding balance on the basis of survey data corresponded to 80% of the effectively recorded balance for housing loans and 32% for unsecured bank loans (mainly consumer loans). See May, Tudela and Young (2004).

Table 3

Distribution of indebted households (25+) per type of loan and degree of urbanisation

(Percentage of households)

	Athens		Thessaloniki		Other urban areas		Semi-urban areas		Total	
Types of loan	2005	2002	2005	2002	2005	2002	2005	2002	2005	2002
Housing-related loans	36.1	35.2	42.6	34.9	39.7	41.8	38.5	37.2	38.0	37.2
Other loans	83.7	87.9	77.2	82.5	81.7	82.5	76.3	83.1	81.2	85.3
Bank loans other than housing-related	79.5	80.0	74.3	72.2	76.3	75.0	73.0	67.6	77.2	75.5
- Credit cards	64.2	62.5	48.5	44.4	48.9	45.5	39.5	38.7	54.1	53.1
- Loans for car purchase	14.7	20.4	21.8	26.4	26.0	19.9	24.9	19.9	20.1	20.9
- Other bank loans (personal, consumer, etc)	27.7	28.4	32.7	30.2	27.6	32.2	32.0	26.5	28.9	29.4
Credit from retailers	9.4	16.3	6.9	14.3	11.7	15.0	4.7	21.3	8.9	16.3
Loans from other households	1.5	2.7	1.9	4.0	0.9	2.1	1.7	3.6	1.3	2.8
Average outstanding debt (in euro)	20,020	14,596	18,118	16,250	18,834	15,615	20,346	18,506	19,637	15,532

Note: Percentages do not add up to 100% because some households may have more than one kind of loan (e.g. a housing and a consumer loan).

The breakdown of indebted households by category of loans shows that the percentage of households with a housing loan picked up in 2005, compared with 2002. To a large extent, this reflects the increased number of indebted households in the major urban areas of Athens and Thessaloniki, namely in areas where, according to National Statistical Service of Greece (NSSG) data, the owner-occupation percentage was lower than the country average,[12] and therefore (at least potentially) there was higher demand for housing loans. At the same time, the degree of penetration of the banking system into these areas is higher. Unlike housing loans, the percentage of households reporting loans other than housing loans declined significantly in all areas, except "other urban areas", where the decline is very small. As already mentioned, this reflects the fact that households borrow mainly from retail stores and, to a lesser extent, from friends. By contrast, the percentage of households that, in the 2005 survey, used the banking system to finance their needs increased or remained unchanged compared with 2002.[13]

[12] According to NSSG data, the owner-occupation percentage stands at 80.1% throughout the country and is distributed as follows: Athens: 70.9%, Thessaloniki: 78%, other urban areas: 76%, semi-urban areas: 87.6% and rural areas: 97%. See NSSG, "Household Budget Survey 2004/2005".

[13] Specifically, the percentage of households with credit card loans increased in all areas. In Athens, approximately two-thirds of indebted households reported credit card debts, while in Thessaloniki and the "other urban areas", this percentage came close to 50%. On the other hand, the percentage of households with other bank loans (except housing and credit card loans) stands around 30%, with small deviations by geographical area and fluctuations between the two surveys. Specifically, the percentage of households with loans for car purchase declined in Athens and Thessaloniki in 2005 and increased significantly in "other urban" and semi-urban areas, where 25% of indebted households reported a loan of this category in 2005, i.e. a much higher percentage than in Athens (14.7%) or Thessaloniki (21.8%).

4. Distribution of debt in relation to household income and wealth

Households' borrowing level seems to be correlated with their income,[14] since, as shown in Table 4, the average debt per income group increases as income increases, although this correlation is less marked in 2005 than in 2002.[15] [16] At the same time, the income distribution of households that reported some type of debt obligation in the 2005 survey is different from the respective 2002 distribution. In 2005 there has been a significant decrease in the percentage of households in the first income group[17] (from 8.3% in 2002 to 5.4% in 2005) and a smaller decrease in the last income group, while percentages increased in other income groups, especially the fourth highest income group (from 16.3% in 2002 to 19% in 2005). For this reason, the distribution of the contributions of each income group to total household debt in 2005 is substantially different from that in 2002. The contribution of the first income group remained very small in 2005 (2005: 3.4%, 2002: 3.5%), while the contributions of other income groups are more evenly distributed in 2005, since the contribution of the third highest income group decreased significantly in 2005 (from 32.8% in 2002 to 26.9% in 2005), mainly to the benefit of the fourth highest income group (from 19.6% in 2002 to 27.1% in 2005). These figures show that the access of low-income households to the banking system remains limited, while it seems that, in the framework of a more effective credit risk management, competition between banks for attracting customers is more focused now than in the past on households of the fourth highest income group, since not only the percentage of households of this level has increased, but also the outstanding balance of their loans recorded the highest average absolute increase. In any event, the vast acceleration of credit expansion to households in 2003-2005 resulted in a substantial increase in the overall burden of indebtedness, as measured by the debt-to-income ratio. The median[18] of the debt-income ratio for all households rose to 33.5% in 2005, from 22.8% in 2002, mainly reflecting the growth of housing debt. It should be noted, however, that the debt-income ratio of households in the first income group increased substantially compared with 2002 (2005: 61.2%, 2002: 25.7%) and is much higher than the average debt-income ratio of all households.

The distribution of debt in relation to household wealth (household financial and real assets) is similar to that of debt in relation to income. On average, the level of households' debt increases with the increase of wealth and households in the higher wealth groups have generally higher outstanding loan balances. Indeed, this positive correlation between the level of loans and wealth became more pronounced in 2005 (see Table 5). It should be noted that, despite the increase in the percentage of participation in the sample of households of the first wealth group in 2005 (2005: 17.4%, 2002: 16.8%), their contribution to total household debt dropped to 4.7% in 2005 from 5.2% in 2002. It should also be noted that, as in 2002, the contribution of households of the higher wealth groups to the total debt is much bigger than their participation in the sample, indicating that these groups have generally larger debts. Indeed, the contribution of households in the top two wealth groups to total

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[14] The net disposable income of each household member was reported in the questionnaire.

[15] On average, the income of households with loans (€22,600) is higher than the average income of all households that took part in the survey (€18,100). It should also be noted that the average income of all households in the survey approaches, to a satisfactory extent, the average income of households in the country as a whole (€20,500), as recorded by the NSSG Household Budget Survey 2004/2005.

[16] A positive relationship between income and levels of debt was also found in Cox, Whitley and Brierely (2002).

[17] Income groups range from lowest to highest, the first group corresponding to the lowest income etc.

[18] The median was chosen over the average on the basis of the observation that the distribution of the loan burden is characterised by a significant positive asymmetry, since there are few but important extreme values that affect the average disproportionately.

household debt was 65.3% in 2005, compared with 70.9% in 2002.[19] For 50% of households, the ratio of their outstanding debt to their wealth, i.e. the median of this ratio, does not exceed the very low level of 10.7%, despite its increase from 5.1% in 2002. The median of the debt to wealth ratio is relatively high (75.8%) only for households in the first wealth group and there is a number of households whose outstanding debt -attributed to non-housing loans- exceeds their total wealth. Certainly, this does not necessarily mean that these households are or will be insolvent, since the level of their income may provide adequate security that they will be able to service their loans properly.

Table 4

Distribution of indebted households per income group (25+)

Income groups	Distribution of indebted households (% of households)		Contribution to total outstanding debt of sample (%)		Average outstanding debt (in euro)		Median of debt to income ratio (%)	
	2005	**2002**	**2005**	**2002**	**2005**	**2002**	**2005**	**2002**
up to 7,500	5.4	8.3	3.4	3.5	12,637	5,684	61.2	25.7
7,501-15,000	28.2	27.8	22.5	19.0	15,655	10,238	37.7	29.2
15,001-25,000	34.5	33.5	26.9	32.8	15,325	14,783	29.4	22.8
25,001-35,000	19.0	16.3	27.1	19.6	27,976	18,182	34.2	15.4
35,001+	12.9	14.1	20.1	25.1	30,597	25,898	28.1	11.0
Total[1]	**1.215**	**1.063**			**19,637**	**15,532**	**33.5**	**22.8**

[1] Amounts refer to all the households that have some type of loan, and they present the number of these households, the average amount of outstanding debt and the median of debt to income ratio accordingly.

5. Debt-service costs and income

Table 6 and Chart 1 show the distribution of the debt service cost ratio, which is defined as the ratio of monthly instalments to monthly income and constitutes a generally accepted indicator of the direct financial stress on a household. These figures show that, for 80% of households, debt-service costs do not exceed 32% of their income, while for 88% of households, they do not exceed 40% of their income. Therefore, for the vast majority of indebted households, the direct financial stress lies within limits that are not thought to impose difficulties in the regular servicing of loans,[20] although, for households with very low income and precisely because of this very low income, low debt-service ratios are not necessarily an adequate criterion of their difficulty to repay their loans regularly. Households with relatively low debt-service ratios are not evenly distributed across income groups, but

[19] Data per loan category show that this mainly reflects the distribution of housing loans, since taking a housing loan means that property is acquired. By contrast, the contributions of the wealth groups to the aggregate of other, non-housing debt are relatively uniform, indicating that households do not need to own property to have access to 'other' loans (non-housing loans).

[20] See, for example, Garman and Forgue (1991) or Lytton, Garman and Porter (1991).

their percentage increases in higher income groups and, for this reason, the percentage of households with high financial costs is higher in lower income groups, as might be expected. In the lowest income group (households with income up to €7,500), only 53% of households has debt-service costs up to 32%, while in the highest income group, this percentage rises to 92% of households.

Table 5

Distribution of indebted households per wealth group (25+)

Wealth groups	Distribution of indebted households (% of households)		Contribution to total outstanding debt of sample (%)		Average outstanding debt (in euro)		Median of debt to wealth ratio (%)	
	2005	**2002**	**2005**	**2002**	**2005**	**2002**	**2005**	**2002**
up to 10,000	17.4	16.8	4.7	5.2	4,696	4,127	75.8	30.3
10,001-50,000	18.6	11.6	8.5	5.2	8,060	5,977	16.5	9.4
50,001-100,000	23.5	22.4	21.4	18.7	15,923	11,070	8.0	6.1
100,001-200,000	25.3	26.8	30.5	35.3	21,163	17,479	7.4	4.2
200,001+	15.3	22	34.8	35.6	39,899	21,078	5.0	1.4
Total[1]	**1131**	**978**			**19,637**	**15,532**	**10.7**	**5.1**

[1] Amounts refer to all the households that have some type of loan, and they present the number of these households, the average amount of outstanding debt and the median of debt to wealth ratio accordingly.

For the remaining 12% of households, this ratio is over 40%, while for a small percentage of households (1.6%) the debt service cost ratio exceeds the household's monthly income, indicating that, at least in the short term, these households are under strong financial stress. The distribution of the debt service cost ratio in 2002 shows that it did not exceed 32% for 75% of households and 40% for 83% of households, while it exceeded 100% for 4% of households. These figures indicate that the rapid increase in bank loans to households in the three-year period between the two surveys does not seem to be associated with an increase in financial stress. By contrast, households' financial stress eased considerably for all households in the upper half of the debt service ratio distribution and more precisely for those whose the debt service cost ratio is larger than 13,5%, ie for those households for which the financial stress is indeed more pressing. This result is undoubtedly associated with the decrease in bank lending rates to households. It should be noted that bank interest rates on the outstanding balances of the main categories of consumer and housing loans declined in 2003-2005 by 122 and 81 basis points, respectively.[21] To some extent, however, this improvement should also be attributed to the fact that banks manage credit risk more effectively, especially as regards the process for the approval/granting of new loans and risk

[21] These refer to consumer loans with a maturity of up to 1 year and housing loans with a maturity of over 5 years. For a €100,000 housing loan maturing in 15 years, the decrease in interest rates by 81 basis points has reduced the debt payment by €42.4 monthly.

taking. It should also be mentioned in this regard the guidelines of the Bank of Greece[22] on the implementation of a longer-term and more forward-looking policy in this field than what competition forces banks to apply in order to preserve or increase their share in retail banking. It should be noted, however, that the share of debt of the households with a debt service ratio over 40% in the total debt of the sample is relatively high and stands at 29.9% (the share of debt of those with a debt service ratio over 100% is 6.1%). Although, a large percentage (over 80%) of the debt of households with a debt service ratio over 40% concerns housing loans, their relatively high share in the total sample debt indicates that there is significant room for further improvement in credit risk management by banks.

Table 6

Debt service to income ratio (%), 25+

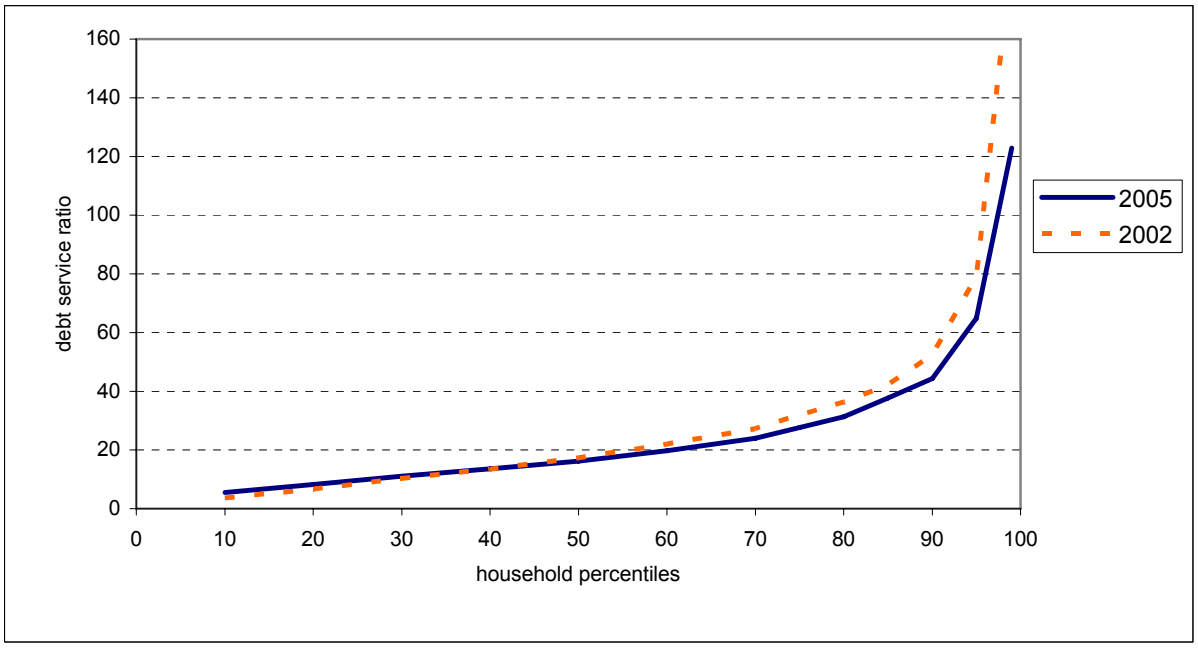
Household percentiles[1]	2005	2002
10	5.6	3.7
20	8.3	6.7
30	11.0	10.4
40	13.6	13.4
50	16.2	17.3
60	19.7	22.1
70	24.0	27.3
75	27.6	32.0
80	31.3	36.3
85	37.6	42.1
90	44.3	52.4
95	64.9	79.3
99	122.8	189.1

[1] Percentage of households with debt service to income ratio less or equal to the corresponding value presented in the table, e.g. for 20% of households the service to income ratio did not exceed 8.3% of their income in 2005.

[22] It is noted that in order to contain the credit risk and prevent phenomena of excessive household borrowing, by relatively recent Governor's Acts, the Bank of Greece increased the provisioning ratios for all types of consumer loans in arrears for over one year or in permanent delay (Bank of Greece Governor's Act 2557/26 January 2005). It also stipulated that the reduced capital requirements ratio (4%) for credit risk shall henceforth be applicable only for the part of the housing loan not exceeding 75% of the market value of mortgaged property, while an 8% ratio shall be applicable for the remaining 25% (Bank of Greece Governor's Acts 2564/11 October 2005 and 2565/11 October 2005). At the same time, a circular stipulated that debt payments should not exceed 30-40% of the income of indebted households, depending on the absolute level of the applicant's disposable income.

Chart 1

Debt service to income ratio (25+)



6. Loan servicing by households

As was mentioned above, the 2005 questionnaire included a number of questions about households' behaviour in relation to the regular servicing of their loans, as well as any difficulties encountered, in their opinion, in meeting their various financial obligations. The relevant responses show that 11.2% of households do not pay their loan instalments regularly, but this percentage varies significantly across loan categories. The highest percentage is observed in consumer loans, where 14.9% of households reported that they do not pay the instalments for servicing these loans regularly, while the corresponding percentage for housing loans is reduced almost to half (8.6%). These percentages, though not entirely comparable with the percentages of corresponding bank loans that, according to data submitted by banks to the Bank of Greece, are not serviced for at least three months,[23] lead to exactly the same conclusion, i.e. that consumer loans have an overall higher credit risk for banks than housing loans.

Table 7 shows the percentages of households per income group reporting "difficulties in regularly servicing their obligations",[24] which are high. Overall, these percentages, although generally lower than those reported in the NSSG Household Budget Survey 2004/2005, seem to confirm the result of the latter, where 77.3% of households reported difficulties in meeting their needs.[25] A general conclusion (see Table 7) is that a very high percentage of

[23] See below.

[24] Households responding to the relevant question that it is "difficult" or "rather difficult" to meet their financial obligations.

[25] This percentage is the sum of the percentages of households that responded to the question of the NSSG Household Budget Survey 2004/2005 "how do you meet your needs?": with great difficulty (18.2%), with difficulty (23.8%) or with some difficulty (35.3%).

households (over 50%), especially in low-income groups, has difficulties in servicing their obligations. To a large extent, this reflects the low level of income of these households and, therefore, the relatively high marginal utility they attribute to each unit of their income, given that the average costs of servicing their loans is relatively low, with the exception of households in the first income group. However, the high percentage of households reporting difficulties in servicing their loans gives rise to questions as to whether the information available to banks is adequate to assess properly the solvency of their customers, all the more so since these households mainly belong to low-income groups and, therefore, their financial position is more vulnerable to any rise in interest rates or change in economic conditions. It should be noted that the percentage of households in the two lowest income groups (84.4%) with non-housing loans (i.e. unsecured loans) is higher than for total households (81.2%). It is possible that the decision of banks to grant loans to this category of borrowers is based on the fact that they have regularly paid their obligations in the past. However, it cannot be ruled out that banks granted loans on the basis of inadequate information concerning the exact characteristics of these borrowers. In any event, increased competition between banks and the high availability of bank funds, indicated by the rapid increase in non-housing loans during the past four years, seem to be directly associated with the relatively high percentage of consumer loans not serviced for at least three months, which, according to data submitted by banks to the Bank of Greece, stood at 7.8% of total loans in this category at end-2005, from 8.5% at end-2002. By contrast, in the case of housing loans, where banks usually have better information as to the borrowers' characteristics, the decline in the corresponding percentage was more pronounced (almost reduced to half) over the same period and it now stands at much lower levels (2005: 3.6%, 2002: 6.9%).

Table 7

Qualitative assessment of households regarding the degree of difficulty[1] in servicing their obligations per income group, 25+

(percentage of households)

They faced difficulties in:	Total	Income groups (in euro)				
		<7500	7501-15000	15001-25000	25001-35000	>35000
Meeting repayments of their housing loan	53.8	83.3	61.3	58.7	48.9	32,8
Paying the instalments of their credit card	54.2	75.8	64.6	51.7	51.6	36.0
Meeting repayments of other bank loans	67.0	87.5	78.7	63.6	66.7	50.0
Meeting repayments of loans from retailers	53.5	85.7	47.6	50.0	-[2]	-[2]
Paying their rent	61.6	84.1	66.9	54.3	33.8	25.0
Paying their utility bills	50.0	71.0	56.1	45.2	35.5	22.7
Median of debt service ratio	**16.0**	**28.3**	**21.6**	**15.8**	**14.2**	**10.7**

[1] The table presents the households that in the relevant questions answered that they found 'difficult' or 'somewhat difficult' to meet their financial commitments. [2] The number of households in these income groups is too small.

7. Access to bank lending

According to the survey data, almost all (96%) households without any loans reported that they had no reason to borrow. A very small percentage (a mere 3%) reported that the borrowing process was not completed because the bank rejected the relevant application, a finding indicating that bank lending is very easy. However, the small percentage of rejections is in complete contrast with the data submitted by banks to the Bank of Greece, according to which the percentage of rejection at the final stage of customer assessment varies between 35% and 40% of loan applications.

Moreover, the responses of households concerning the transfer of outstanding loan balances from one bank to another show that a rather limited percentage of households changes credit institutions, despite intense competition between banks to attract customers and shape their share in these segments of the retail banking market. The highest percentage (6.4% of households with such a loan) concerns consumer loans, where the most attractive benefits are offered from gathering all the accounts in one bank with significantly lower interest rates.[26] A very small percentage of households (1.6%) reported the transfer of car purchase loan balances, while the percentage of households that reported a transfer of a housing loan balance is somewhat higher (3.2%).

8. Conclusions

Certain basic conclusions are drawn from the above analysis concerning household borrowing, as reported in the 2005 and 2002 surveys.

1. Despite the large increase in bank loans to households in the three-year period between the two surveys and despite the significantly increased response of households to the 2005 survey, the percentage of indebted households remained virtually unchanged. All the same, the comparison of the results of the two surveys with the developments, as recorded by aggregate bank data, gives valid indications corroborating the view that a number of general conclusions may be drawn, especially concerning the trends established by the results of the two surveys.

2. The most common category of loans is credit card loans, followed by housing loans. In both cases, the percentage of indebted households that reported such type of loans was increased in the 2005 survey, but not to the extent indicated by aggregate bank data. However, the average debt, both for cards and housing loans, of the households that took part in both surveys increased in the period 2003-2005 at an average annual rate almost equal to that of bank data. This provides a significant indication that the borrowing behaviour of non-responding households is generally similar to that of households that took part in the survey and, at least concerning this point, increases the reliability of its results.

3. As in 2002, the 2005 survey shows that the average household debt grows together with income and wealth. This relationship is particularly strong for housing debt and much weaker for 'other' loans (as a whole). Specifically, the results of both surveys indicate that access of low-income households to the banking system remains limited, while the percentage of indebted households in the fourth highest income group increased, as did their contribution to the total debt of the sample. This seems

[26] For transfers of credit card loan balances from one bank to another, certain banks offer zero interest rate for an initial six-month period.

to indicate a significant qualitative change in competition between banks, which, in the framework of more effective credit risk management, seem to concentrate more now than in the past on attracting customers from upper income groups. At the same time, rapid credit expansion has led to a higher debt-to-income ratio, i.e. the debt burden of households, in all income groups.

4. The analysis of the results of both surveys shows that, for the vast majority (88%) of indebted households, the direct financial stress, as calculated by the debt-service ratio, i.e. the instalment to income ratio, does not exceed 40% of their income, i.e. it lies within limits considered acceptable, in the sense that this debt-service ratio should not result in difficulties in the regular servicing of household loans. At the same time, in the period between the two surveys, financial stress declined significantly for the households in the upper half of the debt service ratio distribution, i.e. for those households for which the financial stress was more pressing. This improvement is associated with the decrease in bank interest rates but, to some extent, it should also be attributed to more effective credit risk management by banks, in compliance with the guidelines of the Bank of Greece calling for the implementation of a longer-term and more forward-looking policy in this sector than what competition may force banks to implement in order to preserve or increase their share in retail banking. It should be noted, however, that the share in total household debt of the remaining 12% of households, i.e. those with debt-service costs over 40%, is substantial (29.9%), though, to a large extent, it concerns housing loans. The high share in total debt suggests that households themselves should assess more carefully their ability to service their loans regularly. At the same time, there seems to be considerable scope for further improvement in credit risk management and the selection of bank customers, so that the extreme household financial stress values can be gradually reduced or/and eliminated. The banks' policy seems to be geared to this direction, also in line with the rules imposed by the Bank of Greece. However, apart from the caution exhibited by households themselves in undertaking loan obligations, the information available to banks about the solvency of their customers must be improved, especially for credit card loans, as they represent a higher credit risk for banks. However, any one bank cannot satisfactorily measure or approach these customer characteristics if borrowers have relations with many other banks, as in the case of credit card loans. The expansion of the Greek Credit Bureau "Tiresias S.A." database and the access of banks to a more adequate information system[27] should lead to fewer bad debts and should make a significant contribution towards further improving the stability of the financial system, reduce the cost of capital, lay the foundations for more effective bank intermediation and support a higher rate of economic growth.

[27] It should be noted that, for credit card loans, the relevant information system of "Tiresias" had recorded 1,960,021 credit cards at end-2005, corresponding to loans totalling €1,792 million, compared with 5,771,585 cards which, according to banks' data, were in circulation at end-2005 and a total outstanding balance of loans of €8,445 million (including securitised loans).

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The distribution of assets, debt and income among Chilean households[1]

Paulo Cox, Eric Parrado and Jaime Ruiz-Tagle V

I. Introduction

During the last decade, Chilean households' debt has been growing considerably faster than their income. Aggregate measures show that the amount of debt as a percentage of income has reached 58% recently from 30% at the end of 2001. This substantial debt growth has raised important questions about debt sustainability, households' financial strength, and the possible impact on the financial system.

So far, aggregate measures of household debt have been the only instrument to monitor the risks associated with the financial exposure of households in Chile. The problem with such measures is that they could be hiding the genuine financial situation of many households that could suffer greater financial stress. To work around this problem, it is necessary to analyze the financial position of the household population and their distribution.[2] Thus, the paper tackle the issue using the most recent Social Protection Survey (EPS, for *Encuesta de Protección Social*),[3] which represents an important innovation that helps to characterize Chilean households both socially and financially.

Several interesting results emerge from the analysis. First, a relatively small fraction of households - the richest quintile - accounts for 57% of liabilities and 43% of assets, which contrasts with the low shares held of the two lowest income quintiles (14% and 24% of debt and assets respectively).

Second, the distribution of assets is less concentrated than is the distribution of debts, due mainly to the fact that home ownership is rather widespread among all households. Real estate assets account for 88% of total assets, and over 75% of households in all quintiles report owning their homes. In contrast, while 64% of debt is associated to mortgage, only 16% of households hold such debts. Since assets are at least eight times the amount of debts in all quintiles, households of different income brackets may have enough support for their debts.

Third, the distribution of indebtedness over the life-cycle indicates that relatively younger households are more likely to be running debts, although most of the debt is held by middle-age households. Mature households hold the major part of the assets, and ratios of debt to

[1] We thank valuable comments by Kevin Cowan, Pablo García, and seminar participants at the Central Bank of Chile and the BIS IFC conference on "Measuring the Financial Position of the Household Sector." We also thank the editorial assistance of Consuelo Edwards. The views expressed in this article are those of the authors and do not necessarily reflect the opinions of the Central Bank of Chile.

[2] This sort of microeconomic analysis has become common practice by central banks of developed countries that monitor financial stability. For example, Tudela and Young (2003), May, Tudela and Young (2004), and Barwell, May and Pezzini (2006) carry out a similar analysis for the United Kingdom, Bucks, Kennickell and Moore (2006) do the same for the United States and Johansson and Persson (2006) review the Swedish case.

[3] The EPS is supported by the Superintendency of Social Security of the Ministry of Labor and is conducted by the Department of Economics of University of Chile. The EPS was first applied in 2002 and later at the end of 2004 and beginning of 2005.

income and debt to assets are low for all ages. This implies that debts are following income flows and that households accumulate assets as they turn older.

Fourth, households with higher education and/or employment contracts have larger proportion of debts. This suggests that loans are mainly allocated to those with higher present or future expected incomes, which are also less volatile.

Fifth, 80% of households have more assets than debts, while 9% have no debts or assets at all. The remaining 11% are households that have negative net worth, and hold 18% of total debt. The financial conditions of those households with negative worth indicate that only a quarter of them are under high financial stress.

Finally, most of the debt identified in the survey appears to have gone to those who are better suited to afford it. Financial fragility is only observed in 4% of households, but they hold only 9% of the total debt. Consequently, we find no strong evidence to support that households are particularly over-indebted and represent a threat to the financial system.

The paper is organized as follows. Section II provides a historical overview of household debt growth in Chile in the last fifteen years, outlining the main issues related to debt growth and income behavior. Section III describes the data and the methodological issues associated with the distribution of debt and assets across Chilean households. Section IV analyzes households' net worth, while section V presents estimations of debt service payments as a key element of financial vulnerability of households. The final section summarizes the main results of the paper and their implications for financial stability.

II. Household debt growth in Chile in the 1990s and 2000s

1. Stylized facts

Debt's growth rate has been enormous and has constantly surpassed that of GDP during the last ten years. Although debt growth in Chile can be considered moderate compared to other emerging economies,[4] the debt service burden has been maintained relatively high given the weight of consumer credit in the composition of the debt.

In real terms, households' banking debt has almost tripled, while real GDP increased nearly 50% during the same period (Figure 1). Banking debt's real annual growth rate averaged 19% between 1991 and 1998, fostered by the economy's strong growth through the first half of the 1990s. Although banking debt diminished its pace after the crises that hit several emerging economies, averaging only 5% between 1998 and 2003, it was spurred again by the economy's recovery, with a 15% jump between 2003 and 2006. This implied that total banking debt increased to 23% of GDP in 2005, from 15% of GDP in 1996.

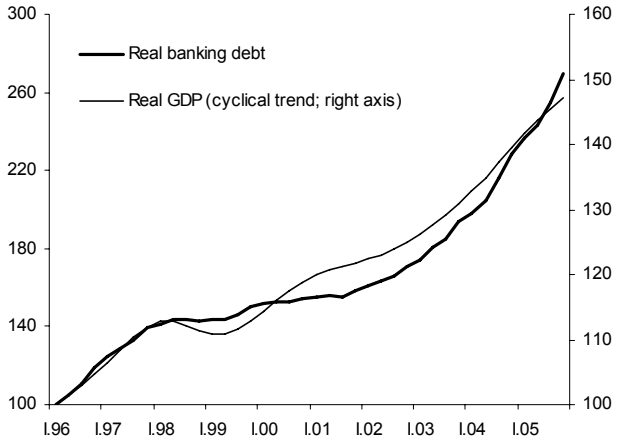
Although banking debt is and has been the main component of total debt, its share has been declining over the last several years with the expansion of credit issued by nonbanking institutions (Figure 2.a). In fact, nonbanking debt went to 28% of total debt in 2005 from 22% at the end of 2001.

[4] See IMF's Global Financial Stability Report 2006. See also Djankov, McLiesh,and Schleifer (2007) and Debelle (2004) for international comparisons and analysis of macroeconomic impact of rising household debt.

Figure 1

Household's banking debt and GDP growth

Index; March 1996 = 100



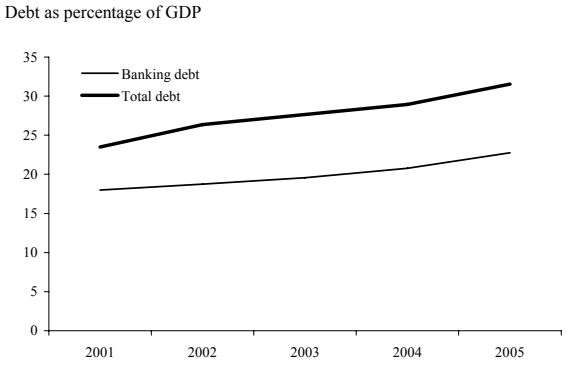
Source: Central Bank of Chile.

Total debt growth has also grown more than households' disposable income, which is reflected through the debt to income ratio (DIR). The DIR reached 55% in December 2005 from 37% at the end of 2001. The aggregate debt service burden[5] has also expanded significantly, though less than total outstanding debt growth, because higher debt has been financed with lower rates and longer terms. The debt service to disposable income ratio (DSR) reached 18.7% in September 2006 from 11.3% in December 2001 (Figure 2.b).

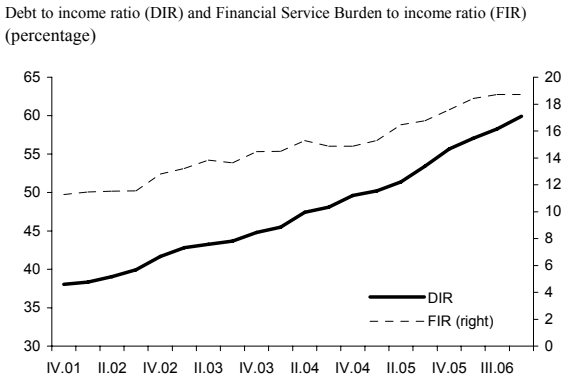
Figure 2

Household debt indicators

a. Debt as percentage of GDP



b. Debt to income ratio (DIR) and debt service to income ratio (DSR), percentage



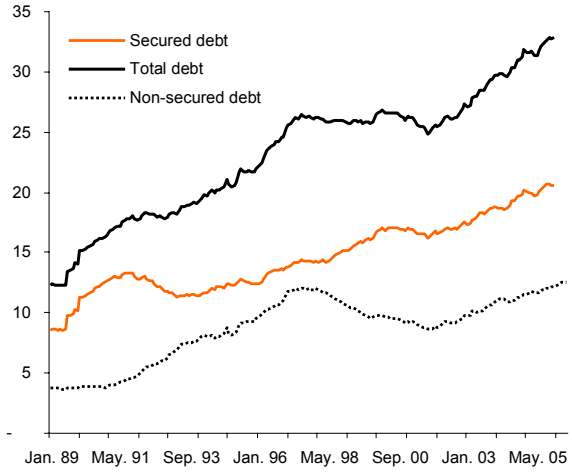
Source: Central Bank of Chile.

[5] The debt service burden is defined by the amount of the debtor's resources allocated to paying financial obligations, both principal and interest.

Figure 3

Banks' exposure to household debt

As percentage of total banking loans



Source: Authors' own calculations with data provided by SBIF.

The strong expansion of household debt has implied higher exposure of the banking system to the household sector. Banking exposure, measured as the sum of total mortgage and consumer outstanding loans as a percentage of total outstanding loans, has increased to more than 33% in 2005 from 15% at the beginning of the 1990s (Figure 3). This expansion has been driven by unsecured debt mainly associated with consumer loans. Therefore, within the banking system, exposure is higher not only because of relatively higher household banking debt, but also because of a higher share of unsecured debt.

2. Explaining households higher level of indebtedness

Fundamentals and financial deepening

Despite the remarkable debt growth described above, there are important fundamentals supporting the debt expansion of households. Income growth has hit record highs during the last several years and both real and nominal interest rates have fallen to their lowest levels in decades. In addition, there is higher stability (less volatility) in the business cycle,[6] which smoothes disposable income fluctuations.

These fundamentals represent both demand and supply effects. On the one hand, lower interest rates and higher current and expected incomes have supported credit demand. Recent growth in both mortgage and consumer loans is rooted in attractive credit conditions such as lower interest rates and longer terms, which have kept the financial burden from growing at debt's pace. Besides, there is evidence of housing price appreciation during the last four years,[7] which allows higher mortgages and their associated equity withdrawal

[6] See, for example, Franken, Le Fort, and Parrado (2006).

[7] Cox and Parrado (2006) show that actual effective transaction prices for homes in Santiago have increased 14% since the end of 2001.

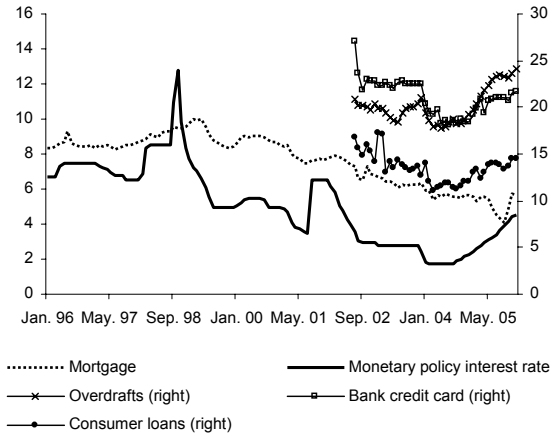
effect.[8] On the other hand, higher income growth and improved macroeconomic stability increase expected incomes, which foster lending from financial institutions to households because of higher expected repayment capacity. Lower interest rates have been observed in all types of credit products in the aftermath of the 1998's monetary tightening (Figure 4.a). There is an additional factor underlying supply effects. Higher growth and less volatility of household income, together with lower interest rates, have reduced the level of default risk measured by most common risk indicators of the banking system (arrears and nonperforming loans) (Figure 5.b). This combination of demand and supply forces has contributed to both higher levels of credit and greater exposure of banks to households.

Financial deepening has also been mentioned as a key factor explaining credit growth in the household sector, through a less direct mechanism. Macroeconomic stability and financial development have improved internal financial conditions for borrowers, especially companies, traditionally the most important destination of banking funds in Chile. As nonbanking financing has risen (through bond issuance; IPOs) the banking industry has become more interested in lending to micro debtor niches or markets such as small firms and lower-income families.

Figure 4

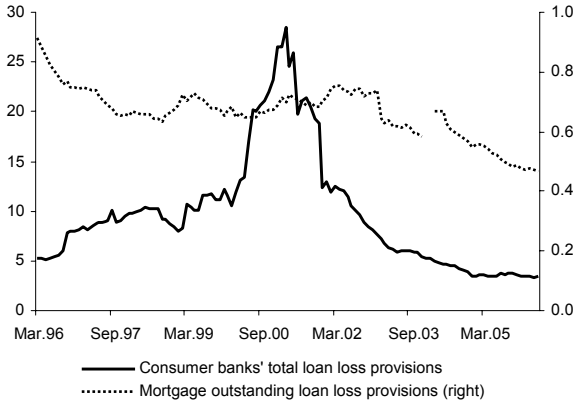
Interest rates and credit indicators

a. Monetary policy interest rate and credit product's interest rates, percentages



Source: Central Bank of Chile and SBIF.

b. Credit risk indicators[1], as percentage of outstanding loans



[1] Measured as risk indicators of mortgage loans and consumer loans of the banking system.

Source: Central Bank of Chile and SBIF. Author's own calculation.

Changes in labor markets

Some recent trends observed in the labor market may also help to explain long term debt growth in Chile. These include higher female participation, which increases, all things equal, households' current and expected income, reducing overall household income volatility; and higher number of formal workers, which is an indicator of sustainable income. In addition,

[8] Mortgage equity withdrawal is borrowing that is secured on the housing stock but not invested in it, so it represents additional funds available for reinvestment or to finance consumption.

real mass salary, an aggregate measure of household income, has expanded significantly. Real mass salary summarizes information of labor productivity and population growth. As the population growth rate has been notoriously decreasing in the last decade, an expansion of mass salary indicates higher productivity. All trends improve households' access to and capacity of indebtedness in the credit market.

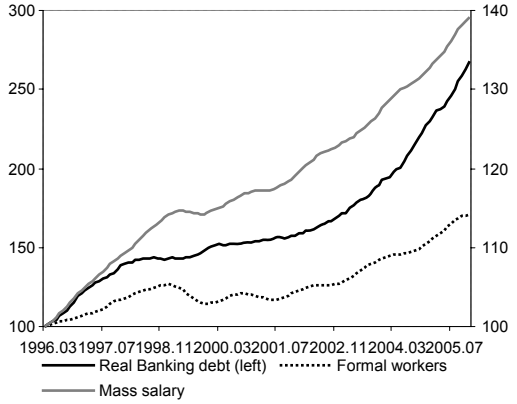
Total banking debt increased with the expansion of both formal workers and mass salary during the last decade (Figure 5.a). All variables remained stable during the economic downturn in 1999 and 2000, and then recovered when the economy found its growth path again. A similar trend is observed when comparing households' banking debt with the female participation in the labor market (Figure 5.b).

Figure 5

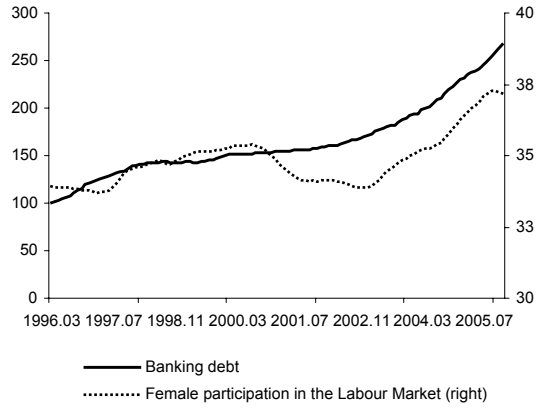
Households' banking debt and labor market

Index; March 96 = 100

a. Households' banking debt, formal workers and mass salary



b. Households' banking debt and female labor participation



Source: Central Bank of Chile.

III. Distribution of debt and assets among Chilean households

This section analyses the distribution of debt and assets according to income, age and employment vulnerability. All breakdowns have the purpose of shedding light on the relevance of the levels of debt, assessing how important they are for households' financial well-being and overall financial stability. The distribution of debts and assets according to income allows determining the ability to payback debts and hence, it helps to identify the households who are financially more vulnerable to change in macroeconomic and financial conditions. The distribution of debts and assets according to age of the household head indicates whether the household has a short or long horizon of planning and its profile of future income flows. Although a longer horizon implies higher levels income uncertainty, it also implies potentially increasing income profiles that would allow higher levels of indebtedness. The distribution of debts and assets according to employment vulnerability of the household head allows identifying over-indebtedness and default risks, being particularly useful for a financial stability assessment.

1. Data description and methodological issues

The most recent source of household financial data is the 2004 Social Protection Survey (EPS, for *Encuesta de Protección Social*), which includes for the first time a financial module in the 2004 wave. The survey was designed to assess the well being of workers and non-workers and their households. It accounts for 16,727 observations that represent the population of Chile aged 18 and more.

Although the EPS is not a financial survey, the financial module makes the dataset similar to those found in other countries.[9] In the EPS the number of questions about debts and assets is limited, particularly relating to financial service burden. What is common to other surveys is the availability of demographic and labor information, household composition, incomes, and stock of debts and assets.

All information in the survey about debt and assets is self-reported. This implies that there is a potential bias to under-report debt and some assets (e.g., saving accounts, stock holdings), and to over-value some assets (e.g., value of real estate). Information on mortgages could be more accurate than information of the value of a property. For example, individuals know much better how much they must pay monthly and how many periods left they have than how much is the current market value of the property. Also, information on potential rent could be more accurate to indicate the value of a property. Thus, estimating the value of the rent could be much easier than estimating the market value of the property. We use both measures complementarily.

An aggregate measure of household income is required to carry out a quintile analysis. Obtaining such a measure is not straightforward as there are a number of difficulties. There could be non-reporting of some types of income and also under-reporting of some other types of income. The methodology used to aggregate household income is similar to that used by the *Encuesta de Caracterización Económica Nacional* (CASEN), which is the main survey designed for social policy making in Chile.[10]

Mortgage debt is calculated using an average interest rate, the monthly payment and the number of residual periods. Other debts include bank credit cards, bank credit lines, credit from department stores, bank consumer loans, finance institution consumer loans, vehicle loans, social institution loans, loans for education, and loans from other loaners (non-formal). For the sake of exposure, mortgage debt will be identified henceforth as “secured debt” and other types of debt will be classified as “unsecured debt.” Debts are reported as “amount of debt,” so there is no direct information on financial service burden.

Assets are separated into real estate and non-real estate. Real estate assets are those corresponding to the value of the housing properties (primary and secondary properties) reported by the interviewee and other members of the household. Non-real estate assets are financial assets, cars, and other assets. Financial assets comprise saving accounts in banks and pension institutions, fixed term deposits, stocks and bonds, investment funds, and others. “Cars” corresponds to the value of all motor vehicles owned by the household as reported by the interviewee. Other assets are capital assets such as machinery, land, livestock, and others.[11]

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[9] See, for example, the Survey of Consumer Finances in the U.S., the Survey of Household Income and Wealth in Italy, and the Spanish Survey of Household Finances (EFF).

[10] The methodology in this study differs in two aspects from CASEN: It does not make any correction for non reporting and it does not make any correction for under-reporting. The latter is common to the National Institute of Statistics.

[11] See Barceló (2006) and Bover (2004) for a review of the methodologies used for collecting financial data in households surveys applied to the 2002 Spanish Survey of Household Finances. See also Barceló and Bover (2006) for an insight of the use of this sort of data.

2. Debt and assets distribution across income quintiles

Distribution of debt

More than half of the Chilean households report some sort of debt. While only 16% of households report secured debt, 50% of households report unsecured debt (see Table 1). This indicates that there is wide access to credit, specially unsecured debt associated to consumer loans. Unsecured debt is particularly relevant at least for two reasons: First, it implies higher risks for the lender because there is less or no collateral for the loan. Second, it is mainly backed by future expected incomes, allowing for consumption smoothing over transitory income or needs shocks, being more volatile as requirements and use of debt are more linked to income/need shocks. Unsecured debt also mirrors financial deepening levels, indicating how able is the financial market to identify risks associated with individuals and to avoid problems of information asymmetries.

Table 1

Distribution of debt by income quintiles

Percentage

	Quintiles					
	I	II	III	IV	V	Total
Total debt						
% of households with debt	45	50	57	63	66	56
Share of debt	5	8	12	18	57	100
Secured debt						
% of households with debt	10	12	17	17	25	16
Share of secure debt	4	8	10	17	61	100
Unsecured debt						
% of households with debt	40	44	50	56	58	50
Share of unsecured debt	8	9	15	19	49	100

Source: Authors' own calculations based on EPS2004/05.

Although access to credit seems to be quite spread among population, richer households tend to use more debt. In fact, the richest quintile has 25% of households with secured debt, while quintiles I and II (the poorest) have only 10% and 12% of households, respectively. Quintiles IV and V have also above average proportion of households with unsecured debt. More than 55% of households in these quintiles hold unsecured debt, ,while the percentage of households in quintiles I and II is between 40% and 44%.

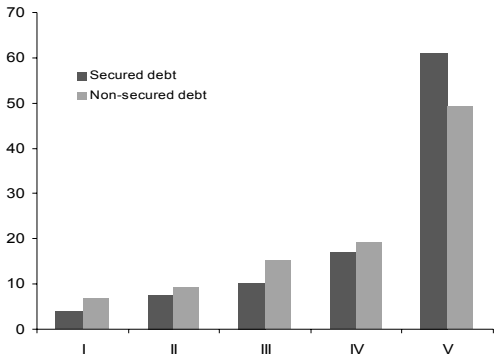
A large proportion of the debt corresponds to secured debt, indicating that the principal liability of households corresponds to housing. In fact, secured debt accounts for 64% of total debt, while unsecured debt accounts for 36%. This pattern is similar for all quintiles but quintile I, which has unsecured debt accounting for 52% of total debt.

Total debt is highly concentrated in the richest quintile, which holds 57% of the total amount of debt. In contrast, quintile I holds only 5% of total debt and quintiles III and IV have jointly 30% of total debt. Both secure and unsecured debt are mainly held by the richest quintile. Quintile V accounts for 61% of secured debt, while the poorest quintile holds a merely 3.9% of this debt. Also, the richest quintile has almost 50% of unsecured debt, and quintiles I and II jointly add up to no more than to 20% of unsecured debt (see Figure 6).

Figure 6

Distribution of debt

By total household income quintile as percentage



Source: Authors' own calculations using EPS 2004/05.

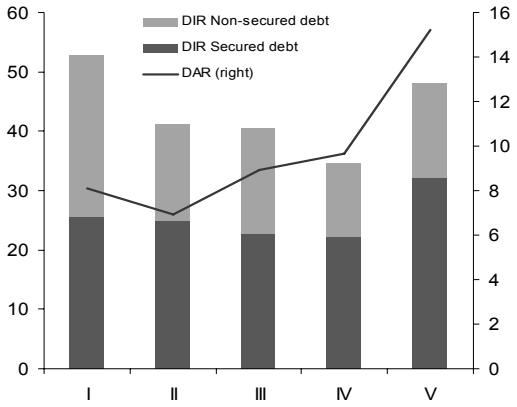
The concentration of secured debt in the richest households is highly correlated to the prices of properties they live in. Hence, low-income quintiles have a small amount of debt because they buy low-price properties. On the other hand, the concentration of unsecured debt is not particularly surprising because it follows the unequal distribution of income. Households request credit according to their income levels and are offered credit according to it.

The levels of household indebtedness are not particularly high when compared to income. Households who hold debt keep on average Debt to Income Ratio (DIR) of 43%. However, the median DIR is only 11%, indicating that half of all households have a particularly low DIR. The extreme quintiles have above average DIRs equal to 54% and 48%, respectively. Quintile IV looks like the least indebted one with a DIR of 38% (see Figure 7).

Figure 7

Debt to income ratio (DIR) and debt to asset ratio (DAR)

Percentage



Source: Authors' own calculations using EPS 2004/05.

Secure debt represents on average 26% of annual income. This is quite similar for all quintiles except for quintile V, which has a secured DIR of 32%. Unsecured debt is on average 18% of annual income. Only quintile I has above average levels, reaching 29%. Quintile IV is the least indebted one with DIR of 12%. Medians are quite low compared to

averages, indicating that there are some households with large ratios that bias upward the averages.

In sum, quintiles I and V appear to be the most indebted groups. While in aggregate terms quintile I is not particularly relevant since it holds a small share of debt, quintile V holds the majority of the debt. Nevertheless, only quintile I has a high debt to income ratio for unsecured debt.

Distribution of assets

More than 80% of households hold some sort of assets. The breakdown indicates that 77% of households in the poorest quintile report some asset holding, while more than 90% hold assets in the richest quintil (see Table 2). This is good news as assets can be used to back debts. Some of them could be liquefied in case of financial stress, implying less risk for the loan issuer. In fact, aggregate assets are 10 times aggregate debt.

Table 2

Distribution of assets by income quintiles

Percentage

	Quintiles					
	I	II	III	IV	V	Total
Total assets						
% of households with assets	77	82	83	87	92	84
Share of assets	10	13	14	20	43	100
Real estate assets						
% of households with assets	71	72	73	77	81	75
Share of real estate assets	11	13	15	21	40	100
Non-real estate assets						
% of households with assets	23	30	37	44	64	40
Share of non-real estate assets	7	7	9	15	61	100
Financial assets						
% of households with assets	14	18	20	22	31	21
Share of financial assets	4	5	5	12	73	100
Cars and other assets						
% of households with assets	11	15	22	29	52	26
Share of cars and other assets	7	8	10	16	58	100

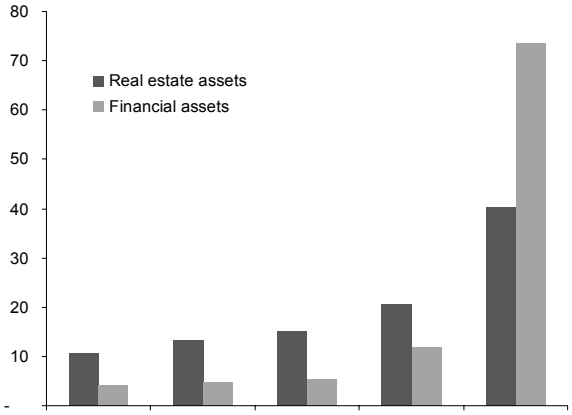
Source: Authors' own calculations based on EPS2004/05.

The assets are also concentrated in the richest households, but less dramatically than debt. In fact, quintile V holds 43% of total assets, while quintiles III and IV add up jointly 35% of total assets. Quintiles I and II hold only 10% and 13%, respectively (see Figure 8).

Figure 8

Distribution of assets

By total household income quintile as percentage



Source: Authors' own calculations using EPS 2004/05.

When assets are broken down into real estate assets and non-real estate assets (financial assets plus cars and other assets) it is observed that above 70% of households report real estate asset holding in all quintiles. The relevance of real estate assets is reflected in the fact that the share of total assets is 88% (see Table 2). Non-real estate assets are a minor part of total assets even for the richest quintile (18% share). Breaking down further into financial assets and cars and other assets shows that financial assets are less than 3% of total assets. Even households in quintile V have a low share of financial assets (4.4%). These results may be due mainly to the fact that this is not a financial survey and hence does not make a particular effort in collecting appropriately financial data.[12]

The concentration of non-real estate assets is much more pronounced than that of real estate assets. While quintile V holds 61% of non-real estate assets, quintiles III and IV add up jointly to only 25%. The distribution of financial assets is even more concentrated since quintile V concentrates 74% of total financial assets (quintiles I, II and III only hold 14% of total financial assets). Cars and other assets are also rather concentrated in the richest quintile, where quintile V holds 58% of total cars and other assets. Non-real estate assets, particularly financial assets, are easier to liquidate than real estate assets, making them easily available to payback debts under financial stress.

In sum, the distribution of assets is not as concentrated as that of debt because it is driven by real estate assets, which are distribute more evenly than debt.[13] This is reflected in the Lorenz curves, which show that debt distribution is more unequal than asset distribution and even more than income distribution (Figure 9). Two aspects must be underlined. First, the concentration of assets indicates an important backing to the concentration of debt, although a household-by-household analysis is required to determine household over indebtedness. Second, there is a low percentage of financial assets holding, that may be due to non-reporting problems in the survey.

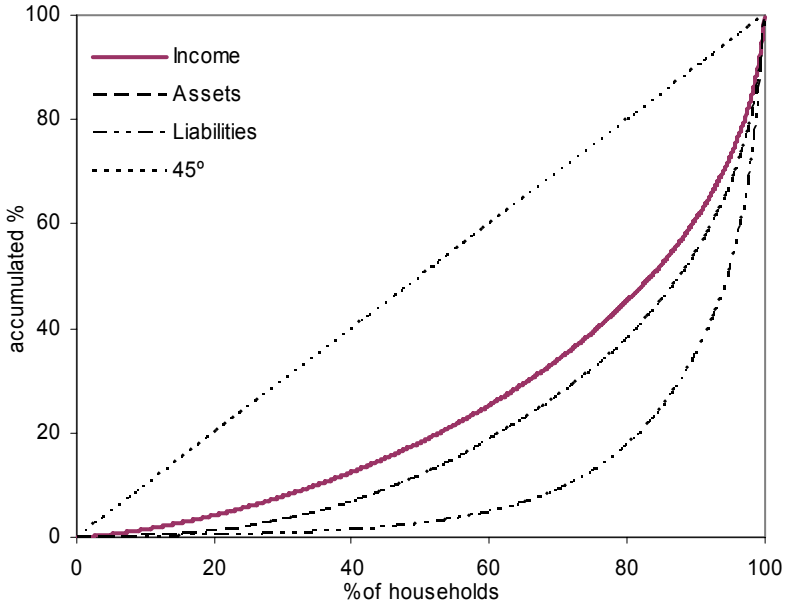
[12] "Proper financial surveys" even over sample richer households assuming they hold the majority of financial assets.

[13] The high rates observed could be explained by the various housing policies implemented by the Chilean government. In the case of Chile, the results of the 2003 Casen survey indicate that 43.3% of the households that own the home in which they live have benefited from one of the State housing programs.

Figure 9

Distribution of households' incomes, assets and liabilities

Lorenz curve; percentage



Source: Authors' own calculations using EPS 2004/05.

3. Debt and assets along the life-cycle

Along the life-cycle individuals have different income profiles and different spending requirements. In the context of the life-cycle, if individuals were able to borrow against their future income flows they would be borrowers at the beginning of the cycle, savers in the middle of the cycle, and dis-savers at end of the cycle. Hypothesis testing is beyond the scope of this article; nevertheless the life-cycle hypothesis is a useful framework. If future expected income is higher than current income, and if consumption desire is higher than current income, unconstrained individuals would be willing to borrow. This is the demand side. On the supply side, higher future expected income would increase repayment ability and hence more credit would be available for a younger individual. From a financial stability point of view, individuals with longer labor horizon would be able to sustain a larger burden and then would be more likely to honor their financial commitments.

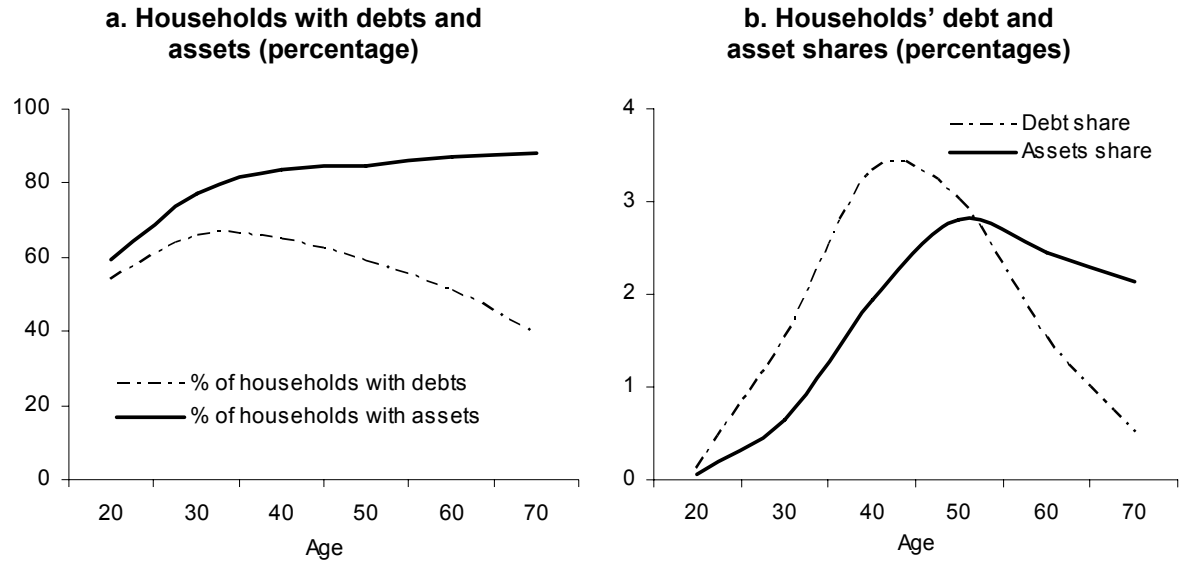
Distribution of debt

The distribution of debt among different age cohorts indicates that younger households are more likely to be running a debt. While 56% on average report to have some sort of debt, above 60% of households with head in young to middle age brackets (aged 25-34, 35-44, and 45-54) have debt (Figure 10 and Table A2). Youngest and elderly households have below average debt reporting (18-24 have 54% and 65+ have 39%).

Households aged 35-44 and 45-44 hold the vast majority of the debt (33% and 30% respectively). Very young and elderly households only add up to 6% of total debt. Secured debt reporting is concentrated in young and mature households (25-54 hold a share that adds up to 83%, Table A2). Unsecured debt shows a different pattern. There is an evenly distributed profile debt reporting (at least 37% for all age groups). The share of debt is concentrated in households aged 35-64 (they add up to 79% of unsecured debt).

Figure 10

Debt and assets by age

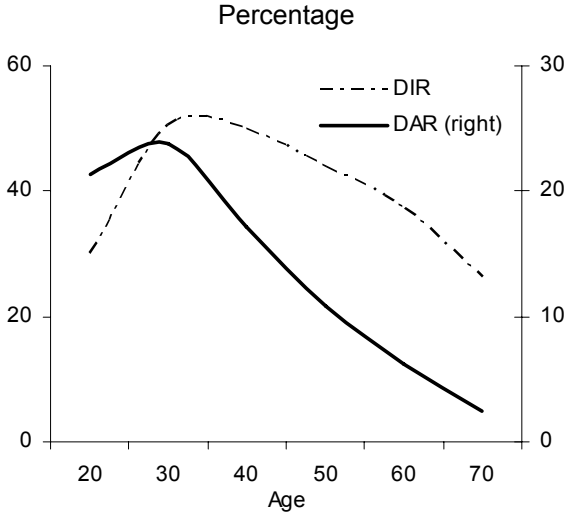


Source: Authors' own calculations using EPS 2004/05.

Debt over income ratios vary significantly over age cohorts (Figure 11). Young to middle age cohorts present the higher DIR (above 44%). Secure debt DIRs are much larger for those aged 25-34 and 35-44 (36% and 34% respectively, Table A3). This is consistent with relatively young households running large mortgage debts. Unsecured debt DIR, however, shows a flat pattern over age cohorts, where older cohorts tend to have slightly larger ratios. It is worth noting that those older households may have less secured debt over income ratio at the same time (fifth row in Table A3).

Figure 11

Debt to income ratio (DIR) and Debt to assets ratio (DAR) by age



Source: Authors' own calculations using EPS 2004/05.

Total debt to income ratios are similar to those obtained with aggregate data (see section II). None of the cohorts have particularly high levels of DIR. While high levels of secured debt to income ratio are concentrated in young to middle individuals, high levels of unsecured debt to income ratios are concentrated in mature individuals. Whether these results obey demand or supply effects is a question that goes beyond the scope of this paper.

Distribution of assets

Only very young cohorts have below average assets reporting. Asset value holding is highly concentrated in mature and elderly households, where 93% of assets are held by households aged 35 and over (see Figure 10). Real estate assets are mainly present for cohorts older than 35, where at least 70% have real estate assets (Table A4). On the contrary, non-real estate assets are reported evenly among households of all ages. However, young households (aged 18-34) have a share of only 7% of the value of non-real estate assets.

The pattern of non-real estate assets is fairly similar for financial assets and cars and other assets. There is a similar proportion of households in all age cohorts that report having financial assets (21% on average), although younger households tend to be more likely to have assets. Only 5% of households aged 18-24 have cars and other assets, but for those aged 25 and above, at least 20% of households report holding those assets. Financial assets are mainly concentrated in groups aged 35-55, presumably because of accumulation towards buying real estate (Table A4).

Then, the overall picture is that assets are held by all age groups, according to what is expected in the life-cycle. More importantly from financial stability perspective, assets are available to back debts in all age groups.

4. Debt, assets and employment vulnerability

As stated above, employment vulnerability is crucial to determine default risks and hence over-indebtedness. Households' income is mainly composed by labor income, therefore the importance to assess vulnerability by a dimension that covers labor income uncertainty. Three dimensions were chosen to break down households: employment status, education, and formal status of the job.

Consequently, households were classified according to the characteristics of the household head: the first break down was between workers and non-workers. Worker household heads were classified according to their education into secondary education (complete and incomplete), and tertiary education (university education, technicians and other professionals). In addition, all sub-groups were divided according to employment contract (with and without employment contract). Categories of workers are ordered according to what should be higher to lower employment vulnerability.

Distribution of debt

There is a high correlation between employment vulnerability and household' total per capita income, which implies that this breakdown is useful in many dimensions: Human capital, employment quality, and job market performance.

It is worth noticing that only 13% of household heads have tertiary education. Also, non-worker household heads, including pensioners, are 23%. Household heads workers with incomplete secondary education are 42% (see Figure 13). Then, debt shares must be considered according to population shares of the groups.

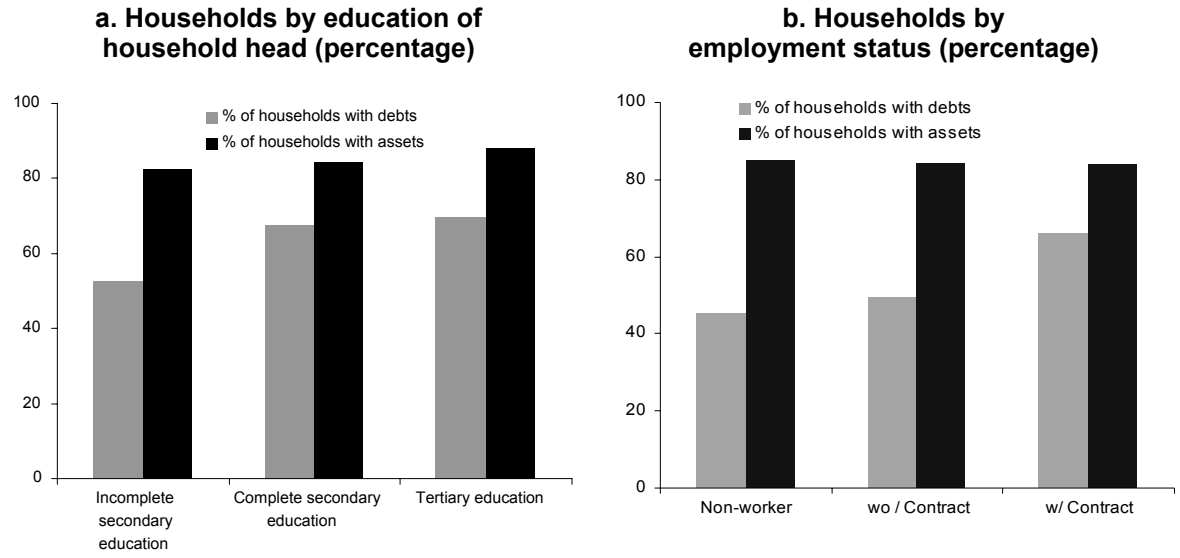
Noticeable, there is a large proportion of households with debts among those with higher education and/or employment contracts (above 60%), while the rest have below 45%. The

supply effect of access to credit market seems to be strong for employment contract as those workers with a formal job contract and complete secondary education or tertiary education exhibit the largest proportion of households with debt (71%, see Table A5).

The share of total debt held by households with tertiary education and employment contract is 33% (Figure 13), following the debt concentration reported in previous sections. Meanwhile, 20% of the debt is held by households with complete secondary education and job contract.

Figure 12

Debt and assets holding by employment vulnerability



Source: Authors' own calculations using EPS 2004/05.

The proportion of households with secure debt is lower for non-workers and incomplete secondary education without employment contract. Non-workers include pensioners who are more likely to own completely the property they live in, while incomplete secondary education workers are less likely to obtain a mortgage loan. Households with complete secondary education and with employment contract or with tertiary education hold jointly a share of 66% of secure debt (Table A5).

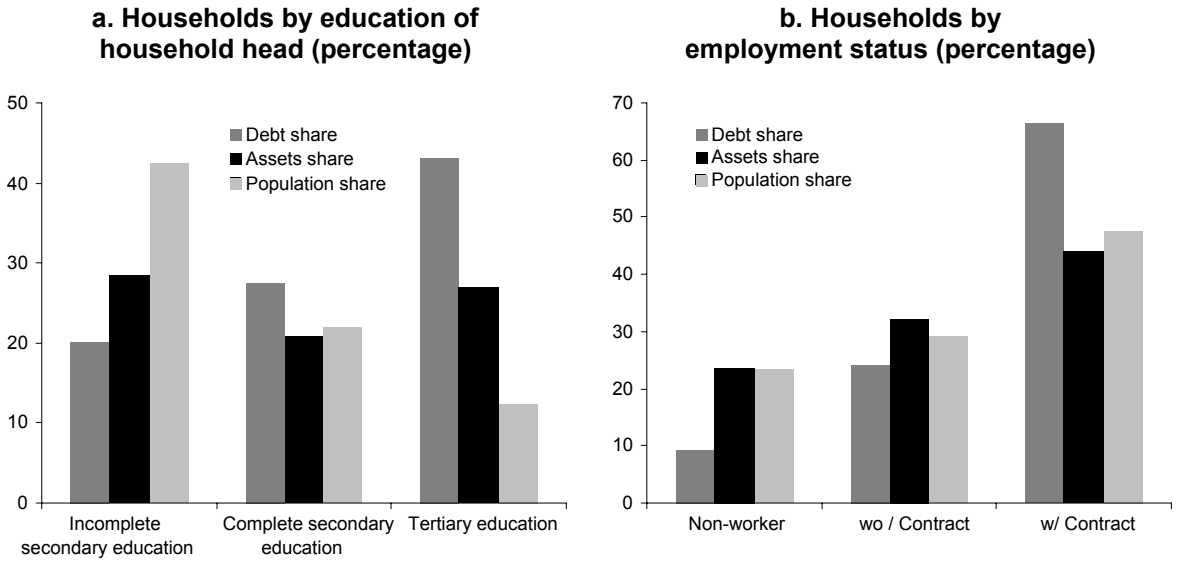
In parallel, the proportion of households with unsecured debt varies significantly among different groups. A share of 47% of unsecured debt is held by households with complete secondary education with contract or with tertiary education. However, non-workers hold 14% of unsecured debt and those with incomplete secondary education add up to 23% of unsecured debt.

Indebtedness also varies significantly among groups. While debt over income ratios is 31% for incomplete secondary education without employment contract, it is 66% for tertiary education with employment contract (see Figure 14 and Table A6). This indicates that households with less employment vulnerability are those with higher levels of indebtedness of any type. The picture of less employment vulnerable households holding larger levels of debt is repeated when breaking down into secured debt and unsecured debt.

Then, households with less employment vulnerability hold the major fraction of both secured and unsecured debt. This implies that there is no clear reason so far to consider that there is an important amount of debt "in the wrong hands".

Figure 13

Debt and assets shares by employment vulnerability



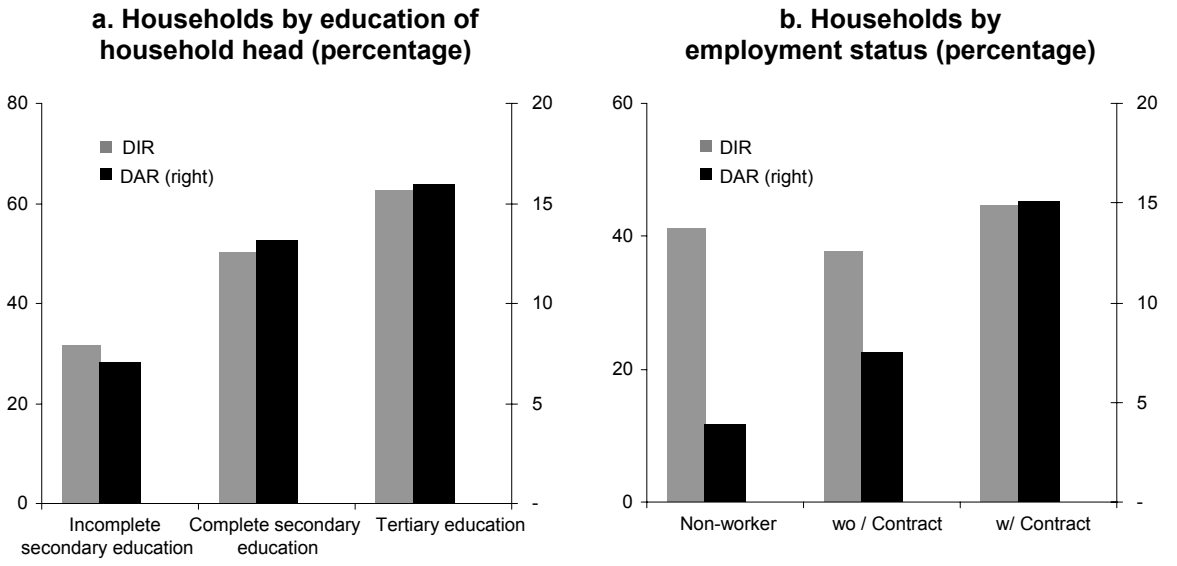
Source: Authors' own calculations using EPS 2004/05.

Distribution of assets

All groups have similar asset ownership proportion (between 82% and 91%, see Figure 12). In terms of the share of assets, it is much more equally distributed than debt, so that all groups share of total assets are according to their population shares.

Figure 14

Debt to income ratio and debt to assets ratio by employment vulnerability



Source: Authors' own calculations using EPS 2004/05.

Real estate assets are owned by more than 72% of households in all groups, exhibiting proportional real estate assets share (Table A7). A different situation is observed for non-real estate assets, where the proportion of households that have non-real estate assets varies from 30% for non-workers to 73% for tertiary educated with contract.

There is a large concentration of financial assets (43%) in households with tertiary education and employment contract. Also, those households with tertiary education without job contract, being only 3% of population, hold 17% of cars and other assets. This could be explained by self-employment linked to transport and micro and small enterprises.

IV. Households' net worth

Net worth determines whether assets held by the households cover their debts, and consequently, it allows assessing their financial strength. In normal times (without sudden price changes), mortgage debt is balanced by the value of the property. Debts associated with the purchase of cars, machinery and other vehicles may be guaranteed by the value of these assets. Therefore, negative net worth is generally originated by consumer debt that has limited or no guarantees. In this section, we measure the net worth of each household and characterize the households with negative worth in terms of income, age, and employment vulnerability of the household head.

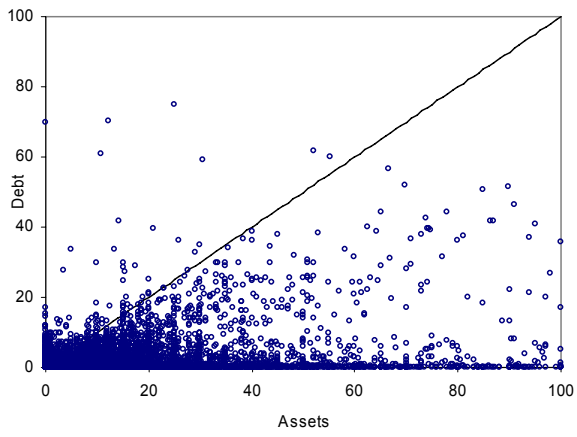
1. Net worth across quintiles

The vast majority of the households have positive net worth. This can be seen in Figure 12, where liabilities of each household are plotted against their assets. The figure shows that 80% of the households have more assets than liabilities (debt-asset combination lie below the 45° line). Observe also that 9% of households are gathered in the origin, indicating that they had no assets or liabilities. Only 11% of households have negative net. In other words, there is a low proportion of households that has not enough assets backing their debts, and therefore, are in a weak financial position. In most cases these households had comparatively little debt and little if any assets to draw upon, so these negative net worth households typically lie close to the origin of Figure 15.

Figure 15

Households' assets and debts

Millions of Chilean Pesos



Source: Authors' own calculations using EPS 2004/05.

Households with negative net worth hold 18% of total debt. However, as the majority of households in Chile own real estate, only 12% of the secured debt is in hands of households with negative wealth. Thus, these negative net worth households were almost exclusively renters whose unsecured debts (27% of total unsecured debt) exceeded the value of any financial assets they held.

The picture within quintiles is rather similar. At least 75% of households have positive net worth in all quintiles and no more than 12% of households have negative net worth in all quintiles (see Table 3). These results are due to three facts. First, total debt is only 10% of aggregate total assets (5% for quintile I and 13% for quintile V). Second, most of the debt is secured debt, which implies that the value of the property owned by the households acts as a guarantee. Third, a significant proportion of households hold non-real estate assets (cars for example).

Table 3

Distribution of net worth by quintiles

Percentage

	Quintiles					
	I	II	III	IV	V	Total
% of households						
Net worth > 0	75	77	79	84	88	80
Net worth = 0	13	11	9	7	5	9
Net worth < 0	12	12	12	9	8	11
Debt of households with NW < 0						
Share of debt						
Total debt	1	2	3	4	7	18
Secured debt	1	2	2	3	5	12
Unsecured debt	3	4	6	4	11	27
Debt over income ratio (DIR)						
Total debt	57	50	62	48	72	57
Secured debt	16	24	22	30	34	24
Unsecured debt	41	26	40	19	38	33

Source: Authors' own calculations based on EPS2004/05.

2. Net worth and the life-cycle

There are sizable differences in the proportion of households with negative net worth among different age groups. Young groups tend to be more likely to have negative net worth. More than 20% of those aged 18-34 and 13% of those aged 35-44 have negative net worth compared to an average of 9% (see Table 4). From a life-cycle perspective this was expected, since young households do not accumulate assets and try to smooth consumption over their lifespan. The good news comes from the fact that few mature or elderly households have negative net worth.

Households with negative net worth hold a small amount of total debt for all age groups. However, 27% of unsecured debt is held by households with negative net worth. Comparing the amount of the debts to their incomes, the most indebted households are the middle to

mature aged groups: those aged 35-44, 45-54 and 55-64, present DIR indexes of 54%, 82% and 52% respectively (see lower pane of Table 4).

Table 4

Distribution of net worth by age

Percentage

	Age groups						
	18-24	25-34	35-44	45-54	55-64	65+	Total
% of households in group	2	12	24	27	19	16	100
% of households							
Net worth > 0	53	68	79	81	85	87	80
Net worth = 0	22	12	8	9	8	8	9
Net worth < 0	25	20	13	10	7	5	11
Debt of households with NW < 0							
Share of debt							
Total debt	1	3	6	6	2	1	18
Secured debt	0	2	4	4	1	0	12
Unsecured debt	1	4	9	8	3	2	27
Debt over income ratio (DIR)							
Total debt	38	43	54	85	52	33	57
Secured debt	15	21	25	37	15	5	24
Unsecured debt	23	22	29	48	37	29	33

Source: Authors' own calculations based on EPS2004/05.

3. Net worth and employment vulnerability

The households who have above average negative net worth are relatively less vulnerable. We observe that 13% of households whose household head has incomplete secondary education with employment contract have negative net worth. Also, 15% of households with complete secondary education with employment contract and 13% of households with tertiary education with employment contract have negative net worth (see Table 5). Those groups with negative net worth that hold the largest share of debt are those with relatively less employment vulnerability, namely complete secondary education with and without employment contract, end tertiary education with and without employment contract.

The DIR of those households with negative net worth is only above average for three groups: Those with complete secondary education without employment contract, 61%, and with employment contract, 59%, and those with tertiary education with employment contract 117%. The latter group is the one that causes concern in terms of indebtedness. However, almost half of their debt corresponds to secured debt.

V. Debt service and vulnerability

Debt service payment is a key element of households' financial vulnerability analysis. Although the amount of debt determines the level of indebtedness of the households, it is the debt service payment what eventually may induce a household to default its financial

obligations. Certainly, it is the ratio of debt servicing cost over income what determines the ability of the household to fulfil its commitments.

Aggregate measures of debt service over income are used in financial stability analysis, although micro data indicators have replaced them progressively. In this section we first explain the estimation procedure of debt service burden and then we analyse household vulnerability from a financial stress point of view.

Table 5

Distribution of net worth by employment vulnerability

Percentage

	Age groups							
	Non-worker	Secondary Education				Tertiary Education		Total
		Incomplete		Complete		wo/contract	w/contract	
		wo/contract	w/contract	wo/contract	w/contract			
%of Households in group	23	20	23	7	15	3	10	100
% of Households								
Net worth > 0	83	80	78	82	77	89	81	80
Net worth = 0	9	12	9	8	7	5	7	9
Net worth < 0	8	8	13	10	15	6	13	11
Debt of Households with NW < 0								
Share of Debt								
Total Debt	2	1	2	1	4	0	7	18
Secured Debt	1	1	1	1	3	0	5	12
Unsecured Debt	4	1	4	1	6	1	10	27
Debt over income ratio (DIR)								
Total Debt	52	38	39	59	61	57	117	57
Secured Debt	15	20	13	32	31	0	55	24
Unsecured Debt	37	18	27	27	31	57	62	33

Source: Authors' own calculations based on EPS2004/05.

1. Estimating debt service burden

The data required to compute accurately debt service is rarely available, even with financial surveys. Consequently, a series of assumptions must be made in order to obtain estimations of debt service. In our case, information on debt service burden is more accurate for mortgages, and less reliable for other types of debt. In fact, we have to make assumptions on the residual number of periods for each type of debt and on the interest rates effectively charged to each individual for each type of debt. Thus, we use average residual periods and average interest rates for each type of debt obtained from aggregate data. However, using average residual periods could overestimate actual residual periods for households that are ending the repayment of their loans, while it could underestimate actual residual periods for households that are just starting to repay their loans. We assessed this problem by computing residual periods for each household assuming a uniform distribution of type of debt within each of twenty equally large income groups.

With nominal interest rates and residual periods for each type of debt in hand, the estimation of debt service for each type of debt *d* is simply:

$$ds_d = \frac{d_d}{\sum_{k=0}^{rp_d} \frac{1}{(1+r_d)^k}},$$

where ds_d is the monthly debt service payment, d_d is the total amount of debt d, r_d is the interest rate associated with debt d, and rp_d is the residual period corresponding debt type *d* for each household.

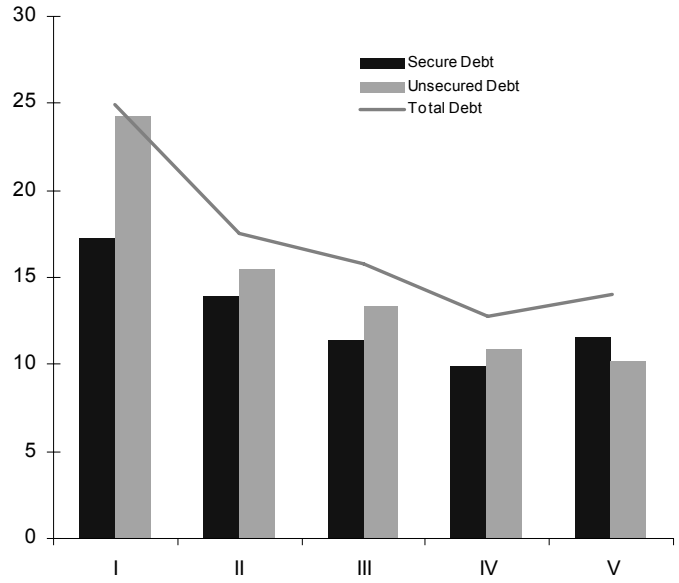
2. Households under financial stress

Our estimates show that the median debt service to income ratio (DSR) is 16% considering all indebted households.[14,15] The richest households (IV and V) register DSRs lower than the overall median (13% and 14% respectively); while low income households (quintiles I and II) present DSRs between 25% and 18% (Figure 16). Given that there is a large concentration of debt in the richest quintiles, in particular in quintile V, a lower DSR for those households represents good news for the financial vulnerability assessment.

Figure 16

Debt service to income ratio (DSR)

By total household income quintiles, households with debt, median as percentage[1]



[1] Median secured debt DSR is computed only for those households who hold secured debt. Unsecured debt is computed similarly.

Source: Authors' own calculations using EPS 2004/05.

A deeper analysis of financial burden and households' vulnerability implies reviewing levels of DSR and corresponding debt shares. Table 6 presents different DSR percentiles and their associated debt shares. Three quarters of the households exhibit DSR lower than 31%. One in ten households presents DSR above 57%. This group might be considered as highly vulnerable. Notwithstanding this group holds only 13% of secured debt, they hold a large share of unsecured debt that reaches 40%.

[14] This figure compares to 14% in the US, while three quarters of households in the UK have DSR below 25%, and Spain has a median DSR of 18% considering only mortgages.

[15] Table A8 contains interest rates and terms used to estimate debt service.

In the case that these households are not able to fulfil they financial obligations, they may liquidate their assets, hence the relevance of their net worth situation. Table 13 indicates that households with DSR above 50% and negative net worth are only 4% of debtor households. Moreover, these households hold 9% of total debt, and consequently they do not represent a systemic menace to financial stability.

Table 6

Estimated debt service to income ratio (DSR)

Percentage

Percentiles	Upper DSR	Share of secured debt	Share of unsecured debt	Share of total debt
0-50	16	27	16	23
50-75	31	32	18	27
75-90	57	29	26	28
90-99	90	13	40	21

Source: Authors' own calculations based on EPS2004/05.

Table 7

Net wealth of households with debt service to income ratio (DSR) > 80

Percentage

Net wealth	Share of households	Share of secured debt	Share of unsecured debt	Share of total debt
NW > 0	8.2	10	28	16
NW < 0	3.8	6	17	9
Total	12.1	15	45	25

Source: Authors' own calculations based on EPS2004/05.

Vulnerability is also implied by the sensitivity to DSR to shocks. Households may be at risk of default if they suffer from negative income and interest rate shocks. The former is particularly important in the vulnerability assessment of Chilean households because of the lack of a strong social protection of workers. The latter is less relevant since the vast majority of loans is subscribed at fixed rates (or bounded variable rates). This analysis requires a deeper knowledge of unemployment and its duration, which goes beyond the scope of this paper, so it will be addressed in future research.

VI. Concluding remarks

The analysis based on individual household is essential to assess the degree of indebtedness and consequently vulnerability of the household sector before negative

changes in macroeconomic and financial conditions. This paper helps to discover the possible financial weaknesses of the household sector. The analysis, for the first time in Chile, studies the distribution of debts and assets, relating them to households' characteristics such as income, age, education, and employment vulnerability.

The analysis of the survey shows that households with higher income also concentrate a large proportion of debts and assets. These richest households are young adults with higher education and with employment contracts. This indicates that the debts are mainly concentrated in hands of households with high current income and high expected future income.

The most financially vulnerable households - with negative net worth and debt service burden relatively high - represent only 4% of total households and hold 9% of total debt. This evidence suggests that the majority of Chilean households enjoy enough financial strength to service their debts. Only a small proportion of the household sector has high levels of indebtedness and negative net worth, and hence, they are financially vulnerable. However, the exposed amount of debt is negligible. Thus, the household sector does not represent a source of systemic risk for the financial system.

Appendix

As stated in section III, an aggregate measure of household income is required to carry out an analysis based on income quintiles. Obtaining aggregate income within the household is not straightforward as there are a number of difficulties. In spite of adding up all types of income from all household members, two main problems are common to household surveys and may or may not be addressed: there could be non-reporting of some types of income and also under-reporting of some other types of income. The methodology used to aggregate household income is similar to that used by the *Encuesta de Caracterización Económica Nacional* (CASEN), which is the main survey designed for policy making in Chile, and carried out by the Ministry of Planning. The method consists in adding up all monetary incomes from household members, plus monetary subsidies, plus imputed rent. However, the methodology used in this paper differs in two-aspects from CASEN. First, it does not make any correction for non-reporting; and second, it does not make any correction for under-reporting. The former might be addressed in a future version of this work. The latter is the most controversial point in data correction in CASEN, to an extent that the *Instituto Nacional de Estadísticas* (INE, National Institute of Statistics) has abandoned that scheme.

After adding up all earnings from all household members a measure of aggregate income or total income is obtained. However, there is a proportion of households that reports total income equal to zero. This may be the result of households' members non-reporting their incomes. In order to avoid problems of miss-representation of the income distribution, only households with total income larger than zero where considered. Nevertheless, the overall distribution of income obtained matches the distribution obtained by CASEN 2003.

Table A1

Debt to income ratio (DIR)

By income quintiles, percentage

	Quintiles					
	I	II	III	IV	V	Total
Total Debt						
Mean	54	41	40	35	48	43
Median	13	8	9	8	19	11
Secured Debt						
Mean	26	25	23	22	32	26
Median	0	0	0	0	0	0
Unsecured Debt						
Mean	29	16	18	12	16	18
Median	7	4	4	3	4	4

Source: Authors' own calculations based on EPS2004/05.

Table A2

Distribution of debt by age

Percentage

	Age groups						
	18-24	25-34	35-44	45-54	55-64	65+	Total
%of Households	2	12	24	27	19	16	100
Total Debt							
% of Households with debt	54	66	65	59	51	39	56
Share of debt	1	15	33	30	15	5	100
Secured Debt							
% of Households with debt	9	20	24	19	11	3	16
Share of Secure Debt	1	18	36	30	13	3	100
Unsecured Debt							
% of Households with debt	50	60	55	51	46	37	50
Share of Unsecured debt	1	10	29	31	20	9	100

Source: Authors' own calculations based on EPS2004/05.

Table A3

Debt to income ratio (DIR)

By age, percentage

	Age groups						
	18-24	25-34	35-44	45-54	55-64	65+	Total
Total Debt							
Mean	30	51	50	44	37	26	43
Median	10	14	16	10	8	7	11
Secured Debt							
Mean	15	36	34	25	18	9	26
Median	0	0	0	0	0	0	0
Unsecured Debt							
Mean	15	15	16	19	19	17	18
Median	7	5	4	3	4	5	4

Source: Authors' own calculations based on EPS2004/05.

Table A4

Distribution of assets by age

Percentage

	Age groups						
	18-24	25-34	35-44	45-54	55-64	65+	Total
%of Households	2	12	24	27	19	16	100
Total Assets							
% of Households with Assets	60	77	84	85	87	88	84
Share of Assets	0	6	19	28	24	21	100
Real Estate Assets							
% of Households with Assets	40	54	72	78	82	84	75
Share of Real Estate Assets	0	6	19	28	24	22	100
Non-Real Estate Assets							
% of Households with Assets	31	49	42	38	39	32	40
Share of Non-Real Estate Assets	0	7	26	26	27	14	100
Financial Assets							
% of Households with Assets	29	32	22	19	19	16	21
Share of Financial Assets	0	9	29	27	21	15	100
Cars and Other Assets							
% of Households with Assets	5	26	28	27	27	20	26
Share of Cars and Other Assets	0	7	25	26	28	14	100

Source: Authors' own calculations based on EPS2004/05.

Table A5

Distribution of debt by employment vulnerability

Percentage

	Age groups							
	Non-worker	Secondary Education				Tertiary Education		Total
		Incomplete		Complete		wo/contract	w/contract	
		wo/contract	w/contract	wo/contract	w/contract			
%of Households	23	20	23	7	15	3	10	100
Total Debt								
% of Households with debt	45	44	61	60	71	65	71	56
Share of debt	9	7	13	8	20	9	34	100
Secured Debt								
% of Households with debt	7	11	16	22	25	21	28	16
Share of Secure Debt	7	7	12	8	20	9	37	100
Unsecured Debt								
% of Households with debt	42	37	54	49	62	55	64	50
Share of Unsecured debt	14	8	15	7	20	9	27	100

Source: Authors' own calculations based on EPS2004/05.

Table A6

Debt to income ratio (DIR)

By employment vulnerability, percentage

	Age groups							
	Non-worker	Secondary Education				Tertiary Education		Total
		Incomplete		Complete		wo/contract	w/contract	
		wo/contract	w/contract	wo/contract	w/contract			
Total Debt								
Mean	41	31	32	52	50	51	66	43
Median	7	9	9	15	16	17	24	11
Secured Debt								
Mean	18	18	18	36	32	30	44	26
Median	0	0	0	0	0	0	0	0
Unsecured Debt								
Mean	23	13	14	15	18	21	22	18
Median	5	4	4	3	5	6	5	4

Source: Authors' own calculations based on EPS2004/05.

Table A7

Distribution of assets by employment vulnerability

Percentage

	Age groups							
	Non-worker	Secondary Education				Tertiary Education		Total
		Incomplete		Complete		wo/contract	w/contract	
		wo/contract	w/contract	wo/contract	w/contract			
%of Households	23	20	23	7	15	3	10	100
Total Assets								
% of Households with Assets	85	83	82	86	84	91	87	84
Share of Assets	24	15	14	8	13	9	18	100
Real Estate Assets								
% of Households with Assets	80	74	74	74	72	77	72	75
Share of Real Estate Assets	25	14	14	8	13	8	17	100
Non-Real Estate Assets								
% of Households with Assets	30	37	32	50	43	73	64	40
Share of Non-Real Estate Assets	13	19	8	9	10	15	26	100
Financial Assets								
% of Households with Assets	17	17	21	20	24	29	33	21
Share of Financial Assets	16	7	9	7	9	9	43	100
Cars and Other Assets								
% of Households with Assets	17	26	16	38	27	63	51	26
Share of Cars and Other Assets	13	22	8	10	10	17	21	100

Source: Authors' own calculations based on EPS2004/05.

Table A8

Interest rates and residual periods

Nominal interest rates and average residual periods,
November 2004 to February 2005

Type of debt in EPS	Anual interest rate (December 2004)	Residual period (in months)
Bank credit cards	34%	6
Bank overdrafts	19%	3
Department stores loans (less than 90 days) *	37%	1.5
Department stores loans (90 days to 1 year) *	37%	7.6
Department stores loans (less than 90 days) *	37%	18
Bank consumption loans (less than 1 year) **	34%	6
Bank consumption loans (more than 1 year) **	16%	42
Finance company consumption loans	37%	6
Motorvehicle loans	33%	52.8
Social credit	16%	48
Educational loans	5%	96
Relative or friends loans	0%	6
Shark loans	75%	6
Other debts	75%	6

(*) Department stores are 62% less than 90 days, 27% between 90 days and 1 year, and 11% more than 1 year.

(**) Bank consumption loans are 19% less than 1 year and 81% more than 1 year.

Source: Central Bank of Chile and SBIF.

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Session 5B

Distributional aspects of household finances

Chair: Mattias Persson
Sveriges Riksbank

Papers: Trends in the borrowing pattern of French households
Emmanuel Gervais, Bank of France

Measuring German household debt: financial accounts data and disaggregated survey data as complementary statistics
Nikolaus Bartzsch and Elmar Stöss, Deutsche Bundesbank

Swedish households' indebtedness and ability to pay: a household level study
Martin W Johansson and Mattias Persson, Sveriges Riksbank

Are there significant disparities in debt burden across Canadian households? An examination of the distribution of the debt service ratio using micro-data
Umar Faruqui, Bank of Canada

Income structure and income distribution of China
Shi Dong, People's Bank of China

Trends in the borrowing pattern of French households

Emmanuel Gervais[1]

A great deal of attention has been paid to trends in French households' financial behaviour as the sector has been the main contributor to the bank retail market growth over the recent years. It appears that loan-by-loan data are very useful in order to assess the sustainability of the recent increase in household debt while macro-economic statistics provide more conflicting evidence on the soundness of household financial position.

1. Strong dynamics in French household debt

As in other OECD member countries, French household debt has steeply increased in recent years. As a result, the ratio of the household debt to the GDP, as measured in financial accounts, has steadily risen since 1998 from 33.5% to 43.2% at the end of 2005 and to 44.7% by mid 2006. During the same period, non financial corporation debts remained stable and accounted for 55% of the GDP by the end of 2005.

This development in household debt mainly reflects the rise in the growth rates of loans granted by credit institutions. According to monetary statistics, they rose from 1.8% in 1994 to 11.7% in 2005. While consumer loans post lower and more volatile growth rates, housing loans have been the main contributor to the acceleration of loans to households. Excepting the plateau reached between 2000 and 2002, the housing loans contributions kept on increasing over the whole period.

As from the beginning of 2006, housing loan growth rate seems to level off at around 15%. The quarterly bank lending survey conducted by the Banque de France confirms that the demand for loans has tended to strengthen somewhat during the year while stabilization was expected at the end of the period[2].

In real terms, the current growth rate of housing loans is well above the average value observed between 1970 and nowadays and is only comparable to the peak reached during the seventies (Wilhelm, 2005[3]). However, the current boom is without precedence for two reasons:

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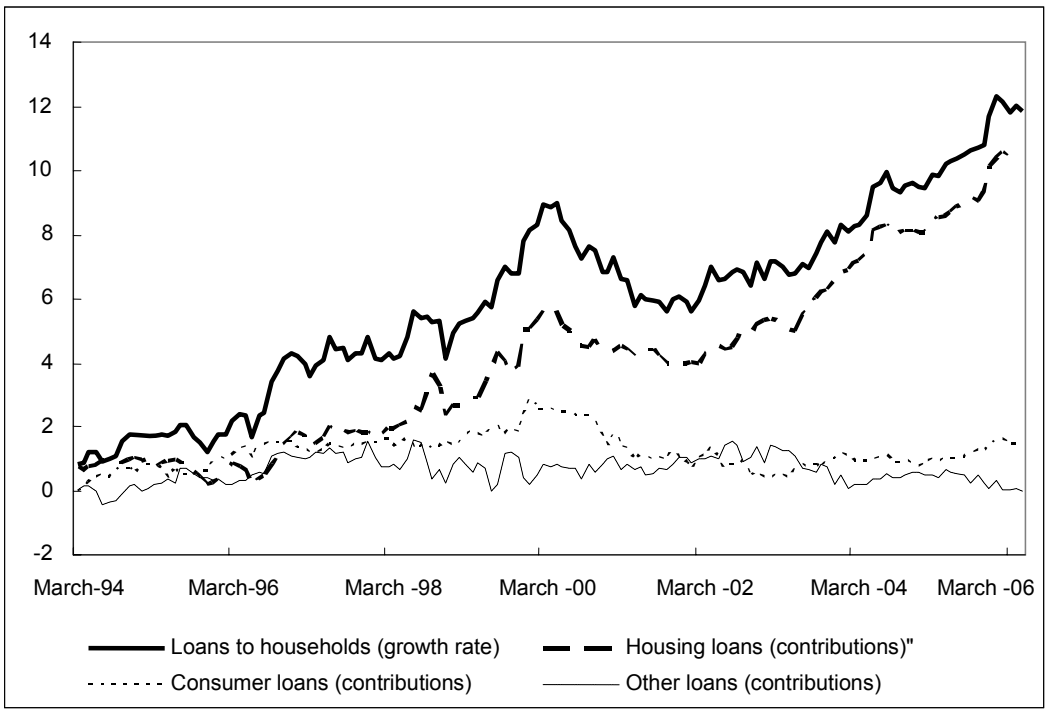
[1] Banque de France, Monetary and Banking Statistics Division. For further information on this paper, please contact: Emmanuel Gervais (emmanuel.gervais@banque-france.fr). The views expressed in this paper are those of the author and do not necessarily reflect those of the Banque de France.

[2] The bank lending survey is a quarterly survey conducted by national central banks of the Eurosystem. The main objective of the survey is to enhance the Eurosystem's knowledge of financing conditions in the euro area and hence to help the Governing Council of the ECB to assess monetary and economic developments as an input into monetary policy decisions. It is designed to complement existing statistics on retail bank interest rates and credit with information on supply and demand conditions in the euro area credit markets and the lending policies of euro area banks. The survey addresses issues such as credit standards for approving loans as well as credit terms and conditions applied to enterprises and households. It also asks for an assessment of the conditions affecting credit demand. See http http://www.ecb.int/stats/money/lend/html/index.en.html#results for the results at the euro area level and http://www.banque-france.fr/fr/stat_conjoncture/stat_mone/page6b.htm for the French results.

[3] See http://www.banque-france.fr/fr/publications/telechar/bulletin/etu140_2.pdf.

Loans by purpose: contributions to the total annual growth rate



Source and calculation: Banque de France's money and banking statistics.

- Its duration and its resilience to the economic slowdown which has taken place as from 2000[4].
- Its relative disconnection with gross fixed capital formation in dwellings as nearly two thirds of new loans are dedicated to transactions on existing real assets. In 2005, they accounted for 63.2% of the volume of new loans while loans dedicated to new houses accounted for 29.8% of the total and loans to house improvement 6.7% (Banque de France, 2006)[5]. This reflects the quite slow adjustment of the supply of housing to the rise in the demand, which itself explains the rise in construction prices noticed as from 2002.

The demand for housing has indeed been fuelled by the continuing increase in the number of households in connection with the growing population and the increase in the number of families. Besides, French households take into account the relative high opportunity cost of renting instead of buying, in particular because French legislation allows rent to be indexed on the construction prices [6]. They also generally feel that investment in housing is both profitable and secured specially with the view to preparing for retirement.

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[4] The annual growth rate of GDP went from 4.0 % in 2000 to 1.9 % in 2001, 1.0 % in 2002, 1.1 % in 2003, 2.3 % in 2004 and 1.2 % in 2005.

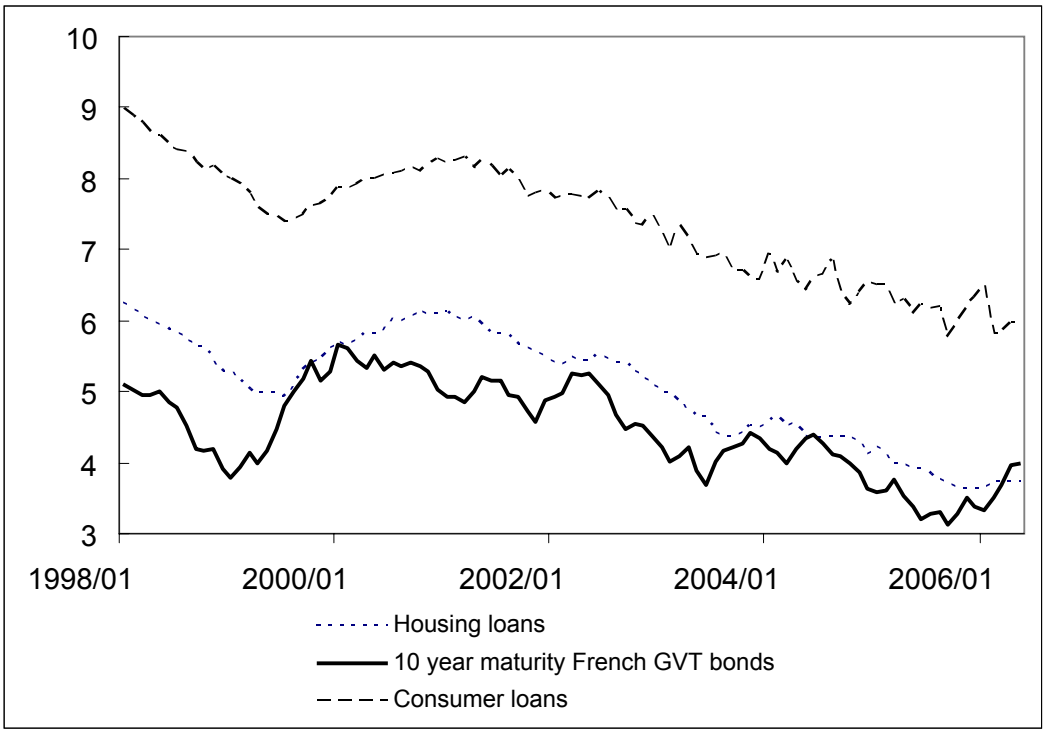
[5] See http://www.banque-france.fr/fr/publications/telechar/bulletin/etu150_5.pdf.

[6] In order to curb the inflation on rents due to this indexation, the reference to construction prices was repealed at the beginning of 2006 and replaced by a specific composite index in which the consumer price index weight amounts to 60 % (see http://www.insee.fr/fr/indicateur/indic_conj/donnees/method_idconj_35.pdf).

At the same time, banks seem to have been quite proactive in the financing of the housing transactions. Indeed, risks related to them are very low and will soon be reflected in the related prudential own funds requirements after the implementation of the new Basel II solvency regime. At the same time, granting housing loans might be a way of stabilizing or even locking in the relationship with the retail customers and bundling with the financing of other financial products.

However, the key factor at the origin of the current boom in housing loans has certainly been the decline in lending rates as from the end of the nineties. For instance, interest rates on loans with an over 10 year initial period fixation went down from 5.3% at the end of 1998 to 3.6%. Strong competition between lenders narrows the spread with market rates and in some period households were able to borrow at conditions similar to those obtained by the French Treasury (see graph below). Since the end of 2005, lending rates have clearly lagged rising long-term market rates: between September 2005 and September 2006 yields on 10 year maturity French government bonds increased from 3.13% to 3.77% while the interest rates on fixed term housing loans gradually increased from 3.59% to 3.91%.

Interest rates on new loans to households



Source and calculation: Banque de France's statistics on monetary interest rates (MIR).

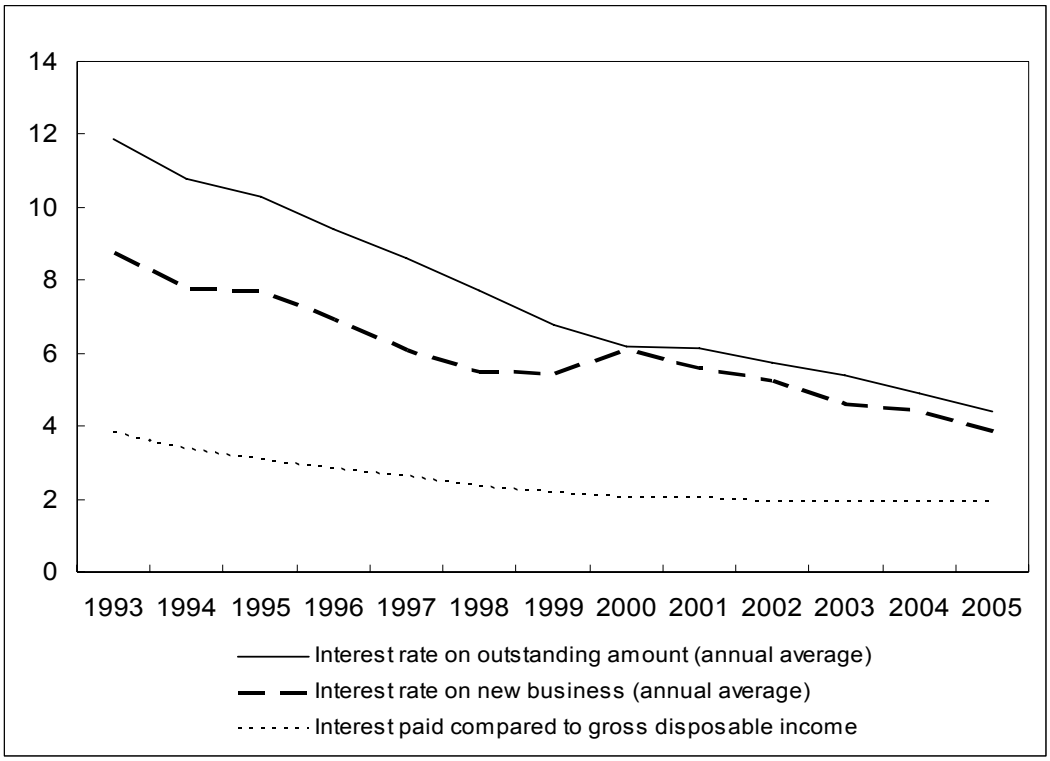
2. Unclear macro-economic evidence on household financial position

Such a continuous inflow of debts leads to the questioning of the soundness of the household financial position at the current juncture. In this regard, indicators using GDP as scaling factor could be misleading as they provide no indication regarding the weight of debt servicing on households' income, both in principal and interest. This remark seems to be highly relevant in the French case as the duration of new housing loans has markedly increased over the last years (see below).

A first answer can be provided looking at the impact of the payment of interests on household disposable income. According to the new interest rates statistics on outstanding amount, the annual average of implicit interest rates on housing loans (ie. the ratio of flows of interests as recorded in credit institutions' income statements divided by the average stock) dwindled between 1993 and 1999 from 11.8% to 6.7%. Since then, it has been slowly decreasing before reaching 4.4% in 2005.

As shown by the narrowing of the margin between interest rates on new business and interest rates on outstanding amounts, this development partly reflects substantial adjustments on the conditions on existing loans. Indeed, while the bulk of them are on fixed term, the French national legislation allows early repayments and caps the fees which can be charged by the lenders in the case of early redemption [7]. For housing loans, for instance, these fees cannot exceed 3% of the remaining principal and are forbidden for consumer credit with an initial amount less than 21500 euros[8].

Interest rates and interest paid by households



Source: Banque de France's MIR statistics.

As can be seen from the chart above, the flow of interest paid by households compared to their gross disposable income has thus decreased during the same period (considering only housing loans, it amounted to 3.80% in 1993, 2.16% in 1999 and 1.93% in 2005) and amounted to 3.0% of gross disposable income in 2005. The question could then be why

[7] At the end of 2005, the share of fixed term loans granted by credit institutions to households amounted to 78.5% and to 81.2% regarding housing loans.

[8] Articles L311-29 and D311 of the "Code de la consommation" regarding consumer credit and articles L312-21 and R312-2 see the French government official site: http://www.legifrance.gouv.fr.

households have not borrowed more. One answer could be that, referring to the life cycle hypothesis, pessimistic expectations on their future income or the ageing of the population has dampened the demand for loans[9].

Moreover, the strong dynamics in French household debt should be seen in its European context (see the report of the CCSF, 2004 [10]). Indeed, the growth rate of its banking component just equals the European average while Spain has constantly posted substantially higher growth rates over the last years (for instance, it grew by 12.0% in September 2005 on an annual basis in France and by 22.3% in Spain at the same date). A debt survey carried out on a panel of households by the "Observatoire de l'endettement des ménages" on behalf of the French Banks professional association confirms that the share of indebted households has not significantly changed since 1989 in France [11].

Share of indebted households
(annual survey based on a panel of households - in percentage)

Source: Observatoire de l'endettement des ménages 18ième rapport mars 2006.

The restrictive impact of the French legislation on usury rates on the supply of loans, exacerbated in the context of low market rates, is often suggested to explain the small of use of debts by a large part of the population, as it makes banks unable to charge higher risk

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9 The share of people aged between 30 and 49 in the working population declined from 58.3 in 1995 to 55.4 % in 2005 while the one of people aged between 50 and 64 expanded from 15.4 to 20.8 (see 2006 Claude Minni "Structure et évolution de la population active selon l'âge" http://www.insee.fr/fr/ffc/docs_ffc/DONSOC06b.PDF.

10 See http://www.banque-france.fr/fr/publications/telechar/bulletin/etu144_2.pdf.

11 See:http://www.fbf.fr/web/internet/content_particuliers.nsf/(WebPageList)/AEF1720671229E11C1256EAD0031D9DF.

premium[12]. Indeed, usury rates are defined by law as 4/3 of the (simple) average interest rates compiled each quarter by the Banque de France on the basis of data collected from banks. However, different usury rates are calculated depending on the purpose and the amount of loans in order to take into account the difference in terms of risks between the different types of banking loans, in particular between housing loans and consumer credit. All in all, six different categories are in use. Besides, leasing is not covered by usury legislation.

3. What can be learnt from loan-by-loan data?

The quarterly loan-by-loan reporting on new business (QLBLR) was introduced by the Banque de France in 1985 in the wake of the deregulation of the financing of the economy. The idea was to have some insights into the changes in market lending rates by collecting individual information from a limited sample of branches and specialized credit institutions. It has been used for the calculation of usury rates since 1990. As from the beginning of 2003 and for checking purposes, the QLBLR was also made fully consistent with the new harmonised Eurosystem statistics on interest rates (hereafter called MIR statistics). Consequently, the same sample and the same definition of new business is applied, except in the case of overdrafts, which are defined as authorizations in the QLBLR and as utilization in MIR statistics.

As a result, the coverage of the QLBLR has been markedly expanded to meet the objective of accuracy of 10 basis points on average. The reference period is now the whole first month of each quarter, instead of the first two weeks, while the size of the sample has been significantly increased: in particular 3700 branches are now included, instead of 500 branches prior to 2003. For each loan covered by the QLBLR, banks are required to collect a number of variables such as, inter alia, the interest rate, the annual percentage rate of charge (APRC), the amount, the duration of the loan and the annual income of the borrower, as known by the lender[13].

The interesting point about loan-by-loan data is that they allow the estimation of the distribution of interest rates at the level of the individual contracts and hence the extent of the truncation caused by usury rates. Lacroix (2005, internal) shows, by adjusting the observed cluster of interest rates to a combination of normal curves, that the impact of the legislation is marginal regarding housing loans but more effective regarding consumer credit of small amounts and personal loans.

The QLBLR also helps understand how the longer maturity of new housing loans has contributed to defuse the impact of buoyant housing prices on the service of household debts. Our findings are the following:

1. The average value of individual new loans grew in 2004 and 2005 at a pace similar to the one of housing prices. The latter increased by 25% during the period, according to an index based on indexes on construction prices and existing building prices weighted by the respective share of this two purposes in the new housing loans (respectively one third and two thirds, see section 1 of this paper). At the same time, the average value of “large” loans grew by 22.2% between January 2004 and January 2006[14]. Such a rise was also shown in the old QLBLR reporting, at

[12] See BABEAU 2005 http://www.banque-france.fr/ccsf/fr/publications/autres/menages_cred_consom.htm.

[13] Detailed information regarding the methodology of the MIR statistics and the sampling is available on the BDF’s web site: http://www.banque-france.fr/gb/stat_conjoncture/telechar/stat_mone/tibe.pdf.

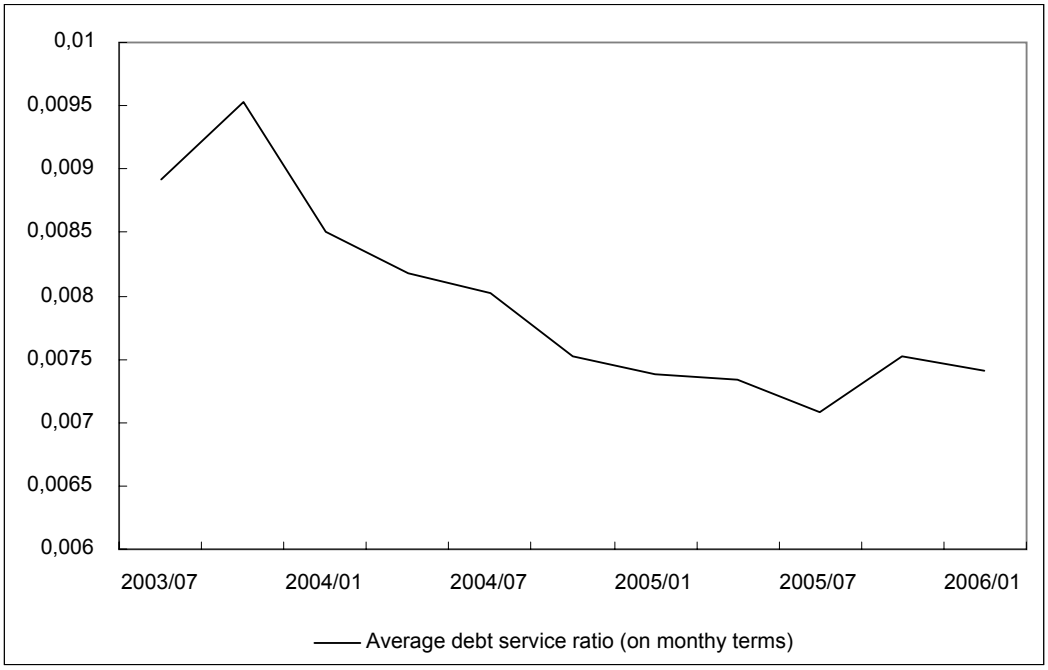
[14] “Large” loans are defined as loans with a value exceeding 95000 euros. They accounted for 50 % of the number of lines reported and accounted for 92.5 % of the total amount of new loans. “Small” loans are mainly dedicated to home improvement and the growth of their average value is rather unsteady and more limited (+ 3.1 % between January 2004 and January 2006).

least as from the end of the nineties. The dispersion of the individual amounts of these large new loans (in percentage of the average) only slightly increase over time, which reflects the development of very large loans (over EUR 450 000).

2. The number of lines reported relating to “large loans” increased by 28.7% between January 2004 and January 2006. This is broadly consistent with the development of the new business volumes during the same period, from EUR 76.1 billion in 2003 to EUR 120.4 billion in 2005 or + 58%, after adjusting for the rise in average value of transactions. The increase in the number of transactions could also be explained by early repayments of existing loans in connection with declining interest rates on new loans up to the end of 2005, as described above.

3. The average value of the redemption rate on new housing loans, defined as the amount of the instalment divided by the principal, has significantly decreased up to the middle of 2005 (from 0.85% in 2004 to 0.74% which amounts to a 22.4% decrease). This reflects a lengthening of the maturity of new loans, which is significant since the mid nineties. At the same time, the income of new borrowers slightly increased (+ 2.0% between 2004 and 2005).

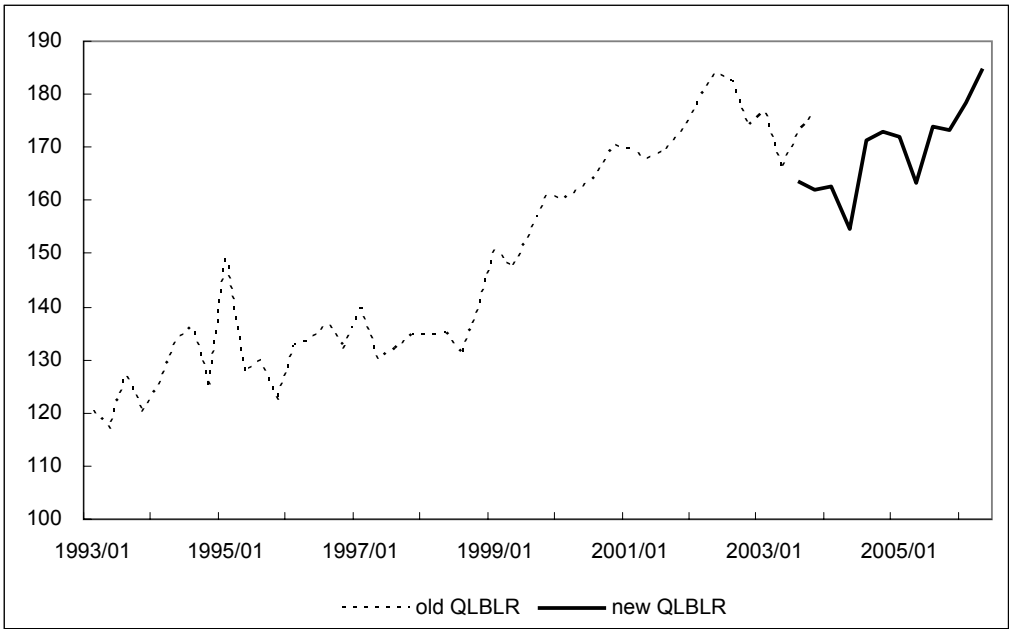
Average debt service ratio
(on monthy terms)



Source and calculation: MIR statistics (QLBLR) and Banque de France.

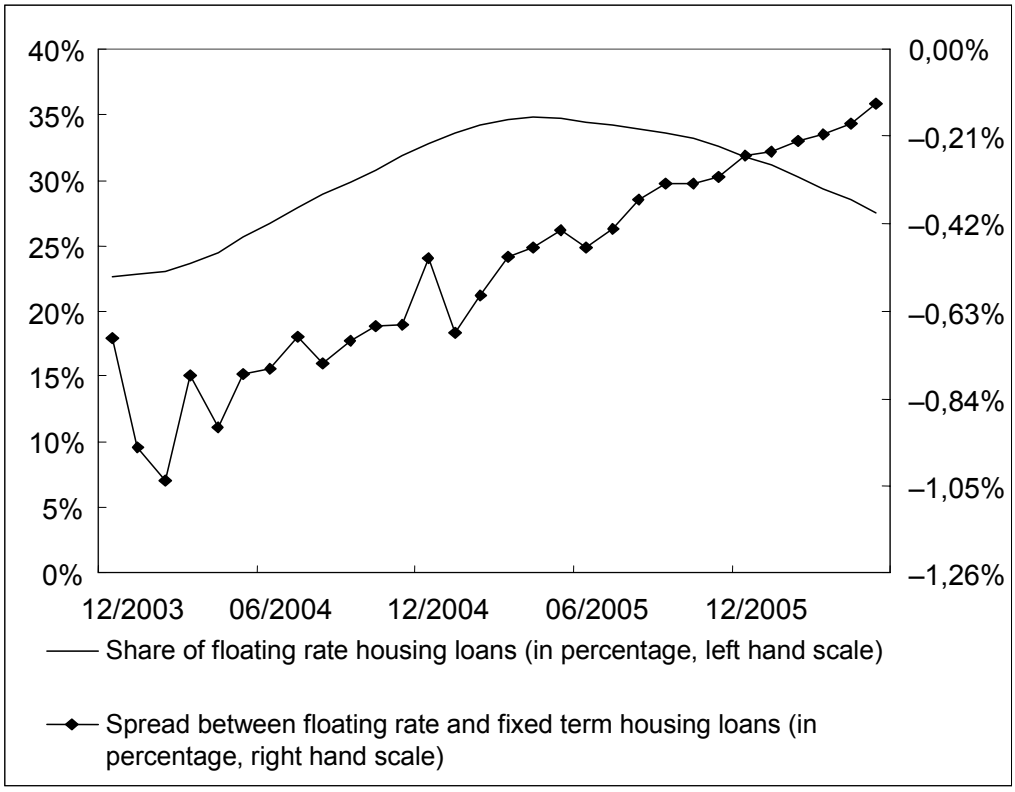
All in all, the debt service ratio on new loans seems to have remained stable or even to have somewhat eased. On the other hand, banks managed to sell more floating rate loans, the share of which in new housing loans peaked up to nearly 35% at the beginning of 2005, which is high by historical standards (less than 20% in the nineties). Households look to be less risk averse and the spread between fixed and floating rates have kept on narrowing. However, a substantial part of floating rates are capped in accordance with the loan contracts.

Duration of new loans



Source: MIR statistics (old and new QLBLR).

Share of floating rate housing loans



Source and calculation: Banque de France's MIR statistics.

4. Conclusion

The stabilization of debt service ratios on new loans due to very low lending rates and the lengthening of their maturity may explain why French households have been able to sustain the development of their debt over the last years. However, this favourable environment is changing because of rising interest rates and given the limits to the lengthening of loans (not least because recent fiscal and regulatory changes have substantially reduced long term deposits, such as housing saving schemes[15]). As a result, households might be more sensitive to the dynamics of housing prices in the future.

[15] See Elizabeth Fonteny 2006: "les conséquences du changement de régime fiscal et social des PEL sur l'épargne logement » http://www.banque-france.fr/fr/publications/telechar/bulletin/etu153_3.pdf.

Measuring German household debt: financial accounts data and disaggregated survey data as complementary statistics[1]

Nikolaus Bartzsch and Elmar Stöss[2]

1. Household debt measured by financial accounts

1.1 Sources of debt

On the macro level debt of households is usually measured by financial accounts. Financial accounts are secondary statistics in so far as different available data sources are collected and put together. The situation may differ from country to country. German households mainly depend on MFI loans, about 90 % of all loans received are granted by banks. Other sources are insurance companies and financial corporations engaged in lending (the so called FCLs belong to the OFI sector according to ESA 95). According to balance of payment statistics a very small amount of debt comes from abroad. It is obvious that this coverage is not perfect: at moment we have no detailed information about loans granted by the government sector to households or about inter-household liabilities. Nevertheless our picture of debt seems to be complete and based on reliable statistics.

In this context it must be taken into account that the definition of the household sector is in line with ESA 95. Therefore self-employed persons or sole proprietorships and non-profit institutions serving households are included. Beside loans financial accounts show other liabilities (other accounts payable) which shall in principle include trade credit, unpaid taxes etc. As no direct information is available, figures are compiled as residuals or as accumulated transaction residuals in the case of outstanding amounts. A very important advantage of financial accounts data is that the frequency of household debt is quarterly. German quarterly data range back to 1991. Yearly data are available back to 1950, but the time series from 1950 to 1990 are not consistent with ESA 95. Before 1991 the household sector did not include housing loans and the liabilities of sole proprietorships. According to ESA 79 both items had been attributed to the enterprise sector.[3]

1.2 Other statistical breakdowns

Beside the complete coverage of household debt data on maturity and purpose are very important for economic analysis. We are able to differentiate between short-term maturity (below 1 year) and longer-term original maturity. (However, no information on residual maturity is available.) Short-term loans are of minor importance. More than 90 % of loans are longer-term. An explanation for this maturity structure arises from the breakdown according to the purpose or use of loans. About two third of loans are mortgage or housing loans. And in Germany housing loans usually are longer-term loans. Even consumer loans are to a

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1 This article represents the authors' personal opinion and does not necessarily reflect the views of the Deutsche Bundesbank.

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3 For the implications of the change from ESA 79 to ESA 95 see Deutsche Bundesbank (2006a, pp 9-12).

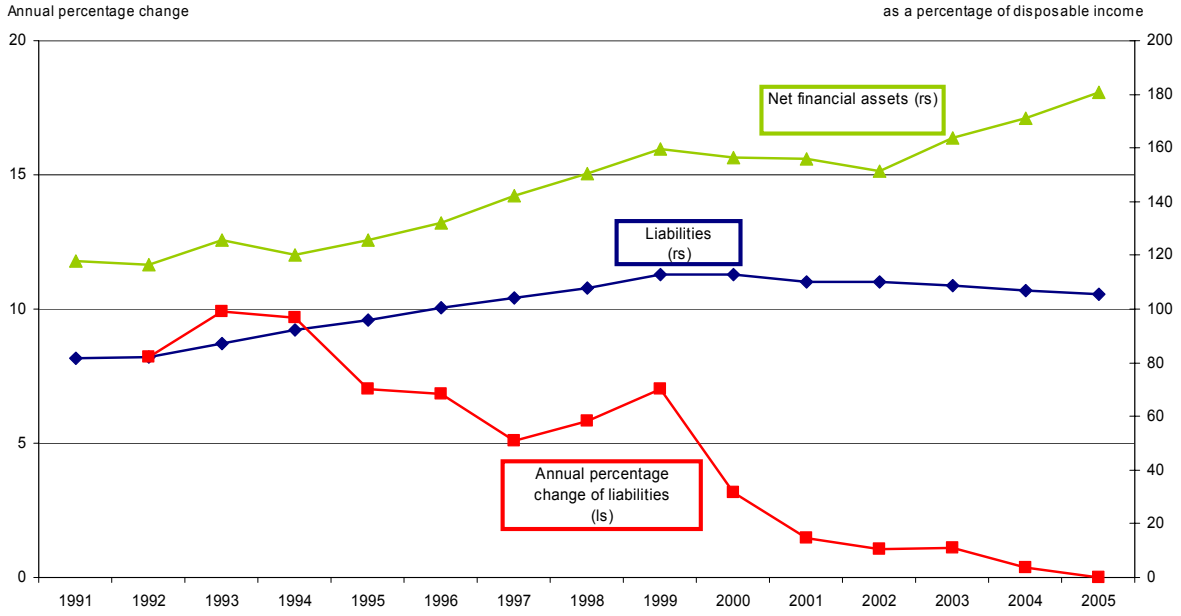
certain extent longer-term debt. Finally we can identify entrepreneurial loans granted to sole proprietorships. With respect to the interest rate contracts with variable interest rates, fixed interest rates or interest rate-cap agreements exist: but there is no detailed information about the relevance of each alternative. For housing loans the most usual agreement is a fixed interest rate contract for a period of 10 years.

1.3 Debt indicators

When analysing the macro data we want to start with a snapshot for 2005 (see table 1).[4] Until the end of 2005 German households accumulated debt of €1,569 billion or €40,000 per household. Only one percent resulted from non-profit institutions. The debt ratio of 105 % of disposable income is relatively high compared to other EU countries. 67 % of all loans were housing loans, 20 % entrepreneurial loans and the remaining 13 % consumer loans. Short-term loans amounted to €86 billion only. The interest burden defined as interest expenditure in relation to disposable income was 4 % in 2005.

1.4 Development of debt from 1991 to 2005

To gain a better understanding of the 2005 figures we want to explain the debt development of the last 15 years. In 1991 total household debt was about €800 billion, nearly half of the 2005 amount. From 1991 to 1999 there was a strong increase of debt (see figure). At that time the yearly growth rates ranged between 5 % and 10 %. Afterwards the growth was significantly lower. In 2004 and 2005 it came down to about zero. The development of the debt ratio underlines this picture. From 1991 to 1999 the debt ratio rose from about 82 % to 113 % of disposable income, from then until 2005 the ratio decreased by 7 percentage points. This development is really different from a few other EU countries. What were the reasons for the German situation? In short, there were two main factors: German unification in connection with housing activities. The demand for housing loans was much higher than for consumer and business loans. After 2000 private housing investment decreased and resulted in a very low demand for housing loans. Contrary to housing loans the stock of entrepreneurial loans even declined, whilst consumer loans have remained more or less constant since 2000.



[4] The yearly results for 2005 are discussed in detail in Deutsche Bundesbank (2006b).

Different developments influenced the indicator interest burden. In the beginning of the nineties interest burden[5] exceeded 5 % of disposable income. At that time the market rates were very high. From 1995 to 2000 the ratio was about 5½ % in spite of the described increase of debt: but the decrease of market rates due to the start of EMU more than compensated the dynamic demand for loans. From 2002 onwards, a further decrease could be observed from 5 % to 4 % in 2005 due to a modest demand for loans and a continued downwards trend of market rates.

1.5 Debt-to-assets ratios

An analysis of the debt situation is not complete if the asset side is not taken into account. For instance, the judgement of an increase of debt also depends on the financial and fixed assets as they can serve as collateral for loans.[6] German households are traditionally net creditors vis-a-vis other sectors. Their assets were much higher than the stock of debt. In 2005 financial assets reached roughly €4,300 billion, fixed assets (housing wealth, machinery and equipment) were at €4,800 billion. Net wealth (total assets minus debt) amounted to 500 % of disposable income (see table 1). On the basis of these aggregated figures (and also in international comparison) the financial position of households seemed to be very satisfactory. This finding is also supported by the development of various debt-to-asset ratios over the 1991-2005 period. In spite of the rapid increase of debt from 1991 to 1999 the ratio of debt-to-financial assets remained relatively stable at 42 %. An important role played financial investment respectively high saving activities. From 2002 to 2005 the ratio decreased to 37 % due to the modest demand for loans and continued saving. The corresponding ratio of debt-to-total assets was only half as high (18 %) in 2005 and more or less constant over the last 10 years. As described above in the last five years housing investment was very low. At the same time the evolution of house prices was very flat, even slightly decreasing. Both resulted from the fact that the debt to total asset ratio did not show a similar improvement as the debt to financial assets ratio.

1.6 Drawback of debt measured by financial accounts

As described above financial accounts give a very detailed overview over the debt situation of German households. The main advantages are complete coverage and quarterly frequency. But due to the nature of a macro-oriented statistics only aggregated data or averages per household can be compiled. No information about the distribution of debt with respect to different groups of households is available. This is a very severe restriction for economic analysis. To fill the gap survey data have to be taken into account. In Germany several disaggregated data sources exist. The most prominent and detailed survey is the Income and Expenditure Survey (EVS) of the Federal Statistical Office (see annex). The main results with respect to household debt are discussed in the next section.

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[5] Alternative indicators of interst burden as well as debt service (total repayments and interest payments) burden for the year 2003 were calculated on the basis of the Income and Expenditure Survey (EVS). These indicators are available for the German households as a whole and the indebted German households as well as according to the monthly household net income. The indicators can be provided by the authors.

[6] See also the discussion in Remsperger and Stöss (2004).

2. Disaggregated survey data and distribution of debt

2.1 Consumer loans

The distribution of average consumer loans according to the Income and Consumption Survey (EVS) of the Federal Statistical Office is analysed with respect to household size, social status of the main income earner, monthly household net income and the age of the main income earner. For each of these four aspects the distribution of average consumer loans is compared with the conditional distribution which is the distribution given details about the size of consumer loans. The difference between these distributions is significant as shown in tables 2 to 5 in the column “Households total”. The average consumer loan per household amounts to €1,400 while the conditional average consumer loan per household is equal to €8,800, that is more than six times the average of the totality of households. This big difference is reflected by the fact that the share of households with details about the size of consumer loans is only 16 %.

2.1.1 Consumer loans according to household size

The distribution of average consumer loans of German households according to the household size is shown in table 2. In the unconditional distribution the value for households with three or more persons is about twice as high as the value for households with one or two persons, which might be explained by higher consumption expenditures of households with children. Similar to the unconditional distribution, in the conditional distribution average consumer loans per household increase with the household size. The variance with regard to the household size is more than three times higher than for the unconditional distribution.

2.1.2 Consumer loans according to the social status of the main income earner

Table 3 describes the distribution of consumer loans of German households according to the social status of the main income earner. In both kinds of distributions the average consumer loan per household is highest for the self-employed and lowest for the non(-gainfully)-employed. This feature could be explained by liquidity constraints which might be binding for the latter group. Of course, liquidity constraints are more related to household income, which shall be investigated in the next subsection. The variance with regard to the social status of the main income earner in the conditional distribution is ten times higher than that of the unconditional distribution. The percentage share of the average consumer loan per household in the average consumer loan per household with details about the size of consumer loans is much higher for blue-collar workers (27 %) than for the other groups. This is an indication of a strong propensity to consume among blue-collar workers.

2.1.3 Consumer loans according to monthly household net income

The distribution of average consumer loans of German households according to monthly household net income is described in table 4. For both kinds of distributions the average consumer loan per household increases in monthly household net income. Average consumer loans significantly increase at the income class boundaries for very low income (€900), middle income (€2,600) and high income (€5,000). A possible explanation for this are liquidity constraints. The higher the income the less binding are liquidity constraints. Accordingly, the percentage share of the average consumer loan per household in the average consumer loan per household with details about the size of consumer loans is especially low for household with very low income (below €900). The variance of the average consumer loan with regard to monthly household net income is almost twenty times higher for the conditional distribution than for the unconditional one. This shows that according to the conditional distribution household debt is distributed rather unequally over the income

range. Of course, this alone is not a suitable measure of the credit risk related to consumer loans. In order to assess this risk, household wealth should also be taken into account.

2.1.4 Consumer loans according to the age of the main income earner

Table 5 shows the distribution of consumer loans of German households according to the age of the main income earner. The path of consumer loans is hump-shaped with a peak at the cohort above the age of 35 and below the age of 45 in the unconditional distribution and a peak at the cohort above the age of 45 and below the age of 55 in the conditional distribution. The hump-shaped paths might be explained by the hump-shaped path of income of German households (see Börsch-Supan, Reil-Held, Rodepeter, Schnabel and Winter (1999)) in connection with the fact, that liquiditiy constraints decrease in income. Another reason might be the high consumption of young households owing to the setting up of a home and getting married and having a family. In line with this, the number of (projected) households with details about the size of consumer loans reaches a maximum at the cohort above the age of 35 and below the age of 45. Moreover, the percentage share of the average consumer loan per household in the average consumer loan per household with details about the size of consumer loans is the highest for the cohorts above the age of 25 and below the age of 45. The strong decline in consumer loans for households with a main income earner above the age of 55 is consistent with the lower consumption needs of elderly persons. Accordingly, the percentage share of the average consumer loan per household in the average consumer loan per household with details about the size of consumer loans is much lower for the cohorts above the age of 65 than for the other cohorts.

2.2 Mortgage loans

The distribution of average (remaining) housing or mortgage loans according to the EVS is analysed as in section 2.1 with respect to household size, social status of the main income earner, monthly household net income and the age of the main income earner.[7] Again, for each of these four aspects the distribution of average mortgage loans is compared with the conditional distribution which is the distribution given details about the size of mortgage loans. The difference between these distributions is significant as shown in tables 6 to 9 in the column “Households total”. The average mortgage loan per household amounts to €25,600 while the conditional average mortgage loan per household is equal to €97,700, that is four times the average of the totality of households. This big difference is reflected by the fact that the share of households with details about the size of mortgage loans is only 26 %. However, this share is 10 percentage points higher than the corresponding share of consumer loans.

2.2.1 Mortgage loans according to household size

The distribution of average mortgage loans of German households according to the household size is shown in table 6. As to be expected, the average mortgage loan per household increases in the household size but the increase is much stronger in the unconditional distribution. Correspondingly, the variance (with regard to the household size) of the average mortgage loan per household is much lower in the conditional distribution than in the unconditional distribution. The percentage share of the average mortgage loan per household in the average mortgage loan per household with details about the size of mortgage loans rises with the household size. For households with more than 3 persons this percentage share amounts to more than 50 %.

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[7] In the following the term “mortgage loan” is used for “remaining mortgage loan”.

2.2.2 Mortgage loans according to the social status of the main income earner

Table 7 shows the distribution of mortgage loans of German households according to the social status of the main income earner. As in the case of consumer loans the average mortgage loan per household is highest for the self-employed and lowest for the non(-gainfully)-employed. The percentage share of the average mortgage loan per household in the average mortgage loan per household with details about the size of mortgage loans is very high (about 50 %) for the self-employed and the civil servants. The corresponding share of the unemployed and non(-gainfully)-employed is much lower (12 %). The difference between these shares can be explained by liquidity constraints or income differences in the case of the unemployed and by the fact that the non(-gainfully)-employed mainly comprise pensioners. The variance (with regard to the social status of the main income earner) in the conditional distribution is about three times higher than the corresponding variance in the unconditional distribution. However, this difference is much lower than in the case of consumer loans.

2.2.3 Mortgage loans according to monthly household net income

The distribution of average mortgage loans of German households according to household net income is shown in table 8. In the unconditional distribution the average mortgage loan per household significantly increases in monthly household net income. In the conditional distribution an increase can only be observed in the lower income range (less than €1,500) and the upper income ranges (more than €2,600). The increase (in absolute terms) is highest in the highest income range (€5,000 to €18,000). A possible explanation for this are liquidity constraints in connection with downpayment ratios. In Germany the average downpayment ratio amounts to about 30 %. The higher the income the less binding are these liquidity constraints.[8] Accordingly, the percentage share of the average mortgage loan per household in the average mortgage loan per household with details about the size of mortgage loans is especially low for household with low income (below €1,500). It rises significantly for higher incomes and amounts to 60 % and more for households with a monthly net income of more than €3,600. The variance (with regard to monthly household net income) in the conditional distribution is about two times higher than the corresponding variance in the unconditional distribution. This discrepancy is much higher for consumer loans.

2.2.4 Mortgage loans according to the age of the main income earner

Table 9 shows the distribution of mortgage loans of German households according to the age of the main income earner. As in the case of consumer loans the path of mortgage loans is hump-shaped. In both distributions the peak is at the cohort above the age of 35 and below the age of 45. Again, the hump-shaped paths might be explained by the hump-shaped path of income of German households (see Börsch-Supan, Reil-Held, Rodepeter, Schnabel and Winter (1999)) in connection with the fact, that liquiditiy constraints decrease in income. In addition the demand of young households for real estate is especially high owing to having a family. In line with this, the number of (projected) households with details about the size of mortgage loans reaches a maximum at the cohort above the age of 35 and below the age of 45. Moreover, the percentage share of the average mortgage loan per household in the average mortgage loan per household with details about the size of mortgage loans is the highest for the cohorts above the age of 35 an below the age of 45. This share clearly declines for households with a main income earner above the age of 65.

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[8] Low income households hardly accumulate own funds. According to the EVS their saving ratios are small or negative.

3. Final remarks

The main results from financial accounts of the Bundesbank are:

- 1991 to 1999: strong increase of debt mainly due to the dynamic demand for housing loans.
- Since 2000 significant decrease of the debt ratio (contrary to other EU countries).
- Housing loans are by far the most important position of household debt.
- Financial situation: stable or even improving debt-to-asset ratios, low interest burden.

The main results from EVS of the Statistical Office are:

- For both consumer loans and mortgage loans the average loan per household with details about loans is much higher than the corresponding average from the unconditional distribution.
- Average consumer loans increase in monthly household net income. For mortgage loans this applies to the unconditional distribution, while in the conditional distribution an increase can only be observed in the lower and the upper range of the distribution.
- The share of households with details about the size of mortgage loans strongly increases in monthly household net income, which might be due to the fact that liquidity constraints (due to the downpayment ratios required by banks) become less binding as income rises.

To conclude, macro and micro data sets provide very fruitful and detailed information for the analysis of German household debt. A crucial question is how to combine these data. On the asset side huge discrepancies can be found between financial accounts and survey data (see annex). But what is surprising for the average level of debt is the fact that the difference is much smaller. Household debt mainly consists of mortgage debt for which the aggregate data of the EVS (contrary to GSOEP) are very similar to those of financial accounts. Concerning consumer loans the GSOEP figures are higher than EVS data. As a whole financial accounts and EVS respectively GSOEP seem to be complementary statistics for the analysis of German household debt.

Annex:
Comparison of EVS, GSOEP and financial accounts

Household debt of German households is analysed with data from the Income and Consumption Survey (EVS) of the Federal Statistical Office for 2003. This is the German equivalent of the U.S. Consumer Expenditure Survey (CEX). It consists of repeated cross-sections based on a quinquennial survey conducted by the Federal Statistical Office. The EVS is the best microdata source for analyses of wealth data because of the big number of recorded households (about 58,000). Another relevant household survey is the German Socio-Economic Panel Study (GSOEP) of the German Institute of Economic Research (DIW). The GSOEP is an annual panel survey that started in 1984. The sample contains about 12,000 households. The GSOEP is similar to the U.S. Panel Study on Income Dynamics (PSID). (A detailed comparison between the EVS and the GSOEP can be found in Becker, Frick, Grabka, Krause and Wagner (2003).)

In the following these data sources shall be compared with financial accounts (of the Deutsche Bundesbank). Table 10 contains net financial wealth and its components according to these data sources. The data in EVS and GSOEP are projected.

Financial wealth is much higher in the financial accounts than in the microdata sets. This can be explained by

- Reporting differences: There is an aversion or inability among households to report or calculate their financial wealth correctly. For example, the discrepancy between financial accounts and EVS wealth in securities (bonds, shares, other equity and mutual fund shares) is especially big. Another indication of the difficulties in recording financial wealth in microdata surveys is the big (and not plausible) share of households that supposedly do not possess any financial assets (about 10 % in EVS and more than 40 % in GSOEP).
- Censoring: Due to the lack of a sufficient number of “rich” participants the EVS does not take into account households with a monthly net income of more than €18,000. Schüssler, Lang and Buslei (2000) estimate the share of financial wealth not reported due to censoring in EVS financial wealth to be about 10 %. This corresponds to an underreporting of about €150 billion in the EVS 2003.
- Differences in the definition of financial wealth: Financial wealth is more comprehensive in the financial accounts than in GSOEP and EVS. The following items are included only in the financial accounts: currency and transferable deposits, certain claims on insurance corporations (for example health insurance and private pension funds) as well as claims from company pension commitments. All in all, these items add up to about €950 billion, which explains almost half of the difference between financial wealth in the financial accounts and EVS.
- Differences in sector classification: In contrast to the microdata sets non-profit institutions serving households are part of households in financial accounts. At the end of 2002 financial wealth of non-profit institutions amounted to about €150 billion.

An important finding is that the difference between financial accounts data and the household surveys is much smaller for household debt than for financial assets.

Table 1

Debt of German households[1]

Item	1991	1995	1999	2000	2002	2004	2005
	in € billion						
Liabilities							
Loans	815	1,138	1,453	1,501	1,538	1,558	1,557
Short-term loans	91	104	112	114	107	90	86
Longer-term loans	724	1,034	1,341	1,387	1,432	1,467	1,471
of which: Bank loans	761	1,066	1,368	1,412	1,448	1,466	1,467
Other liabilities	9	12	9	8	8	11	12
Total	824	1,150	1,462	1,508	1,547	1,569	1,569
Memo item: Non-profit institutions serving households	14	14	15	16	16	15	16
Annual percentage change of liabilities		7.0	7.0	3.2	1.1	0.4	0.0
	in € per household						
	23,400	31,100	38,700	39,600	39,900	40,100	40,000
	as a percentage of disposable income						
	81.6	95.9	112.7	112.8	110.0	107.0	105.4
Loans by purpose	in € billion						
Consumer loans	131	165	199	207	204	206	206
Mortgage loans	492	697	913	947	1,002	1,029	1,039
Entrepreneurial loans	191	275	341	346	333	321	311
Mortgage loans (in % of loans total)	60	61	63	63	65	66	67
Interest expenditure (as a percentage of disposable income)	5.8	5.8	5.0	5.5	5.0	4.2	4.0
Net financial assets (in € billion)	1,190	1,508	2,071	2,094	2,126	2,509	2,691
	in € per household						
	33,700	40,900	54,800	54,900	54,900	64,100	68,500
	as a percentage of disposable income						
	117.9	125.8	159.6	156.6	151.2	171.1	180.8

[1] Definition of the household sector according to ESA 95.

Table 1 (cont)

Debt of German households

Item	1991	1995	1999	2000	2002	2004	2005
Net assets[2] (in € billion)	4,538	5,630	6,586	6,680	6,869	7,292	7,491
	as a percentage of disposable income						
	449	470	508	499	489	497	503
Liabilities (as a percentage of financial assets)	41	43	41	42	42	38	37
Liabilities (as a percentage of total assets)	15	17	18	18	18	18	17

Source: Financial Accounts, Deutsche Bundesbank.

[2] Financial assets plus fixed assets minus debt.

Table 2

Consumer loans of German households according to the household size

	Households total	Of which with … person(s)				
		1	2	3	4	5 and more
Recorded households (number)	58,309	14,056	21,888	9,439	9,237	3,689
Projected households (1000)	37,931	13,733	12,790	5,637	4,306	1,464
Projected households with details about the size of (positive) consumer loans (1000)	5,940	1,662	1,842	1,267	892	277
Average consumer loan per household (€ 100)	14	9	12	22	20	20
Average consumer loan per household with details about the size of (positive) consumer loans (€ 100)	88	77	84	97	97	106
Variance[1]	25					
Conditional variance[2]	83					
Percentage share of the unconditional average consumer loan[3]	16	12	14	23	21	19

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

[1] Variance (with regard to the household size) of the average consumer loan per household.

[2] Variance (with regard to the household size) of the average consumer loan per household with details about the size of consumer loans.

[3] Percentage share of the average consumer loan (per household) in the average consumer loan (per household) with details about the size of consumer loans.

Table 3

Consumer loans of German households according to the social status of the main income earner

	Households total	Of which according to the social status of the main income earner					
		self-employed	civil servant	white-collar worker	blue-collar worker	un-employed	non(-gainfully)-employed[4]
Recorded households (number)	58,309	4,062	5,913	21,177	7,376	3,177	16,604
Projected households (1000)	37,931	2,684	1,621	10,780	7,043	2,261	13,541
Projected households with details about the size of (positive) consumer loans (1000)	5,940	394	312	2,102	1,848	375	909
Average consumer loan per household (€ 100)	14	24	21	16	22	14	5
Average consumer loan per household with details about the size of (positive) consumer loans (€ 100)	88	165	110	83	83	84	69
Variance[1]	51						
Conditional variance[2]	492						
Percentage share of the unconditional average consumer loan[3]	16	15	19	19	27	17	7

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

[1] Variance (with regard to the household size) of the average consumer loan per household.

[2] Variance (with regard to the household size) of the average consumer loan per household with details about the size of consumer loans.

[3] Percentage share of the average consumer loan (per household) in the average consumer loan (per household) with details about the size of consumer loans.

[4] Mainly pensioners.

Table 4

Consumer loans of German households according to monthly household net income

	House-holds total	Of which according to the monthly household net income (€)							
		below 900	900–1,300	1,300–1,500	1,500–2,000	2,000–2,600	2,600–3,600	3,600–5,000	5,000–18,000
Recorded households (number)	58,309	4,068	5,631	3,642	8,705	11,431	13,260	7,646	3,416
Projected households (1000)	37,931	5,509	6,432	3,375	6,713	6,121	5,421	2,681	1,463
Projected households with details about the size of (positive) consumer loans (1000)	5,940	477	895	520	1,152	1,158	1,079	452	201
Average consumer loan per household (€ 100)	14	5	10	11	14	16	21	20	25
Average consumer loan per household with details about the size of (positive) consumer loans (€ 100)	88	53	72	70	84	83	103	121	179
Variance[1]	30								
Conditional variance[2]	577								
Percentage share of the unconditional average consumer loan[3]	16	9	14	16	17	19	20	17	14

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

[1] Variance (with regard to the household size) of the average consumer loan per household.

[2] Variance (with regard to the household size) of the average consumer loan per household with details about the size of consumer loans.

[3] Percentage share of the average consumer loan (per household) in the average consumer loan (per household) with details about the size of consumer loans.

Table 5

Consumer loans of German households according to the age of the main income earner

	House-holds total	Of which according to the age of the main income earner							
		below 25	25–35	35–45	45–55	55–65	65–70	70–80	above 80
Recorded households (number)	58,309	1,247	7,004	15,294	13,491	10,070	4,652	5,108	1,443
Projected households (1000)	37,931	1,152	4,581	8,635	7,609	6,177	3,048	5,126	1,604
Projected households with details about the size of (positive) consumer loans (1000)	5,940	157	1,053	1,978	1,535	759	230	205	/
Average consumer loan per household (€ 100)	14	6	19	21	19	11	6	3	/
Average consumer loan per household with details about the size of (positive) consumer loans (€ 100)	88	41	81	92	96	87	81	69	/
Percentage share of the unconditional average consumer loan[1]	16	15	23	23	20	13	7	4	/

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

/: no information available due to the lack of a sufficient number of recorded households.

[1] Percentage share of the average consumer loan (per household) in the average consumer loan (per household) with details about the size of consumer loans.

Table 6

Remaining mortgage loans of German households according to the household size

	Households total	Of which with … person(s)				
		1	2	3	4	5 and more
Recorded households (number)	58,309	14,056	21,888	9,439	9,237	3,689
Projected households (1000)	37,931	13,733	12,790	5,637	4,306	1,464
Projected households with details about the size of (positive) remaining mortgage loans (1000)	9,940	1,657	3,043	2,145	2,229	867
Average remaining mortgage loan per household (€ 100)	256	101	206	377	577	732
Average remaining mortgage loan per household with details about the size of (positive) remaining mortgage loans (€ 100)	977	838	867	991	1,114	1,238
Variance[1]	32,160					
Conditional variance[2]	17,118					
Percentage share of the unconditional average mortgage loan[3]	26	12	24	38	52	59

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

[1] Variance (with regard to the household size) of the average mortgage loan per household.

[2] Variance (with regard to the household size) of the average mortgage loan per household with details about the size of mortgage loans.

[3] Percentage share of the average mortgage loan (per household) in the average mortgage loan (per household) with details about the size of mortgage loans.

Table 7

Remaining mortgage loans of German households according to the social status of the main income earner

	Households total	Of which according to the social status of the main income earner					
		self-employed	civil servant	white-collar worker	blue-collar worker	un-employed	non(-gainfully)-employed[4]
Recorded households (number)	58,309	4,062	5,913	21,177	7,376	3,177	16,604
Projected households (1000)	37,931	2,684	1,621	10,780	7,043	2,261	13,541
Projected households with details about the size of (positive) remaining mortgage loans (1000)	9,940	1,252	819	3,869	2,146	266	1,589
Average remaining mortgage loan per household (€ 100)	256	839	482	367	231	78	67
Average remaining mortgage loan per household with details about the size of (positive) remaining mortgage loans (€ 100)	977	1,799	955	1,023	757	662	575
Variance[1]	44,492						
Conditional variance[2]	124,908						
Percentage share of the unconditional average mortgage loan[3]	26	47	50	36	31	12	12

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

[1] Variance (with regard to the household size) of the average mortgage loan per household.

[2] Variance (with regard to the household size) of the average mortgage loan per household with details about the size of mortgage loans.

[3] Percentage share of the average mortgage loan (per household) in the average mortgage loan (per household) with details about the size of mortgage loans.

[4] Mainly pensioners.

Table 8

Remaining mortgage loans of German households according to monthly household net income

	House-holds total	Of which according to the monthly household net income (€)							
		below 900	900–1,300	1,300–1,500	1,500–2,000	2,000–2,600	2,600–3,600	3,600–5,000	5,000–18,000
Recorded households (number)	58,309	4,068	5,631	3,642	8,705	11,431	13,260	7,646	3,416
Projected households (1000)	37,931	5,509	6,432	3,375	6,713	6,121	5,421	2,681	1,463
Projected households with details about the size of (positive) remaining mortgage loans (1000)	9,940	225	564	464	1,441	2,028	2,538	1,619	987
Average remaining mortgage loan per household (€ 100)	256	19	44	111	143	256	433	734	1,392
Average remaining mortgage loan per household with details about the size of (positive) remaining mortgage loans (€ 100)	977	456	500	807	668	774	925	1,215	2,063
Variance[1]	90,311								
Conditional variance[2]	169,678								
Percentage share of the unconditional average mortgage loan[3]	26	4	9	14	21	33	47	60	67

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

[1] Variance (with regard to the household size) of the average mortgage loan per household.

[2] Variance (with regard to the household size) of the average mortgage loan per household with details about the size of mortgage loans.

[3] Percentage share of the average mortgage loan (per household) in the average mortgage loan (per household) with details about the size of mortgage loans.

Table 9

Remaining mortgage loans of German households according to the age of the main income earner

	House-holds total	Of which according to the age of the main income earner							
		below 25	25–35	35–45	45–55	55–65	65–70	70–80	above 80
Recorded households (number)	58,309	1,247	7,004	15,294	13,491	10,070	4,652	5,108	1,443
Projected households (1000)	37,931	1,152	4,581	8,635	7,609	6,177	3,048	5,126	1,604
Projected households with details about the size of (positive) remaining mortgage loans (1000)	9,940	(27)	880	3,329	2,828	1,876	508	433	(60)
Average remaining mortgage loan per household (€ 100)	256	(21)	201	413	389	269	105	42	(24)
Average remaining mortgage loan per household with details about the size of (positive) remaining mortgage loans (€ 100)	977	(904)	1,047	1,070	1,047	886	633	501	(649)
Percentage share of the unconditional average mortgage loan[1]	26	(2)	19	39	37	30	17	8	(4)

Source: Income and Expenditure Survey 2003 (EVS 2003) of the Federal Statistical Office and own calculations.

( ): reduced value of information due to a lack of a sufficient number of recorded households.

[1] Percentage share of the average mortgage loan (per household) in the average mortgage loan (per household) with details about the size of mortgage loans.

Table 10

Financial assets and debt of German households

Data source		EVS[1]		GSOEP[2]		Financial accounts[3]	
Time of survey		**beginning of 2003**		**beginning of 2002**		**end of 2002**	
Projected households (EVS, GSOEP) or actual households (financial accounts)		**37,931,000**		**39,099,644**		**38,720,000**	
		total (€ billion)	**per household (€)**	**total (€ billion)**	**per household (€)**	**total (€ billion)**	**per household (€)**
1)	**Financial assets**	**1,529**	**40,300**	**922**	**23,580**	**3,690**	**95,300**
2a)	Consumer loans	53	1,400	141	3,606	204	5,269
2b)	Mortgage loans	971	25,600	672	17,197	1,002	25,878
2)	**Liabilities (2a + 2b)**	**1,024**	**27,000**	**813**	**20,803**	**1,206**	**31,147**
3)	Net financial wealth (1 – 2)	504	13,300	109	2,777	2,484	64,153

[1] Income and Expenditure Survey (EVS) of the Federal Statistical Office.

[2] German Socio-Economic Panel (GSOEP) of the German Institute for Economic Research (DIW) and own calculations. Subsample G of GSOEP ("Oversampling of High Income") is not taken into account.

[3] Financial accounts of the Deutsche Bundesbank (without entrepreneurial loans).

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Swedish households' indebtedness and ability to pay: a household level study[1]

Martin W Johansson and Mattias Persson[2]

1. Introduction

Household borrowing has increased considerably in a number of developed countries over the past two decades; both in absolute terms and relative to household income (see Debelle (2004) and CGFS (2006)). The increase in household indebtedness can be attributed to a number of factors, and structural differences between countries might help to explain why households in some countries have increased their indebtedness more than households in other countries. Two important factors behind the increased indebtedness in developed countries are probably: the financial deregulation of the early 1980s, which decreased the level of credit rationing, and the lower levels of interest rates, both in nominal and real terms. At present, the aggregate household debt ratio (household debt as a share of disposable income) in Sweden stands close to 140 per cent, which is roughly double the figure for 1970. The Swedish credit markets were deregulated in the mid 1980s, and the deregulation was followed by a rapid increase in household debt (see Figure 1). The dismal macroeconomic history of Sweden in the early 1990s is well known, and came about when the onset of a global economic slowdown coincided with both an ultimately futile defence of the Swedish Krona, and a major overhaul of the tax code[3]. The ensuing sharp rise in interest expenditures placed an excessive burden on the households, who responded by sharply cutting back on their borrowing. During the next years, the debt-to-income ratio fell to levels well below the period of the credit deregulation (see Figure 1). In the mid 1990s, the debt burden of Swedish households began to rise again, and this increase has been sustained up until this date, with debt ratios returning to the levels seen just before the banking crisis in the beginning of the 1990s (see Figure 1). Although the debt ratios are almost the same now as then, there are a number of important differences between the situation today and the early 1990s. This is evident in the evolution of the interest ratio (interest rate expenditures as a share of disposable income). While this share was rising during the build-up of household debt in the 1980s, it has constantly been falling the last ten years, and is now near a historic low (see Figure 1). Nonetheless, the increase in indebtedness has raised concerns about the sustainability of household debt, the vulnerability of the household sector and possible implications for the stability of the financial system and credit losses in banks. The purpose of this article is to study the indebtedness and ability to pay of individual indebted households, in order to see if there is a risk of "over-borrowing" and potential significant credit losses in the banking sector. Furthermore, we also study what effect macroeconomic shocks, i.e. higher interest rates and increased level of unemployment have on the indebted households' ability to pay.

The situation in recent years has not only raised questions of what the sharp expansion in credit could entail for the vulnerability of the household sector and the banking sector, but

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[1] The views in this paper are solely the responsibility of the authors, and do not necessarily reflect the views of the Executive Board of Sveriges Riksbank.

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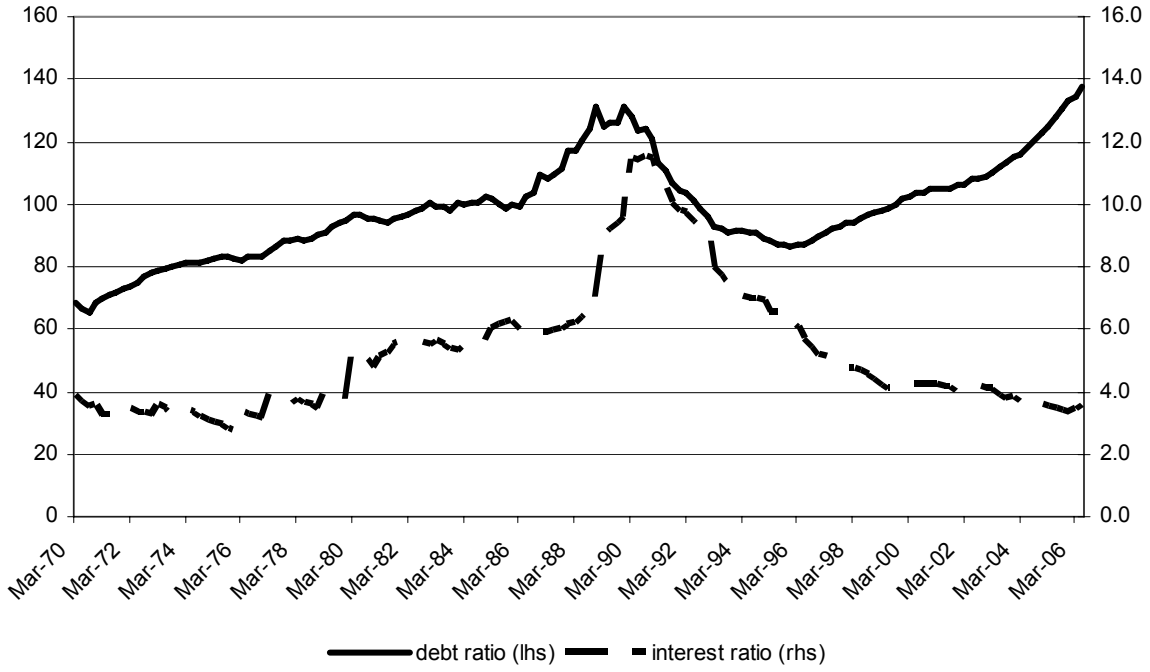
[3] For an excellent account of the Swedish banking crisis in the early 1990s, see Englund (1999).

also how the domestic macroeconomic environment could be affected if this development was discontinued. However, this article focuses on the direct stability aspects of the debt situation and leaves any effects on the general macro economy open. The analysis has been performed on wealth and income data from Statistics Sweden for Swedish households in 2004; the most recent data available.

Figure 1

Household debt and (post-tax) interest rate expenditures as share of disposable income (per cent)



Sources: Statistics Sweden and the Riksbank.

In Section 2, we present the data used in the analysis. This is followed by a bird's eye view on the distribution of income, assets, liabilities and ability to pay within the Swedish household sector in Section 3. In Section 4, we stress the balance sheet of the household sector, with regard to changes in the interest rate and unemployment rate. We also estimate the households' vulnerability at present, their indebtedness and ability to pay, given the recent changes in interest rates, disposable income and indebtedness at the aggregate level. Finally, in Section 5, we provide summary and concluding remarks.

2. The data set

As mentioned in the introduction, the increase in indebtedness has raised concerns about potential effects on the stability of the financial system, if interest rates or unemployment were to rise. These are vital questions, but answering them using aggregate data from the financial- and national accounts, will prove difficult, if not impossible. Aggregate data on income do not differentiate between the income of indebted and non-indebted households, where the latter are irrelevant for analysing potential credit losses. Moreover, aggregate data tell us nothing about the distribution of debt, interest rate expenditures and income. Hence it

is possible that pockets of vulnerabilities are masked by the financially sound segments of the household sector. Given these limitations, the Riksbank has increasingly turned to micro data, more specifically to the HEK-survey, for analysing the balance sheet of the household sector. The HEK-survey, which is compiled by Statistics Sweden (SCB), is a detailed annual survey of the household sector with data on income, debt and wealth. The survey is based on administrative register information, collected from government bodies responsible for income transfers and taxation. Furthermore, approximately half of the participating households are selected for interviews. Each household in the survey is prescribed with a population weight, which corresponds to the number of households in the population that each household represents. This gives the possibility of aggregating the micro data, in order to compare with data from either the national- or financial accounts. The survey has also been used for more academic purposes; see for example Andersson (2001), Bergmark and Palme (2003), Klevmarken (2003) and Flood et al (2004).

The number of households in the survey varies depending on the way a household is defined. A household can either be defined as two adults living together (or one adult living alone), with children below the age of 18, or, basically, as the individuals living under one roof. Using the first definition of a household, the number of participating households number about 20,000. Using the second definition, the number of households are about 17,000. Hence, obviously, the latter definition is more inclusive in its definition of a household. For example, a grown-up child living with his, or her, parents, would count as a separate household using the first definition, but would included with the parents' household using the second definition.

It is not immediately clear which definition should be used. An example will hopefully clarify the choice at hand. In general, there is a return-to-scale effect of individuals living together with regard to living costs. Thus, for example, a 20 year-old male living with his parents may look financially constrained, until one takes into account that his parent are paying for at least some of his running costs. This would suggest that the more inclusive household definition should be used, as it more accurately depicts the conditions "on the ground". However, while his parents may help out with his daily running costs, it does not follow that his parents would bail him out if he took on debt and was unable to fulfil his debt obligations. Hence, since the focal point of exercise is credit losses, the Riksbank works with the first, less inclusive definition. In our example, this would mean that our 20-year old male is counted as single household, although he is living with his parents. However, one should not overstate the consequence of which household definition is used. The majority of the households look the same, regardless of which definition is used. This is particularly true for the households in the higher income echelons, where, as we shall see, most of the debt in the household sector is concentrated.

While the survey gives a detailed insight into the economy of the household sector, it suffers from publication lags. Statistics Sweden calculates a preliminary version of the survey about 15 months after the end of a year which does not include any data on household wealth. The final version of the survey is released a few months later and contains data on the households' wealth, in addition to altering the sample from the preliminary survey to better match the population. As the final version of the survey is released quite close to the preliminary version, the preliminary is only used when the Riksbank's Financial Stability Report is published in the window between the publication of the preliminary and final version of the survey.

Another obvious limitation is that the survey only includes assets, liabilities and income that are reported to the authorities. In practice, this means that the survey underestimates the households' disposable income, due to wages from the informal sector. It is also likely that the sizes of the assets are underestimated, due to offshore investments that are not properly reported to the tax authorities. On the other hand, there is no incentive to underreport debts, partly because the interest rate expenditures are tax deductible, but also because a reported lower net wealth means a lower (or zero) wealth tax. Moreover, real assets are basically defined as real estate, ignoring assets such as jewellery, mink furs, and cars.

Table 1

Income, assets and liabilities of indebted households in 2004

Mean values in thousands of SEK

income category	1	2	3	4	5
Disposable income	78	133	192	288	467
Financial wealth	53	68	105	240	516
Real wealth	317	324	491	911	1843
Debt	177	155	255	450	901
Debt ratio (per cent)	185	117	133	156	193
Interest ratio (per cent)	3.9	3.4	4.2	4.9	5.7
Assets-to-liabilities (per cent)	283	290	265	273	278
Included households (per cent)	18	44	61	82	93

Note 1: 1 SEK corresponds to 0.11 Euro, or USD 0.13.

Note 2: The definition of household debt excludes study loans.

Note 3: The debt (interest) ratio is defined as household debt (interest expenditures) divided by household disposable income.

Note 4: The last row in Table 1 shows the share of households for each income category that are included in the analysis (i.e. are indebted and have a disposable income larger than zero).

Sources: Statistics Sweden and the Riksbank.

3. Debt, income, wealth and the ability to pay in the Swedish household sector

To analyse the distribution of debt, income, wealth and ability to pay, the household sector is divided into five equally large categories, according to their level of disposable income. The ultimate purpose of the analysis is to find pockets of vulnerability, which, under stress, may translate into credit losses in the banking sector. Households that do not hold any debt, and hence are unable to cause any credit losses, are excluded from the analysis, unless otherwise stated. Thus we only study the indebted households within each income category[4]. Descriptive statistics for the five income categories can be found in Table 1. As can be discerned from Table 1, high disposable income, high indebtedness and large assets tend to go hand in hand. Note that since we only study indebted households, the number of included households varies between the income categories. In the first category, only 18 percent of the households hold debt and have positive disposable income. This share rises as we traverse across the income categories and in the last income category 93 per cent of the

[4] Apart from excluding non-debt holding households, we also exclude households with a negative disposable income. A household can, for example, have a negative disposable income if it earns zero (or close to zero) income on labour and/or capital, while it at the same time pays property tax or wealth tax.

households hold debt. It is also instructive to compare the debt ratios and interest ratios in Table 1, with those calculated from aggregate data (see Figure 1). While the aggregate debt ratio in 2004 hovers just above 120 per cent, the debt ratio for the highest income category is in excess of 190 per cent. The household sector also seems to have sufficient collateral to back their liabilities, as can be seen from the "assets-to-liabilities" row in Table 1. All income categories have, on average, assets worth more than twice the value of their liabilities[5].

A more through investigation of the data set shows that the differences can be quite large within the individual income categories as well. The most heterogeneous group is category 1. This group is difficult to distinguish, since it consists of individuals with very different characteristics and life situations. The statistics show that a major part of these households do not have employment, income, assets or liabilities. Moreover, as can be seen from Table 1, the mean disposable income in the first income category is quite low, and many households would find it hard to make sustenance on such incomes. Hence, there is reason to be sceptical towards the quality of the data in the lowest income category.

Distribution of assets and liabilities

In total, assets constitute about 276 per cent of the value of total liabilities, but the distribution is highly skewed towards the top income earners (see Figure 2). The bars in Figure 2 should be interpreted as follows: Indebted households in the highest income category (i.e. the indebted households of the 20 percent households with the highest disposable income) hold 57 per cent of the total debt in the household sector (chequered bar). However, the same households also hold 35 per cent and 49 per cent of the financial and real assets, respectively (black and white bars). The reader should be aware, that while the debt shares for all income categories sum to 100 per cent, the shares of financial and real assets in Figure 2 do not sum to 100 per cent, as some of the assets are held by households that are not indebted. In total, the indebted households hold 86 percent of the real assets, compared to only 57 per cent of the financial assets. The fact that indebted households hold a larger portion of the real wealth, compared to the financial wealth, is not very surprising, since the majority of the household debt has been used to accumulate real assets (i.e. houses and owner-occupied flats). Furthermore, comparisons with earlier years show that the distribution of assets and liabilities across the income categories is stable over time.

Households' ability to pay

An indebted household can service its debts in two ways, either by using its disposable income, or by capital gains from selling off assets. In the longer run, most households would find it hard to service its debts from capital gains, so this way is presumably used as a last-ditch effort to avoid default. Unlike real assets, financial assets are relatively easy to realise, and can therefore serve as a short-term buffer against unexpected, temporary, drops in disposable income. Nonetheless, under normal circumstances, households use their disposable income to service their debts, and therefore, a study of the households' ability to pay also requires some idea of how large a proportion of the income that is dedicated to interest expenditures, and how much income a household has left after it has serviced its debts. As was shown in Table 1, households with high income, in general, have both a higher interest ratio and debt ratio.

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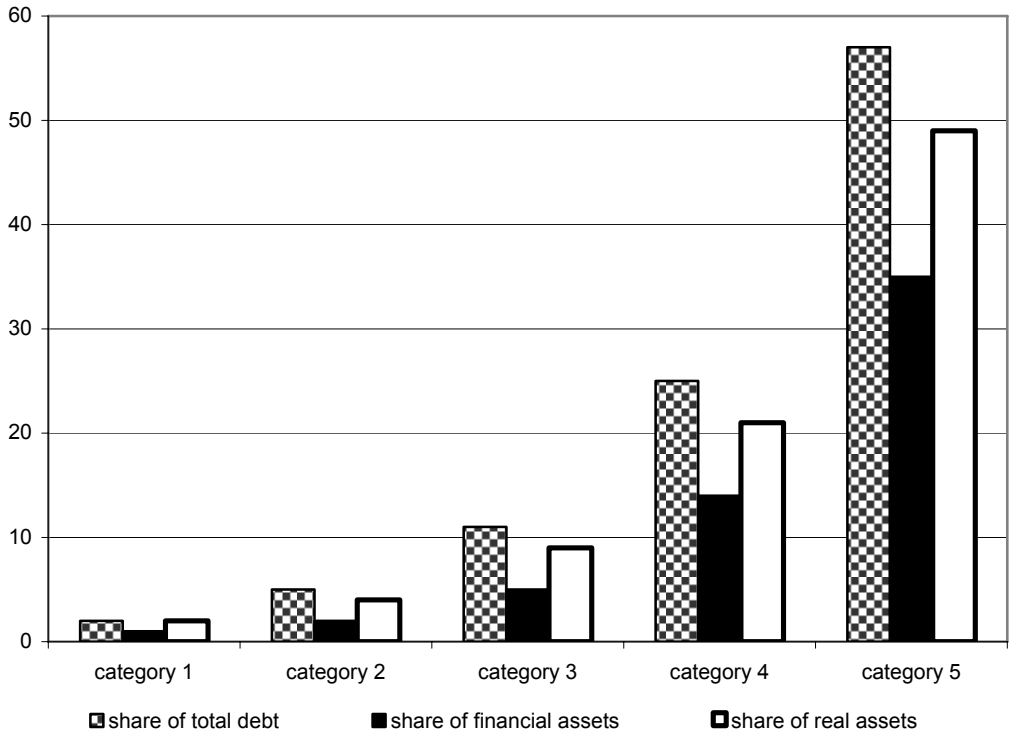
[5] Total assets include households' financial assets including insurance saving, and the market value of owner-occupied and tenant-owned dwellings and secondary dwellings. Other items are rental property, agricultural property and other property including building sites. Assets also include a small item called "other assets".

Figure 2

Indebted households' share of assets and liabilities held in 2004 by income category (per cent)



Sources: Statistics Sweden and the Riksbank.

In order to get an idea of households' vulnerability to changes in income or expenditure, the economic margin of household *j*, M_j, is calculated:

$M_j = Y_j - iD_j - RC_j$

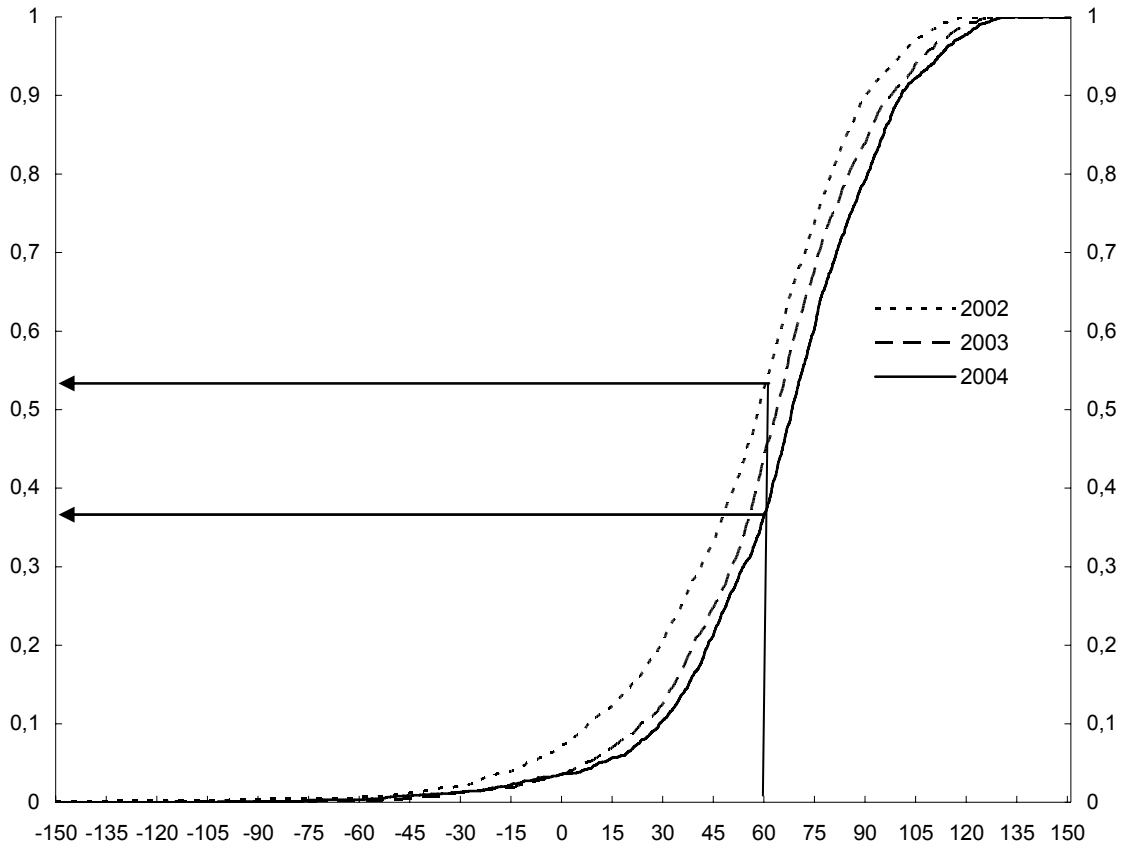
where Y_j is the household's disposable income, iD_j is the interest expenditure and RC_j are other running costs. The margins thus measure how much income each household has left, after it has serviced its debts, and paid for the necessary living costs. If a household has a margin less than zero, this would mean that it would find it hard to make ends meet, and might therefore default on its debts. In our analysis, we assume that the probability that household *j* defaults on its debts (p_j^D), is one if the margin is less than zero. On the other hand, if the margin is larger than (or equal to) zero the household will not default on its debts.

The living costs, RC_j, consist of two components. The first component is what roughly can be described as day-to-day expenses, such as clothes and food. Statistics Sweden calculates how much each household needs as a minimum to cover such costs, where care is taken of the household's size and composition. The second component is non-interest housing costs, such as electricity and rent. Unfortunately, there is no information on these costs in the HEK-survey. However, Statistics Sweden publishes another (much smaller) expenditure survey, called the HUT-survey, which has information on such costs for each income decile. To estimate these non-interest housing costs for each household in the HEK-survey, we map these expenditures from the HUT-survey to the HEK-survey, i.e. the top ten percent earners in the HEK all get the same costs as the mean of the top ten percent earners in the expenditure survey. Nonetheless, the running costs are by all likelihood somewhat

underestimated, both with regard to their mean and variance. For example, we have no information on the cost of child care. Moreover, individuals who work need to transport themselves to and from work twice a day. This can either be very cheap (walking) or expensive (car). The analysis of the ability to pay also becomes somewhat simplified because, in reality, it can be more difficult for a household to realise its assets (especially real assets) or to adapt to lower running costs.

Figure 3

Cumulative distribution of household margins for income category 3 (thousands of SEK and per cent)



Sources: Statistics Sweden and the Riksbank.

A convenient way to illustrate the distribution of the households' ability to pay is to calculate the cumulative distribution of the margins for each income category, which looks like an S-shaped curve (see Figure 3). This gives an indication of how many households, in each income category, that are below margin and how close the other households are to the margin. In Figure 3 we plot the cumulative distribution of the households' margin for income category 3 for the years 2002, 2003 and 2004[6]. Figure 3 should be interpreted as follows: in 2002, about 53 per cent of the households in income category 3 had an annual margin of 60 000 SEK or less. In 2004, this share had decreased to 37 per cent. Thus, the households in income category 3 have significantly strengthened their financial position between 2002

[6] The households' margins for 2002 and 2003 are calculated from earlier versions of the HEK-survey.

and 2004. By moving the vertical line (the one stuck at 60 000 SEK in Figure 3) to the left and right, one quickly gets an idea of how sensitive the households in each income category are to changing income or increasing costs.

However, as the ultimate purpose of the study is to monitor potential credit losses in the banking sector, it does not suffice to just calculate the proportion of households that lie below margin, without taking into account their share of the total debt of the household sector, and the value of the assets that can be used to cover losses incurred by a default. Hence, we calculate two measures, the "Exposure at Default" (EAD), which measures the share of total household debt held by households with a margin less than zero, and the "Loss Given Default" (LGD), which measures the share of debt, held by households with a margin less than zero, that is not covered by the households' financial or real assets. More specifically, we calculate our LGD's as follows: if a household defaults on its debts (i.e. the margin of the household is less than zero), the creditors stand to loose the negative value of the net wealth, NW_j, of the household, if the net wealth is negative. For example, if a household defaults on its debts, and it has assets and liabilities worth 8 000 SEK and 10 000 SEK, respectively, the creditor will suffer a credit loss equal to -(8 000 -10 000) SEK = 2 000 SEK. If the net wealth is greater than (or equal to zero) the default will not incur any credit loss on the creditors as the debts are fully covered by the assets. In the example above, if the defaulting household had assets worth 12 000 SEK, the creditor would not suffer any credit losses, as the value of the assets covers the liabilities by a margin of 2 000 SEK. To calculate the projected credit loss incurred by each household, we multiply p_j^D (which is either 1 or 0) with L_j (which is equal to the negative value of the net wealth, if the net wealth is negative). The credit losses can then be summed together, either within income categories, or across the entire population. The LGD's are then defined as aggregate projected credit losses divided by the outstanding stock of household debt.

Formally:

$$p_j^D = \begin{cases} 1 \text{ if } M_j < 0 \\ 0 \text{ otherwise} \end{cases}$$

$$L_j = \begin{cases} -NW_j \text{ if } NW_j < 0 \\ 0 \text{ otherwise} \end{cases}$$

$$LGD = \frac{\sum_j (p_j^D \times L_j)}{\text{total household debt}}$$

It is worthwhile to stress that our LGD's need *not* be identical to those calculated by the banks. Our measure should be viewed as a risk metric, that we are able to construct, given the data available to us, and not as an attempt replicate the LGD's in the banks' loan books.

In Table 2, we calculate some statistics on the proportion of households with negative margins, EAD's, and LGD's within each income category. Table 2 should be interpreted as follows: the second column lists the proportion of indebted households that lie below margin per income category; these households are also called "vulnerable" households. The next column shows the vulnerable households' share of total household debt. The last column shows the debts, held by vulnerable households in each category, that are not covered by assets, as a share of total household debt. For example, in income category 2, 6.4 per cent of all indebted households have a margin that is less than zero. These 6.4 per cent, in turn, hold 1.2 per cent of all household debt. If these households were to default on their debts, their assets would be claimed by the creditors. The debt, held by the defaulting households that would not be covered by the assets, amount to 0.14 per cent of the total debts held by the household sector. If one repeats the exercise for all the indebted households, one arrives at the following conclusion: 6.3 percent of all the indebted households in the survey have negative margins and thus, at least technically, run a risk of cancelling their debt servicing.

Together, these households hold 5.6 per cent of the total household debt. If they were to default on their debts, the creditors would suffer losses corresponding to 0.9 per cent of total household debts. This figure is substantially higher than actual credit losses, as reported by the banks. Although some the lending to the households is channelled trough other creditors, where credit losses presumably are higher than in banks and mortgage institutes, one can not abstract from the fact that projected credit losses of 0.9 per cent seem too high. In practice, this means, that according to the survey, the households would default more frequently on their debts, than they actually do[7]. One may also note that more than half of the credit losses stem from the lowest income category, even though this category only holds 2 per cent of total household debt (see Figure 2). This supports the suspicion aired earlier, that the households, especially in the first income category, have incomes and assets that are not recorded in the survey.

Table 2

Vulnerable households, EAD and LGD

(per cent)

Income category	Share of households below margin in each income category	EAD (as share of total debt)	LGD (as share of total debt)
Income category 1	64.2	1.8	0.49
Income category 2	6.4	1.2	0.14
Income category 3	2.8	1.4	0.09
Income category 4	0.5	0.6	0.04
Income category 5	0.1	0.7	0.11
All income categories	6.3	5.6	0.9

Sources: Statistics Sweden and the Riksbank.

4. Stress testing the household sector

In the event of a marked deterioration in the ability to pay, due for example to higher interest rates or increased unemployment, some households could encounter difficulties in servicing their debt, and banks' credit risks would mount. While the cumulative distribution of the margins, presented in the previous section, are useful for visualising the margins, they are not really useful for stress testing, unless we translate hypothetical macroeconomic outcomes into shifts in the share of vulnerable households, EAD and LGD. This section presents partial arithmetic examples that show how the ability to pay and risk of loan losses are affected by a rise in the interest rate and unemployment. The ability to pay is tested with the assumption that the interest rate is raised by 1-3 percentage points, and that unemployment increases by 1-3 percentage points. The effects that are studied, are the change in the proportion of vulnerable households, the impact on banks' exposure to this group (i.e. the EAD) and the projected LGD's. How the proportion of vulnerable households changes, after deterioration in their finances indicate their sensitivity. The fraction of the

[7] At the height of the banking crisis in Sweden, the banks suffered credit losses on their household lending, corresponding to 0.7 per cent of the outstanding household debt.

households' total loans that can be attributed to these vulnerable households can be seen as a measure of the increased credit risk in lending, and the LGD as a measure of how severe the credit losses would be, if the vulnerable households indeed defaulted. It should be pointed out that these partial calculations do not take account of stylized business cycle effects. Normally, interest rates rise in conjunction with more robust economic activity. Such conditions are also accompanied by stronger household income, but this has not been included in these calculations as income is held constant.

Effects of rising interest rates

How sensitive the households are to changes in the interest rate depends on the fixed-rate terms of their loans. Households with variable-rate loans are affected immediately by a change in rates, while for fixed-rate loans, the effect is only felt when the loans are renegotiated. In the following calculations, the short-term effects are studied first, given the fixed-rate terms that the Swedish households have on their loans[8]. This is followed by an analysis of the long-term effects that arise when the change in the interest rate affects the entire debt stock. All the loans are assumed at that stage to have been renegotiated at the new higher rate.

Table 3

Effects of rising interest rates

(per cent)

Increase in interest rate (p.p)	0	1	2	3
Households below margin in each income category	6.3	6.4 (6.6)	6.6 (7.1)	6.7 (7.3)
EAD	5.6	5.8 (6.8)	6.5 (8.2)	7.2 (9.2)
LGD	0.9	0.9 (1.1)	1.0 (1.3)	1.1 (1.4)
Interest ratio	5.1	5.4 (5.9)	5.7 (6.7)	6.1 (7.6)

Note: The estimates outside the parentheses denote the immediate effect of an interest rate hike, where only the loans with adjustable interest rates are affected. The estimates inside the parentheses denote the long-term effect where the entire debt stock is renegotiated at the higher interest rate.

Sources: Statistics Sweden and the Riksbank.

The second column of Table 3 shows the effect of a zero rise in the interest rate, which of course, only reproduces the results from Table 2. A rise of 1 percentage point in the general level of interest rates would result in an increase in the households' average interest ratio from 5.1 to 5.4 per cent in the short term. In the long-run, when all loans have been renegotiated at the new, higher, level of interest, the interest ratio rises to 5.9 per cent. The proportion of households below the margin is largely unchanged (from 6.3 per cent to 6.4 per cent in the short-run and 6.6 per cent in the long-run). The LGD (i.e the debts of the vulnerable households, that are not covered by assets) are also essentially unaffected. Thus, the credit risk in household lending is almost insensitive to a 1 percentage point increase in

[8] About 60 per cent of the loans in stock of household debt are fixed rate loans.

the interest rate. At the other extreme, if the interest rates instead rise by 3 percentage points, the average interest ratio would increase to 6.1 per cent in the short run, and 7.6 per cent in the long-run. But nor does the sharper rise in interest rates affect the proportion of households below the margin to any great extent (6.7 per cent and 7.3 per cent, in the short- and long-run, respectively). The EAD increases somewhat more (7.2 per cent and 9.2 per cent, in the short- and long-run, respectively) and the LGD increases to 1.1 per cent in the short-run and 1.4 per cent in the long-run.

The important question is, of course, if one should be alarmed by the projected LGD, following an interest rate hike of 3 percentage points. The answer to this question is, by all likelihood, no. First of all, during the banking crisis in the early 1990s, the losses on household lending amounted to 0,7 per cent of total household lending. These losses never posed any severe problems for the banking sector (losses on commercial property did, however). Secondly, while our projected LGD amounts to 1.1 and 1.4 per cent (in the short- and long-run), they grossly overstate actual LGD (see the previous section). Hence, if the interest rate was to rise by 3 percentage points, the actual LGD would be far lower than our projected LGD. Hence, it is not likely that a three percentage point increase in the interest rate would entail any significant problems for the banks in the form of credit losses.

Effects of rising unemployment

In the event of unemployment an individual suffers a loss of income equivalent to the difference between its previous wage and the unemployment benefit it receives from *arbetslöshetskassan*. Could an increase in unemployment affect the banks' credit losses in a way that would give cause for concern? We employ a Monte Carlo approach and simulate the effects of unemployment among the employed individuals, where all individuals in a household with employment run the risk of becoming unemployed. After a simulated increase in the level of unemployment, the disposable income, given the present rules for unemployment benefits, and all other statistics are recalculated. The simulations are repeated 1 000 times for each level of aggregate unemployment. In these calculations, all gainfully employed persons have been assigned an equally large probability of becoming unemployed. In reality, those running the highest risk of becoming unemployed in an economic downturn, are those who recently joined the labour market (i.e. youths, immigrants and previously unemployed). As these individuals in general have not accumulated any substantial amounts of debt, the implied effect on the banks credit losses from an increase in unemployment is likely to be overestimated.

The results from the simulation can be seen from Table 4, which is constructed in an identical manner to Table 3. Following an increase in the unemployment rate by three percentage points, the proportion of vulnerable households rises from 6.3 to 6.7 per cent, while the EAD at the same time increases from 5.6 to 6.3 per cent. More importantly, however, is that the LGD is essentially unchanged, even in the face of a 3 percentage point rise in unemployment. That the interest ratio is not affected is partly because the interest rate is held constant in the calculations and partly because the decline in disposable income caused by the rise in unemployment is too small to make any impact on the ratio. The important lesson from comparing Table 3 and Table 4 is that the effects on the households' ability to pay are far less in the event of an increase in unemployment, than in the case of a rise in the interest rate. One explanation for this is the composition of the households' debt and income. Household debt is by and large concentrated to the highest income category. These households often consist of two employed adults, and hence the household has dual incomes. Thus, even if one individual in the household becomes unemployed, the other individual's income, together with the unemployment benefit, is usually enough to cover living costs and interest rate expenditures.

Table 4

Effects of rising unemployment

(per cent)

Increase in unemployment (p.p)	0	1	2	3
Households below margin in each income category	6.3	6.5	6.6	6.7
EAD	5.6	5.8	6.1	6.3
LGD	0.9	0.9	0.9	0.9
Interest ratio	5.1	5.1	5.1	5.2

Note: The estimates are the medians of the Monte Carlo replicates.

Sources: Statistics Sweden and the Riksbank.

Falling asset prices and LGD's

Even if a household defaults on its loans, the creditors will still be able to recover a clear majority of debts from the household's assets, as is indicated in Table 3 and Table 4. However, the estimates in Table 3 and Table 4 are, of course, only strictly valid at the prevailing value of the real and financial assets (which conceptually translates into the existing residential property prices and share prices). In a situation of macroeconomic stress, it is likely that both the value of real and financial assets fall, and an asset-to-liability ratio, that might have seen prudent in good times may no longer be enough. It would, obviously, be possible to calculate a very large number of combinations of a fall in wealth, rising unemployment and interest rate hikes, but it would be very hard to present the result to the reader without resorting to burdensome tables. From the preceding sections, it is clear that a rise in the interest rate posed a bigger threat to banks, w.r.t. credit losses, than a rise in unemployment. Thus, it seems reasonable to investigate the combined effect on the LGD of a sharp rise in the interest rate *and* a fall in the level of wealth.

Table 5

LGD and falling asset prices combined with a 3 per cent increase in interest rate

(per cent)

Remaining financial wealth → Remaining real wealth ↓	100 %	90 %	80 %	70 %
100 %	1.1 (1.4)	1.1 (1.5)	1.1 (1.5)	1.1 (1.5)
90 %	1.2 (1.6)	1.2 (1.6)	1.2 (1.6)	1.2 (1.6)
80 %	1.3 (1.7)	1.3 (1.7)	1.3 (1.8)	1.3 (1.8)
70 %	1.4 (1.9)	1.5 (2.0)	1.5 (2.0)	1.5 (2.0)

Note: The estimates outside the parentheses denote the immediate effect of an interest rate hike, where only the loans with adjustable interest rates are affected. The estimates inside the parentheses denote the long-term effect where the entire debt stock is renegotiated at the higher interest rate.

Sources: Statistics Sweden and the Riksbank.

Table 5 shows the combined effect of a 3 percentage point rise in the level of interest *and* an erosion in the level of real and financial wealth. Judging from Table 5, the LGD's are much more sensitive to changes in real wealth, than to changes in financial wealth. This is not very surprising, given the fact that real wealth constitutes nearly 80 percent of total household wealth. One question that has been put forward is, whether a sharp rise in the interest rate, combined with a fall in residential property prices, could put the banking sector under strain. The answer to this question, according to Table 5, is no. Suppose that, the interest rates were to rise by 3 percentage points. This would, *ceteris paribus*, at most, lead to a fall in house prices by 20 per cent, according to econometric estimates made by the Riksbank, see Financial Stability Report 2005:2. A fall in house prices by 20 per cent (which roughly would translate into a 20 per cent drop in real wealth) combined with a 3 per cent interest rate hike, would, according to Table 5, shift the LGD's from their present ratio of 0.9 per cent, to 1.3 per cent in the short-run and 1.7 per cent in the long-run. Hence, in the long-run credit losses from household lending would barely double. Given that present actual credit losses (as reported by banks) are close to zero, it would be hard to argue such a shift would put the banking sector under severe strain.

Households' ability to pay 2005

So what is the current situation for individual households' ability to pay? Since 2004 households have continued to borrow at a high rate, and the value of real and financial assets has strengthened. To what extent has this influenced the proportion of vulnerable households, the EAD's and the LGD's of the population? To estimate this, we use aggregate data from the national- and financial accounts to, in effect, try to forecast what the HEK-survey will look like in 2005. This, of course, neglects the "micro aspects" of the data set, but if we abstract from these, and focus aggregate credit losses, the forecasts can still be of interest. In this case, we use aggregate data on interest payments, debt, disposable income, residential property prices, stock indices and inflation and map the evolution of these variables between 2004 and 2005 to each household in the survey, i.e. each and every household gets an equal increase (in percentage terms) in disposable income, debt, wealth, cost-of-living etc.

These calculations are shown in Table 6. As expected, the household sector, as a whole, has continued to strengthen its financial position during 2005. The proportion of vulnerable households has dropped to 5.7 per cent, the EAD has dropped to 5.2 per cent and the LGD has edged down 0.1 percentage point. Thus, if anything, the credit risk in lending to households has continued to fall since the end of 2004.

Table 6

Vulnerable households, EAD and LGD, all income categories

(per cent)

	Share of households below margin	EAD (as share of total debts)	LGD (as share of total debts)
2004	6.3	5.6	0.9
2005 (forecast)	5.7	5.2	0.8

Sources: Statistics Sweden and the Riksbank.

5. Summary and concluding remarks

Household borrowing has increased considerably in the last years in Sweden, which has raised questions of what it entails for the vulnerability of the households and the banking sector. In this paper we studied the households' assets, liabilities and ability to pay, using Swedish micro data from 2004. One important conclusion is that the majority of the loans are attributable to households that have high incomes, and also account for the majority of real and financial assets. In fact, the 20 per cent top earners account for 57 per cent of the debts and 44 per cent of the total assets of the household sector. Only 0.1 per cent of these households were deemed to vulnerable in the sense that they would not have margins to cope with adverse changes to their balance sheets. The most vulnerable households, those that have no margins for unexpected expenses, are largely debt-free. We also stress tested the balance sheets of the households, where we subjected them to both mild and sharp increases in the interest rate and the level of unemployment. The lessons from these stress tests are that the household sector is much more sensitive to increases in the interest rate, as compared to changes in the level of unemployment. However, not even a sharp increase in the interest rate (such as an instant increase of 3 percentage points), combined with large falls in the value of the real assets of household sector, was deemed to be sufficient to generate credit losses in the banking sector large enough to pose a threat to the stability of the financial system. The high indebtedness, however, could give rise to problems for individual households. Even though household indebtedness at present is unlikely to inflict significant credit losses on the banking industry, it is clear that the situation that has prevailed during the last years, where debt has grown twice the rate of nominal income, is unsustainable in the longer run. This point was also made in the latest issue of the Riksbank's Financial Stability Report (Financial Stability Report, 2006:1).

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Are there significant disparities in debt burden across Canadian households? An examination of the distribution of the debt service ratio using micro-data

Umar Faruqui[1,2]

1. Introduction and summary

The household debt-to-income ratio in Canada has increased from 110 per cent in 1999 to 123 per cent in 2005. This rapid debt accumulation has raised concerns about the ability of households to deal with debt payments if interest rates increase or if they face a negative economic shock.

The debt service ratio (DSR) is one metric to gauge the burden of debt servicing for households and has been the focus of increased scrutiny as of late. In Canada - up until now - most of the analysis of the household DSR has been based on aggregate data, which show that households' debt servicing burden is near historic lows. However, these aggregate data average across all households and can mask information about the distribution of the debt burden.

A number of studies have examined household indebtedness using micro data. These include Canner et al. (1995) and Barnes and Young (2003) for the U.S., May, Tudela and Young (2004) for the U.K. and Herrala (2006) for Finland. The studies suggest a number of common results. In particular, they find that: (a) the micro data evidence on household financial health matches up relatively well with the information from aggregate data, and (b) households that have high debt levels are also those that can most safely bear that debt burden.

In this paper we examine the distributional properties of the DSR for Canadian households using micro data, which show that:

- Debt and asset holdings of households are relatively well-matched.
- The incidence of variable rate debt has increased over the last seven years, with older and richer households holding a larger proportion of their debt at variable rates than younger, poorer households.
- The distribution of the DSR has not changed much since 1999.
- The density of households in the vulnerable tail of the DSR distribution has decreased since 1999, especially for lower-income households.

Overall, we find that the micro data support inferences based on the aggregate data: despite the increase in the debt-to-income ratio since the late 1990s, households' financial health remains sound.

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[1] The views expressed in this paper are those of the author. No responsibility for them should be attributed to the Bank of Canada.

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The remainder of this paper is organized as follows. The next section provides some background on the DSR. Section 3 describes the micro data used for the analysis. Section 4 outlines the recent update to the Bank of Canada's aggregate DSR. Section 5 examines the distribution of the DSR across Canadian households, and section 6 concludes with a discussion of the results and a list of future steps for this topic.

2. Background

2.1 What is the DSR?

The DSR measures the proportion of disposable income (net of taxes and transfers) that households must devote to servicing their debt obligations. The ratio can be calculated two different ways. The traditional DSR calculation only considers interest payments on debt as the cost of debt for households. An alternate measure includes both interest payments as well as principal repayments in debt servicing costs. The Bank of Canada's (henceforth Bank) aggregate DSR measure (discussed below) adheres to the more traditional definition and considers only the interest service burden of debt for the household sector.

Both definitions of the DSR have their advantages and disadvantages. The interest-only DSR (IO-DSR) is often easier to calculate from the data as it requires less detailed information about debt repayments. Changes in the IO-DSR are also simpler to interpret and can be used to isolate the impact of interest rate changes on the household's debt burden. However, the IO-DSR captures only a portion of the cost of debt, as principal repayments can form an important component of debt obligations, especially for mortgage debt. The IO-DSR may, therefore, provide a misleading picture of the household debt burden in a high debt, low interest rate environment. Under these conditions, the IO-DSR may understate the actual burden of servicing debt on households. The DSR measure that includes interest and principal repayments (IP-DSR) is an arguably better measure of the household debt burden as it includes all debt-related payments that a household has to make. The IP-DSR is, however, often harder to estimate since it requires more detailed information on non-revolving loans.

The IP-DSR is our preferred measure of households' debt service burden and we use this measure for the analysis of the distribution of the DSR in section 5. However, when discussing the Bank's aggregate DSR, we are obliged to work with the IO-DSR due to data limitations.[3]

2.2 Why is the DSR of interest to central banks?

The DSR provides information for both monetary policy and financial stability. For monetary policy, the DSR can be used to estimate the proportion of household disposable income available for discretionary purchases. When the ratio is high (relative to some benchmark), households have fewer funds to spend on current consumption. Furthermore, households with a high debt service burden are more likely to be adversely affected by a negative shock, such as an employment or life event shock. If there are a large number of households with a high DSR, current period consumption may be more adversely affected by a negative shock than otherwise. Finally, a high debt service burden may constrain a household's access to credit affecting its ability to smooth consumption over time.

For financial stability the DSR can be used to measure the household sector's ability to service its debt over time. If this ability deteriorates - i.e. the DSR rises significantly following

[3] Work is underway to expand this aggregate measure to include principal repayments as well as interest payments.

a negative shock - financial institutions may face rising loan arrears and/or personal bankruptcies. This would translate into a deterioration in their asset positions, lowering their profitability and potentially making the financial system more vulnerable. For these reasons, the DSR is closely followed by central banks.

While the aggregate DSR can provide useful information about the debt service burden on the average household, it provides no insight into the distribution of that debt burden across households. An analysis of the DSR distribution requires micro household data and is a useful complement to the aggregate measure. If the DSR distribution has a 'fat' right tail, it means that a large proportion of households have a high DSR. Under these circumstances a negative macro-economic event would probably lead to a larger impact on aggregate consumption of households than if the DSR distribution was not skewed. Furthermore, there would be a higher risk to financial stability as a larger number of households may be at risk of default or bankruptcy than otherwise.

2.3 Calculation and current use of the DSR at the Bank

Up until now, the Bank has focused on the IO-DSR based on aggregate data. The reliance on aggregate data has been due, in large part, to the paucity of comprehensive and timely micro data on household balance sheets.[4] The aggregate DSR has been used by the Bank to assess the implications of rising interest rates on the household debt servicing burden via scenario and stress-testing analyses.[5]

The Bank's IO-DSR is based on aggregate debt and disposable income data from Statistics Canada.[6] There are two steps in calculating the ratio from these data. First, the aggregate debt data are broken down into more recognizable loan categories and second, an effective interest rate is applied to each loan category in order to estimate the interest servicing cost of the debt. These steps require assumptions about the relative proportion of each loan category in total outstanding debt and interest rates paid on each type of loan. The assumptions prior to 1999 are based on a mix of anecdotal and survey evidence, while the post-1999 assumptions are based on information from the Canadian Financial Monitor survey (discussed in Section 3). The resulting DSR is denoted by the following equation:

$$IO - DSR_t = \frac{\sum_i (r_{i,t} \times Debt_{i,t})}{DI_t} \quad (1)$$

Where:

'*i*' = different categories of household loans,

'*r*' = effective interest rate on each category of loan,

'*Debt*' = outstanding balance on each category of loan, and

'*DI*' = aggregate disposable income for the household sector.

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[4] For example, the Survey of Financial Security - a survey of household finances compiled by Statistics Canada - is only available for selected years (e.g. 1984, 1999 and 2005) and lacks detailed information on the debt side of household balance sheets to construct a DSR measure.

[5] See December 2004, *Financial System Review* for more details.

[6] Aggregate debt data are from the National Balance Sheet Accounts, while disposable income data are from the National Income and Expenditure Accounts.

3. The data

Data from the Canadian Financial Monitor (CFM) forms the basis for the analysis presented in this paper. These data not only allow us to refine the Bank's aggregate IO-DSR but also let us explore the distributional aspects of the DSR (based on the IP-DSR measure).[7]

This section describes the CFM data and presents selected stylized findings about household asset and debt distributions using these data.

3.1 Description of the CFM survey

CFM is a household survey conducted by Ipsos Reid Canada and provides detailed balance sheet information. The survey, which started in 1999, has a sample size of approximately 12,000 households annually who respond through a mail-in form.[8,9] Currently we have seven years of survey data, from 1999 to 2005.

The survey content has remained roughly unchanged since the inception of the survey in 1999. The 2005 survey consisted of ten sections of questions: five sections on assets, three on debt and one each on banking behaviour and household characteristics. The household characteristics section collects information on the age group of the household head, family income, family size and marital status of the household head, amongst other things. Up until now, CFM data have been primarily used by Canadian financial institutions for market research.

3.2 Comparing CFM data with other datasets

CFM data compare favourably with other Canadian household survey data. CFM has one year of overlap (1999) with Statistics Canada's Survey of Financial Security (SFS)[10] and for that year the two surveys match up relatively well, especially on the debt side of household balance sheets.[11]

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7 While data limitations only allow estimation of the IO-DSR at the aggregate level, CFM allows the estimation of both the IO- and IP-DSRs. We choose to focus on the IP-DSR measure from CFM for the distributional analysis for the reasons outlined in section 2.1.

8 The survey has a monthly distribution target of 1,600 in January, February and March and 800 in each of the remaining months of the year. Respondents are given incentives for completing and returning valid surveys including draws for prizes. The response rate for the survey was roughly 35 percent for the 2003-2005 period.

9 The survey has both a cross-sectional and panel dimension. Of the approximately 12,000 households included in the sample in each year about half are from a rotating panel. For the 1999-2005 period, there are approximately 56,000 households for whom we have more than one observation and 3,000 for which we have a full time series of seven observations. Future work with CFM will examine the usefulness of this panel aspect of the data.

10 While the periodic nature of the SFS does not make it suitable for ongoing analysis, it is nonetheless a useful quality check for CFM. In fall 2006, the 2005 SFS survey data will become available allowing a more comprehensive robustness check of the CFM data.

11 Based on internal analysis by Geoff Wright and Nicholas Brewer of the Bank of Canada.

Table 1

Annual growth in debt - macro vs. micro data

	Aggregate data						Micro data		
	Statistics Canada (NBSA)			Bank of Canada			CFM		
	Consumer	Mortgage	Total	Consumer	Mortgage	Total	Consumer	Mortgage	Total
2000	9.2%	4.3%	6.1%	12.6%	4.8%	7.1%	11.8%	–0.1%	2.9%
2001	8.8%	4.4%	6.1%	6.8%	4.0%	4.9%	7.0%	7.8%	7.6%
2002	7.2%	5.5%	6.2%	6.5%	7.4%	7.1%	8.1%	7.3%	7.5%
2003	7.1%	6.5%	6.7%	8.7%	8.2%	8.3%	–0.2%	4.1%	2.9%
2004	7.0%	6.7%	6.8%	9.9%	9.8%	9.8%	10.8%	–1.2%	2.0%
2005	7.2%	6.9%	7.0%	12.2%	10.1%	10.8%	8.7%	9.8%	9.5%
Avg: 2000-05	**7.7%**	**5.7%**	**6.5%**	**9.5%**	**7.4%**	**8.0%**	**7.7%**	**4.6%**	**5.4%**

There are two different sources of aggregate household debt information for Canada: Statistics Canada's National Balance Sheet Accounts (NBSA) and the Bank of Canada's credit data based on bank returns.[12,13] The estimated debt levels from CFM are noticeably lower than both sets of aggregate data.[14] While there is more noise in the micro data than in the aggregate data, the growth in household debt from CFM and the aggregate data sources show a roughly similar trend of increasingly rapid household debt accumulation over the 1999-2005 period (Table 1).[15]

3.3 Caveats about CFM

While the debt-side of the CFM data compares relatively well with other micro data and the aggregate data, the survey is not without its weaknesses. First, we find that the asset side information from CFM is noticeably different from the SFS (for 1999).[16] Second, CFM

[12] Bank credit data are available as part of the *Weekly Financial Statistics* publication at http://www.bankofcanada.ca/en/wfsgen.html.

[13] There are two primary differences between the two sets of aggregate data. The first difference involves the definition of the household sector: the NBSA data includes unincorporated businesses into the household sector, while the Bank's data does not. Second, the classification of debt is different across the two sets of aggregate data: NBSA classifies debt by type of borrower, while the Bank's data classifies according to the use of funds. For example, if a business borrows money to build an apartment building, it would be included in household debt under the Bank definition but not under the NBSA guidelines.

[14] Aggregate debt levels implied by the CFM micro dataset are generally about 80 per cent of those from the aggregate sources. This could be a result of two factors. First, there are conceptual differences between the micro and macro data. In particular, the NBSA's definition of the household includes unincorporated businesses and the Bank of Canada includes loans by businesses for residential investment. CFM only includes borrowing by households. Second, evidence from other studies suggests that households tend to under-report both their debt and asset holdings in surveys.

[15] A comparison of the mean IO-DSR from CFM vs. that from the aggregate data is presented in Appendix 1. We find that the estimates from CFM and aggregate data show very similar trends over the 1999-2005 period.

[16] While it is not clear what factors account for the differences between total asset levels from CFM and SFS, we suspect that survey collection method may be a factor.

information on loan, asset balances and household income are collected as ranges and not as a point estimate, which may introduce noise in information extracted from CFM. Using the mid-point of the range as a point estimate of loan, asset balances and income is a second-best solution, especially when the ranges become wide. Third, the income groups are top and bottom coded, which means, for example, that any household with an income greater than $150,000 is coded as being in the ">$150,000" income group. Similar problems arise with loan and asset balances. Finally, since CFM is a mail-in survey, it is likely to contain more internal errors and inconsistencies than, for example, phone surveys where the interviewer can probe the household to ensure that they answer in an internally consistent manner.

3.4 Selected stylized findings from CFM

For the presentation of the stylized findings we define the following groups according to household characteristics: (1) income groups: low income (gross family income of less than $35,000), middle income ($35,000<= income <$70,000), and high income (income>=$70,000), and (2) age groups: young (age of household head less than 35 years), middle-aged (35<= age <50), and old (age>=50).[17] Table 2 shows the distribution of Canadian households by income and age groups.

Table 2

Proportion of population in income and age group[1]

	Middle			Sum
	Young	**Aged**	**Old**	
Low-income	0.08	0.10	0.19	**0.37**
Middle-income	0.09	0.13	0.13	**0.34**
High-income	0.06	0.14	0.09	**0.29**
Sum	**0.23**	**0.36**	**0.41**	

[1] Pooled data, 1999-2005.

Most Canadian households carry some form of debt. The proportion of households with positive debt levels has declined slightly from 77 per cent in 1999 to around 75 per cent in 2005.[18] Table 3 shows the distribution of debt and assets by age and income groups. These results indicate that debt holdings differ markedly by demographic and financial characteristics, and are broadly consistent with predictions from the life-cycle theory of consumer behaviour. In particular, the table shows that: (1) middle-aged households hold the majority of total outstanding debt, even though they form a smaller portion of the population than older households, (2) debt holdings initially increase with the age of the household but then decline as the households reach old age, and (3) richer households hold a relatively

[17] The definition of income groups is arbitrary but is broadly consistent with definitions used by Statistics Canada (Statistics Canada, "*Income in Canada, 2004*". Cat. # 75-202-XIE). According to Statistics Canada, households earning below 50 per cent of the median income are considered low income. The median gross income for Canadian households was $63,100 in 2004.

[18] This is comparable to figures for the U.S., which show that roughly 74 per cent of U.S. households hold some form of debt (Barnes and Young, 2003).

large proportion of debt given their size in the population. On the other side of the balance sheet, asset holdings increase with both income and age. A number of other studies (e.g. Edelberg and Fisher (1997) and Reserve Bank of Australia (2003)) have found similar results for other developed countries.

Table 3

Proportion of debt and assets held by household groups[1]

	Middle			Sum
	Young	**Aged**	**Old**	
Debt				
Low-income	0.04	0.04	0.04	**0.11**
Middle-income	0.12	0.15	0.07	**0.34**
High-income	0.15	0.29	0.11	**0.54**
Sum	**0.31**	**0.48**	**0.21**	
Assets				
Low-income	0.01	0.03	0.10	**0.14**
Middle-income	0.05	0.10	0.18	**0.32**
High-income	0.07	0.23	0.24	**0.54**
Sum	**0.13**	**0.36**	**0.52**	

[1] Pooled data, 1999-2005.

Households with high debt relative to assets can be more vulnerable to shocks[19] and those households with a high proportion of debt at variable rates would have debt service payments, which are very sensitive to any increase in interest rates.[20] Therefore, two questions of particular interest for policy makers that CFM can help address are: (1) Do high-debt households also have high asset balances? and (2) what type of debt (variable vs. fixed, for example) is held by different categories of households?

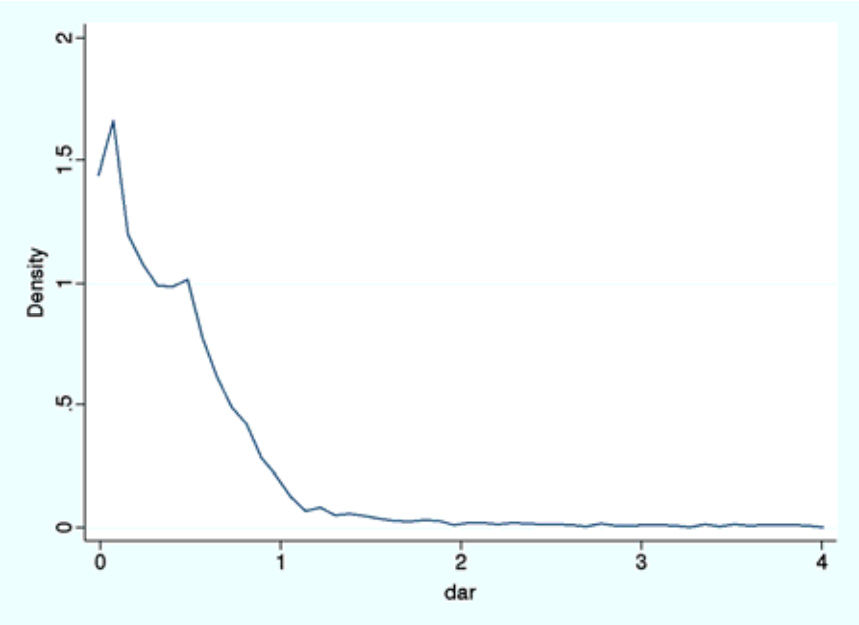
Figure 1 shows the distribution of the debt-to-asset ratio (DAR) for households with non-zero debt. While the DAR from CFM should be interpreted with some caution for the reasons outlined in section 3.3, the trends in the data can provide useful information. The strong left skew in the DAR distribution suggests that (for the most part) debt and asset holdings of households are well matched.

[19] Debt-to-liquid assets may be a more revealing ratio for some purposes. We leave that analysis for future work.

[20] For certain types of variable rate debt (e.g. variable rate mortgages) the monthly payments don't change when interest rates change. Instead, the proportion of the fixed monthly payment that goes towards repayment of principal adjusts accordingly. Our analysis abstracts from this point.

Figure 1

Distribution of debt-to-asset ratio across households[1]



[1] Pooled data, 1999-2005. Excludes households with zero debt and extreme outliers.

Closer examination of the tails of the DAR distribution shows that while the median of the distribution has declined since 1999, the density of households with very high DAR[21] has increased somewhat (Table 4).

Table 4

Selected DAR statistics by year[1]

	Median	Density: DAR >2
1999	0.32	4.7%
2000	0.33	5.1%
2001	0.33	5.2%
2002	0.36	4.6%
2003	0.31	5.2%
2004	0.30	6.6%
2005	0.29	6.8%

[1] Excludes households with zero debt and extreme outliers.

[21] We define vulnerable households with regard to the DAR as households with a DAR above two, which is consistent with the fact that, from 1987 to 2004, the average DAR of insolvent households in Canada has hovered around two.

An examination of the breakdown of debt by type of interest rate for different age and income groups shows that older and high-income households are more likely to carry variable-rate debt than other households (Table 5).

Table 5

Proportion of debt on variable rates[1]

Low-income	0.16	0.17	0.24
Middle-income	0.15	0.19	0.27
High-income	0.18	0.27	0.34

[1] Pooled data, 1999-2005. Excludes households with zero debt.

We also find that (confirming anecdotal information to this effect) the incidence of variable-rate debt has increased from 14 per cent in 1999 to 32 per cent in 2005.[22] The data show that the increase in the holding of variable-rate debt was widespread across income and age groups. This increase in the popularity of variable rate debt can be accounted for, in part, by the rising spread between long and short-term interest rates in Canada over the 1999-2005 period.[23]

Summary

Overall, the stylized facts from CFM suggest that:

- The debt and asset positions of households are reasonably well matched, with richer households holding a large proportion of overall household debt.
- Older households hold a larger share of their debt at variable rates than younger households.
- The share of variable debt holdings by all household groups has been increasing over recent years. It could be argued that the higher incidence of variable rate debt makes households' financial obligations more sensitive to interest rate increases. However, as the most recent anecdotal information from our contacts at financial institutions suggests, households do adjust their borrowing behaviour (and relatively quickly) in response to movements in interest rates. Since September 2005, the short-term rate in Canada (as proxied by the prime rate) has increased by 175 basis points and the spread between long and short-term interest rates has narrowed. At the same time, households have swiftly moved away from variable-rate and towards fixed-term debt.[24]

[22] Variable rate debt includes variable rate mortgages, leases and other consumer loans on variable rates. Fixed rate debt includes credit card debt, fixed-rate mortgages and consumer loans on fixed rates.

[23] The interest rate on variable-rate debt products is usually based on the short-term interest rate, while rates on fixed-rate debt products are based on the relevant long rate.

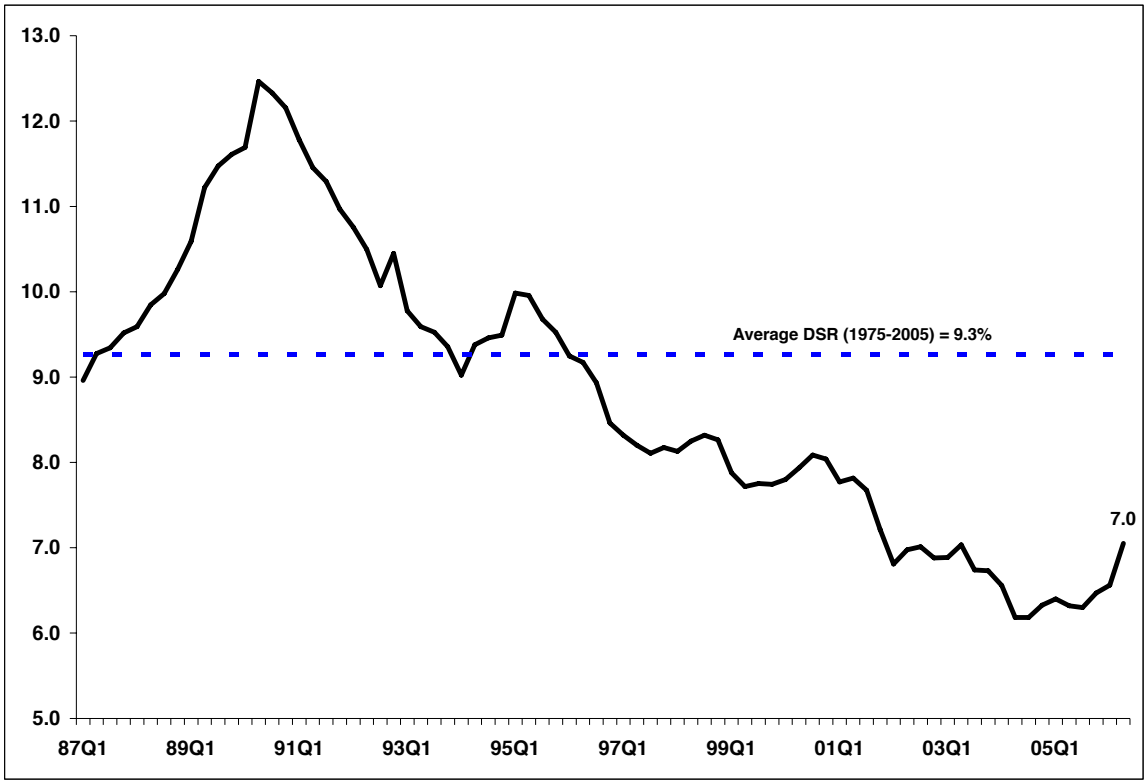
[24] This is especially true for mortgage debt where it is relatively easy for households to switch from variable to fixed rates.

4. Update to the aggregate IO-DSR

Our aggregate IO-DSR for the post-1999 period has been recently updated using information extracted from CFM. The new aggregate IO-DSR estimate incorporates two main improvements and updates to the underlying assumptions. First, consumer debt is now partitioned into finer categories: credit card debt, secured personal lines of credit (PLCs), unsecured PLCs, other personal loans (fixed rate), other personal loans (variable rate), and automobile leases.[25] The finer breakdown allows us to better capture the impact of important changes in consumer credit, notably the substitution away from personal loans and credit card debt to secured PLCs, since the late 1990s.[26] Second, the assumptions regarding the breakdown of mortgage debt and effective interest rates on different types of mortgage products are updated. This update better reflects the impact of the shift from variable to fixed rate mortgages and the presence of prevalent discounting on variable rate mortgages (as seen over recent years) on the IO-DSR.

Figure 2

Aggregate IO-DSR for the Canadian household sector



According to the aggregate estimate, the burden of servicing existing debt (interest-only) for Canadian households was well below the historical average in 2006Q2, suggesting that the household sector is in good financial health. Since 2000, the IO-DSR has trended down even as the debt-to-income ratio has increased rapidly. These two observations are reconciled by the decline in the effective interest rate on debt over this period.

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[25] Under the previous DSR assumptions, consumer debt was only subdivided into two categories: variable and fixed rate loans.

[26] This shift is important because secured PLCs - which bear lower interest rates compared to other forms of consumer credit - have contributed to reducing households' debt-servicing costs.

While the aggregate IO-DSR is a useful indicator of household financial well-being, it has some shortcomings. These include:

- Arguably what matters for monetary policy and financial stability is the total debt burden on households including principal repayments. Future work at the Bank will try to extend the aggregate debt burden measure to include principal repayments but at the moment there is a lack of adequate information for this calculation.
- The aggregate DSR measure can mask potential issues with the distribution of the debt service burden across households. For example, if the distribution of the DSR was skewed to the right, it would mean that there is a high incidence of households with an elevated debt service burden. This, in turn, may have implications for both monetary policy and financial stability as it may affect the response of the household sector to macro-economic shocks. Since the aggregate DSR estimate provides no information about the underlying distribution of that debt burden across households, it is important to augment the aggregate analysis with micro data analysis of household indebtedness. An analysis of the DSR distribution across households is provided in the next section.

5. Distributional analysis of the household debt burden

In this section we address three main questions using CFM data: (1) how is the debt service burden distributed across households? (2) has this distribution of the DSR changed over recent years? and (3) what is the density of households in the vulnerable tail of the DSR distribution?

As mentioned above, the total debt burden (i.e IP-DSR) is arguably a more useful indicator than the interest-only measure (IO-DSR). Due to data constraints on the aggregate level, calculating an aggregate IP-DSR is quite hard. By contrast, CFM has data on total debt payments including principal repayments thus allowing a calculation of the IP-DSR. We use the IP-DSR for the distributional analysis presented in this section.[27] The IP-DSR for each household ('*j*') and year ('*t*') is estimated as follows from the micro-data:[28]

$$IP-DSR_{t,j} = \frac{\sum_{i} payment_{i,j,t}}{GI_{t,j}} \qquad (2)$$

Where:

'*i*' = mortgage loans, personal lines of credit, auto loans, outstanding credit card balance, other personal loans,

'*j*' = household ID,

'*payment*' = estimated annual payment to service loan,[29] and

'*GI*' = gross household income.

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[27] As shown in Appendix 2, both the IO- and IP-DSRs estimated from CFM show similar trends over the 1999-2005 period. Therefore, the general conclusions from our analysis of the IP-DSR should also hold for the IO-DSR.

[28] Households that provide incomplete information about loans (needed for the estimation) are excluded from the calculations. This filtering decreases the coverage to around 80% of households with non-zero debt for IO-DSR and 82% of eligible households for the IP-DSR calculation.

[29] The survey collects data on the most recent payment on each loan and the frequency of the payment. We estimate annual loan service payments by assuming that the last loan service payment is representative of the periodic payments and then annualizing the periodic payment using the given frequency of payment.

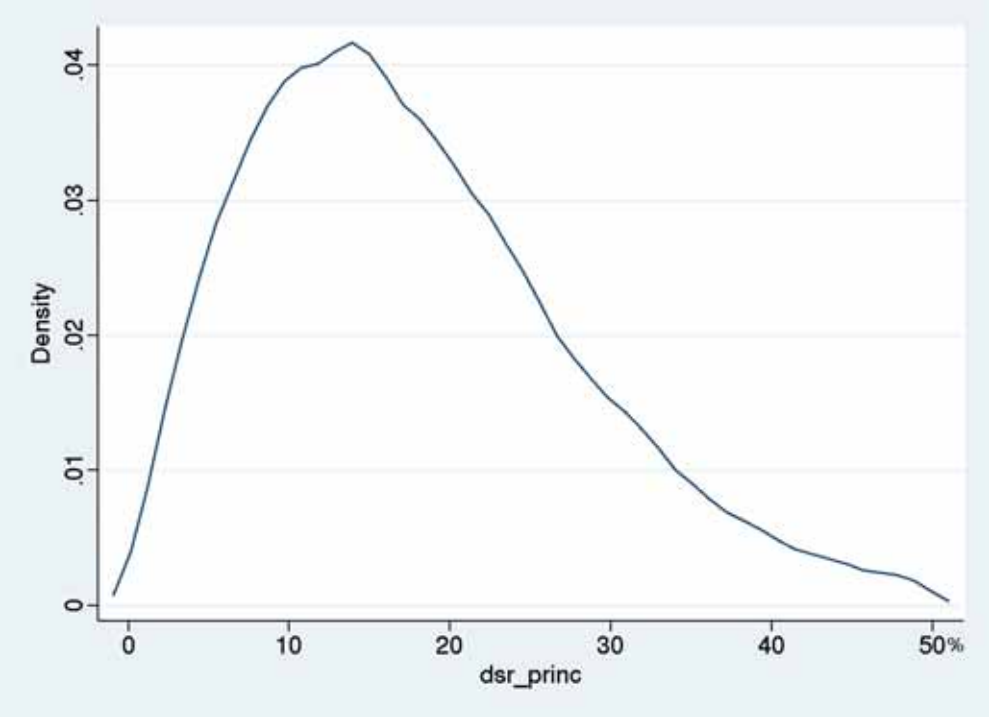
An important point to note in the formula above is that the CFM-based measure for IP-DSR uses gross income rather than disposable income in the denominator. This is because there isn't enough information in CFM to estimate disposable income of the household.[30]

5.1 DSR distribution across Canadian households

Figure 3 shows the distribution of the IP-DSR across all households, conditional on the household having a positive debt balance.[31] The figure shows while the distribution is positively skewed, the long right-hand tail is quite thin, i.e. a relatively small number of households have a high IP-DSR.

Figure 3

Distribution of the IP-DSR[1]



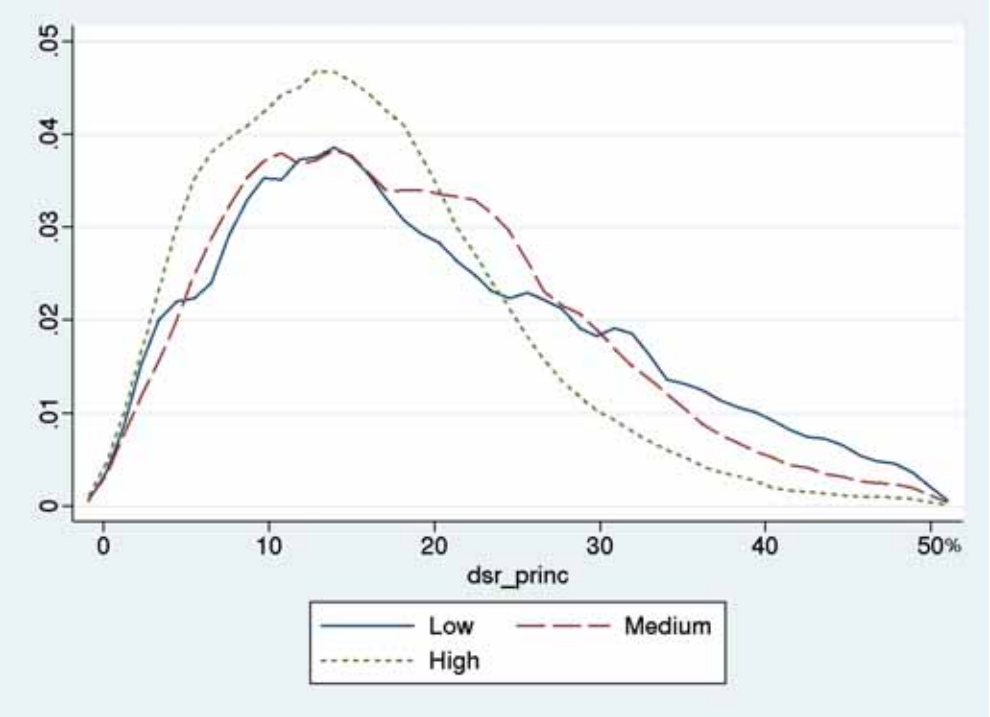
[1] Pooled data, 1999-2005. Excludes extreme outliers and households with no debt. Kernel density is the fitted density curve based on CFM DSR distribution data.

[30] The qualitative results from our analysis would be unlikely to change if we were able to use disposable income rather than gross income.

[31] This condition excludes those households with a zero DSR.

Figure 4

Distribution of the IP-DSR by income groups[1]



[1] Pooled data, 1999-2005. Excludes extreme outliers and households with no debt.

A priori, we would think that the distribution of the debt service burden would be different across households with different income. Indeed, the micro-data show that there is marked variation in the distributions of the IP-DSR for the three income groups. In particular, the lower income households have a more positively skewed distribution than higher income households (Figure 4).

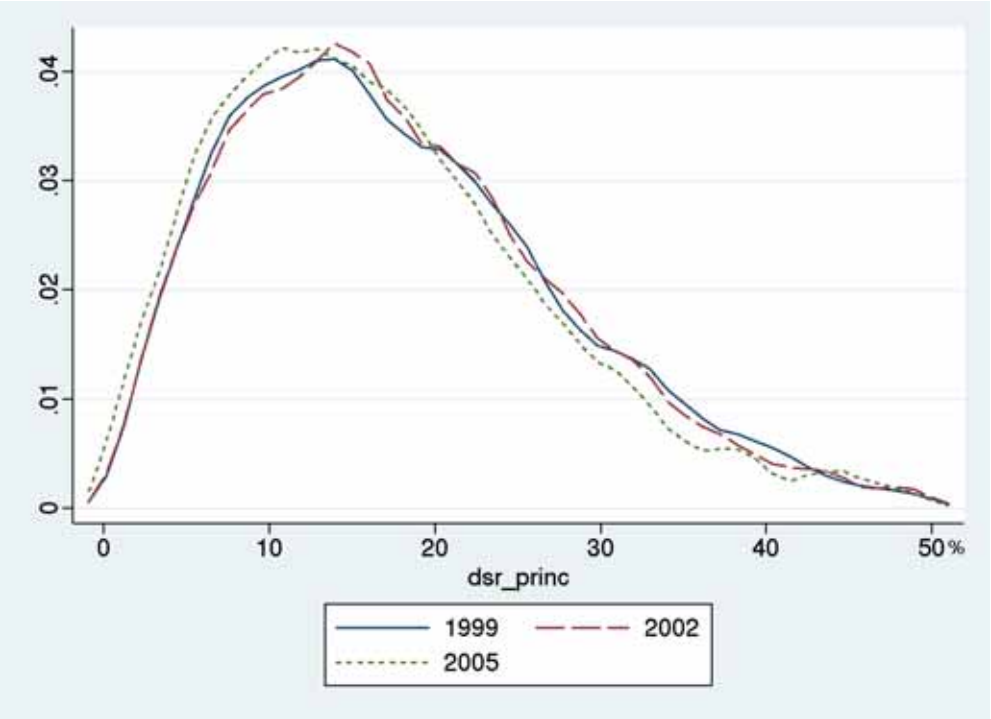
Figure 5 plots the distributions of the IP-DSR (all households with positive debt balance) for 1999, 2002 and 2005. From this graphic, it is clear that the shape of the distribution has remained largely unchanged since 1999.[32]

An analysis of the higher moments of the distributions confirms this observation: the variance, kurtosis, and skewness of the distribution are very similar across the years (Table 6).

[32] The same trend is depicted if we examine the distributions by income groups.

Figure 5

Distribution of the IP-DSR, selected years[1]



[1] Excludes extreme outliers and households with no debt.

Table 6

Moments of DSR distribution (by year)[1]

	Mean	Median	Variance	Skewness	Kurtosis
1999	17.77	16.27	98.96	0.65	2.94
2000	18.41	16.80	109.45	0.65	2.90
2001	18.33	16.80	104.52	0.63	2.92
2002	17.72	16.32	96.73	0.66	3.07
2003	17.85	16.44	99.16	0.67	3.05
2004	17.11	15.38	98.91	0.79	3.36
2005	16.69	15.28	94.89	0.76	3.32

[1] Moments of the conditional distribution (debt > 0 and excluding extreme outliers) of the IP-DSR.

However, while the higher moments of the distribution have not changed much over the last six years, the mean of the IP-DSR has decreased. Lateral shifts are important to our analysis as they influence the density of households in the 'vulnerable' tails of the distribution.

5.2 Density of households in "vulnerable" tail of the DSR distribution

One reason that the distribution of the DSR is of interest to policy makers is that it provides information on the proportion of households that are in a high-risk situation, i.e. households that are (relatively more) vulnerable to economic and other types of shocks. While there is no

universally accepted definition of the threshold for vulnerable tails of the DSR distribution, two commonly used thresholds are DSRs of 30 and 40 per cent.

The first threshold value is based on work by DeVaney (1994) who uses U.S. household data and probit analysis to show that having an IP-DSR greater than 30 per cent is an important determinant of future insolvency for a household. The second threshold (IP-DSR of 40 per cent) is based on anecdotal information from our Canadian bank contacts. Financial institutions often use the 40 per cent threshold to determine whether or not to extend credit to borrowers. One issue with the first threshold (IP-DSR of 30 per cent) is that it is expressed as a ratio to disposable income, whereas our IP-DSR measure from CFM uses gross income.[33] Since disposable income (on average) is about 75 per cent of gross income,[34] we can scale this threshold accordingly: the 30 per cent threshold is transformed into 23 per cent. In our analysis we use the scaled value of the thresholds and show the results using both the 23 and 40 percent thresholds as a sensitivity check on the results.

An examination of the density of households in the vulnerable tail of the IP-DSR distribution shows that this number has either remained roughly unchanged (IP-DSR 40 per cent) or decreased (IP-DSR 23 per cent) since 1999 (Table 7). These results are not entirely surprising as the shape of the DSR distribution has not changed since 1999 while the distribution has shifted to the left (i.e. the mean has decreased).

Table 7

Density in vulnerable tail (by year)[1]

	Households with debt >0		All households	
	DSR > 40%	**DSR > 23%**	**DSR > 40%**	**DSR > 23%**
1999	2.6%	29.3%	1.6%	19.3%
2000	4.6%	31.2%	2.9%	21.0%
2001	3.9%	30.6%	2.6%	20.7%
2002	3.0%	28.4%	2.0%	18.5%
2003	2.8%	29.2%	1.6%	18.3%
2004	3.6%	26.4%	2.1%	16.1%
2005	2.6%	25.1%	1.5%	15.3%

[1] Based on the kernel density estimate of the DSR distribution.

Table 8 shows that the density in the vulnerable tail by income groups. One thing to note is that the results become less robust as the sample size decreases as in the case of the vulnerable density of households by income groups above the 40 per cent IP-DSR threshold. For this reason we focus more on the 23 per cent IP-DSR threshold in Table 8. The right-hand side of the table shows that density of households with an IP-DSR greater than 23 per cent has fallen for both the low and middle income groups since 1999. This is especially apparent for the low-

[33] The 40 per cent threshold is based on gross income and thus does not suffer from this problem.

[34] Based on aggregate data from Statistics Canada's National Balance Sheet Accounts (2005); average for 1999-2005. This is, of course, a simplification of reality as the wedge between gross and disposable income may vary across income groups.

income households, which have the highest density in the vulnerable tail. Meanwhile, the vulnerable tail density for high-income households has remained roughly unchanged.[35]

Table 8

Density in vulnerable tail (indebted households)[1]

	IP-DSR >40%			IP-DSR >23%		
	Low	**Middle**	**High**	**Low**	**Middle**	**High**
1999	5.6%	2.3%	0.7%	37.7%	32.7%	19.0%
2000	8.8%	4.0%	2.0%	39.1%	34.5%	20.3%
2001	7.3%	4.1%	2.2%	37.0%	36.4%	20.2%
2002	7.0%	2.7%	1.1%	33.7%	32.9%	20.8%
2003	5.6%	2.7%	1.3%	39.7%	32.9%	21.0%
2004	7.1%	4.0%	1.5%	32.9%	31.3%	18.9%
2005	5.2%	2.7%	1.4%	32.8%	29.7%	19.4%

[1] Based on the kernel density estimate of the DSR distribution.

Summary

The analysis of the DSR distribution yields the following main results:

- The distribution is asymmetric with a thin, long right-hand tail.
- There has not been any noticeable change in the shape of the distribution since 1999.
- The density of households with a high DSR has fallen since 1999, particularly for the low income group.

Overall, the findings from the distributional analysis of the DSR suggest that Canadian households have fared quite well over the 1999-2005 period even as the sector (as a whole) accumulated debt at a strong pace.

6. Conclusions and future work

An analysis of household indebtedness based solely on aggregate data may be misleading as the aggregate data can mask important information about the distribution of the debt service burden across households. Our examination of the distribution of the DSR across Canadian households for the 1999-2005 period shows that the messages coming from the aggregate and micro data are consistent: household debt burden has fallen over recent years and household financial health remains sound. In particular, debt and asset holdings of households are relatively well matched, the distribution of the IP-DSR is skewed to the left and the shape of the distribution has remained roughly unchanged since 1999.

[35] The qualitative conclusions are the same if we examine the densities for all households, instead of only those with positive debt (as shown in Table 8).

However, it remains important to continue monitoring the distribution of the debt burden, in conjunction with the analysis of the aggregate DSR for households. It is probable that discrepancies between the aggregate DSR and the distribution of the debt burden become more apparent prior to or during periods of asset price misalignment, and other negative macro events. More years of data will be able to provide better insight into this.

Future work on this topic will focus on developing a framework for using the distribution of the DSR for policy analysis simulations. For example, we would like to ascertain how the DSR distribution would behave in response to a monetary policy or an income shock. In addition, we will also construct an aggregate measure of the household debt burden, which includes principal repayment obligations. The aggregate and micro-data based DSR measures will continue to play complementary roles in the Bank of Canada's analysis of household debt.

Appendix 1: Comparing the IO-DSR from CFM with the aggregate IO-DSR

One check on the quality of the CFM data is to see how well the DSR measure based on these data compares with the measure based on aggregate data. Since the aggregate DSR measure is an interest only measure, we focus on comparing it with the IO-DSR measure from CFM.[36]

The IO-DSR from CFM is calculated using information on the household's loan balances and the corresponding interest rates on the loans:

$$IO-DSR_{t,j} = \frac{\sum_i r_{i,j,t} \times loan\_bal_{i,j,t}}{GI_{t,j}} \quad (3)$$

Where:

'*i*' = mortgage loans, personal lines of credit, auto loans, outstanding credit card balance, other personal loans,

'*j*' = household ID,

'*r*' = annualized interest rate on loan as reported by each household,

'*loan_bal*' = outstanding loan balance, and

'*GI*' = gross household income.

The aggregate IO-DSR is estimated as described in *Section 2* of the paper and uses information on the effective interest rate on debt from CFM. The main difference between the aggregate and CFM IO-DSR is, therefore, the debt and income data used in calculating the ratio.

The aggregated IO-DSR from CFM (for all households, including those with zero debt) compares well with the estimate from aggregate data. In particular, both measures show a similar trend of declining debt service burden since 1999 (Figure 4). There is, however, a level difference between the two estimates. Possible reasons for this difference include:

1. the coverage of the debt data: CFM debt levels would be necessarily lower than the aggregate data, given that the aggregate data also include loans to un-incorporated businesses, and
2. the two measures use different denominators in their calculations: the aggregate IO-DSR measure uses disposable income while the CFM based measure used gross. Gross income is (on average) higher than disposable income.

Both these factors would lead to a lower estimate of the IO-DSR from CFM than from the aggregate data. Other factors that could lead to discrepancies between the two estimates include range coding of loan balances and gross income in CFM.[37]

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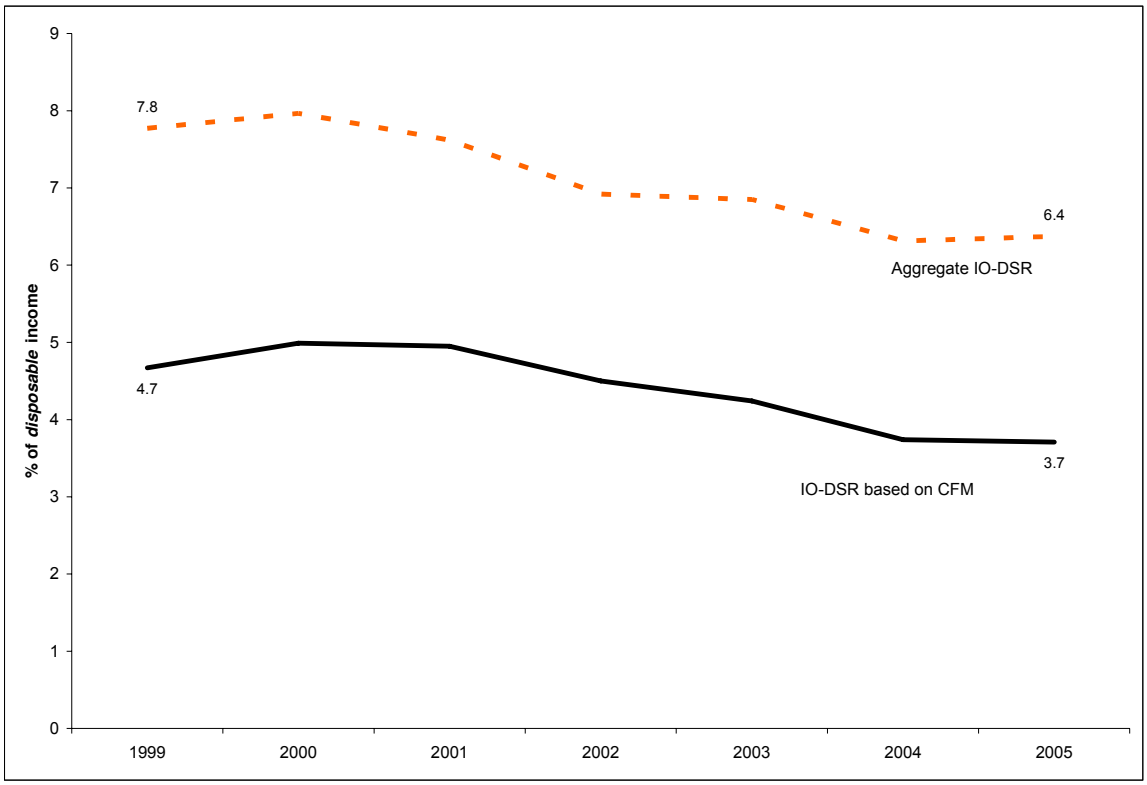
[36] CFM allows calculation of both the IO and IP-DSRs.

[37] Loan balances and household income are recorded as ranges and not as a point estimate. For example if household 1 and 2 have gross incomes of $35,001 and $44,001 respectively, they will both fall into the $35,000-$44,999 income group and for our calculations will have an estimated gross income of $40,000. This may lead to some noise in the CFM estimate.

Figure A1

IO-DSR calculations: micro and aggregate data



Sources: Statistics Canada, CFM and our calculations.

Appendix 2:
IO- and IP-DSR measures from CFM

CFM allows calculation of both the IO- and IP-DSR for households. Both ratios use gross income in the denominator. The calculation of the IP-DSR for each household is shown by equation 2 in section 5, while the IO-DSR for each household is estimated as follows:

$$IO-DSR_{t,j} = \frac{\sum_i r_{i,j,t} \times loan\_bal_{i,j,t}}{GI_{t,j}} \qquad (4)$$

Where:

'*i*' = mortgage loans, personal lines of credit, auto loans, outstanding credit card balance, other personal loans,

'*j*' = household ID,

'*r*' = annualized interest rate on loan (as reported by the respondent),

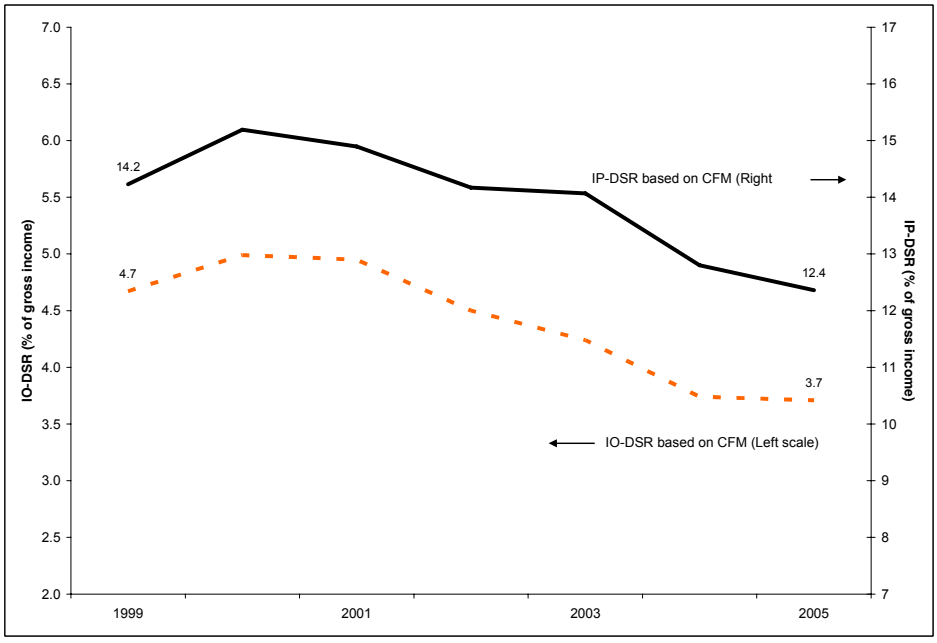
'*loan_bal*' = outstanding loan balance, and

'*GI*' = gross household income.

Figure A2 shows that both the IO- and IP-DSRs calculated from CFM[38] suggest a declining debt burden for Canadian households over the 1999-2005 period.

Figure A2

IO- and IP-DSR from CFM (1999-2005)



[38] The DSR estimates in figure A2 are estimated as follows. First, a DSR is calculated for each household. The mean DSR is then calculated for each year using CFM weights to aggregate across households. The estimates include all households (for a given year), including those with no debt (i.e. DSR = 0).

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Income structure and income distribution of China

Shi Dong[1]

Introduction

In China, the National Bureau of Statistics (NBS) is mainly responsible for income survey and statistics. There are income surveys of urban households and rural households.

Data on the income of the urban households come from the data collected through sample surveys on the urban households conducted by the Urban Socio-economic Survey Organization, of the NBS. The survey includes the size of the household and its composition, the cash income and expenditure of the household, the quantity of, and the expenditure on major commodities purchased, the employment of the household members, the housing condition and the possession of the durable consumer goods.

The survey on the urban households covers all households in urban areas and county towns. It is conducted in such a way that households selected by sampling method keep accounts for three successive years and are interviewed by the enumerators. By a rotational sampling scheme, one third of the old sample households are being replaced by the new sample households every year until the total sample size reaches over 50,000 households. Data on the income of the rural households come from the data collected through the sample survey on the rural households, which is organized by the Rural Socio-economic Survey Organization, of the NBS. The main content of the survey includes the basic condition of the rural households, the per capita total income and net income, the expenditure on housing, other consumption expenditures, the consumption of major consumer goods and the quantity of durable consumer goods owned.

The sample survey on the rural households is conducted by first selecting sample villages and then selecting households in the selected villages in each province, with all rural households in the province as the population for the sample. A combination of various sampling approaches are used to identify a total of 68,000 households selected from 7,100 villages throughout the whole country

It is required that the sampling error should not exceed ±3%, with a confidence interval of 95%. In order to ensure the accuracy of the data of the survey on the rural households, two accounts are designed for the respondent households by the Rural Socio-economic Survey Organization, NBS, the cash account and the account on goods in kind. Nearly 10,000 assistant enumerators have been invited to help the households to keep good accounts and check and tabulate the data of the survey.

In order to reduce the burden for the respondent households in doing this additional account keeping, as well as to address the problem of aging samples, to make the sample more representative of the population, to reflect the rural social and economic situation more accurately and in a timely way, a rotational sampling scheme is implemented by the Rural Socio-economic Survey Organization, of the NBS. The cycle of complete rotation is five years.

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[1] People's Bank of China.

Income structure of urban households

Through urban household survey and rural household survey, data on aggregate income per household and persons per household are collected and per capita income is calculated. Based on these calculations, the household income can be grouped into two categories, income of urban households and income of rural households.

Income of urban households includes:

- total income of urban households and per capita income of urban households
- disposable income of urban households and per capita disposable income of urban households

Income of rural households includes:

- total income of rural households and per capita income of rural households
- net income of rural households and per capita net income of rural households

Income distribution by type and source

The total income of urban households can be further classified as:

- Income from wages and salaries
    1. salaries and allowances
    2. compensation other than regular salaries and allowances
- Net income from management
- Income from property includes:
    1. interest income
    2. bonus stock and bonus capital
    3. insurance premium income
    4. income from other investments
    5. income from rent
    6. intellectual property income
    7. other income from personal property
- Transfers
    1. pension or retirement compensation
    2. social welfare payments
    3. compensation for dismissal
    4. other compensation
    5. income from unemployment insurance
    6. income support
    7. donations
    8. food compensation from families and friends
    9. accumulated savings drawn for housing
    10. sample household subsidy for keeping dairies
    11. other transfer income

Disposable income of urban households

Disposable income of urban households refers to the actual income which can be used for final consumption, other non-compulsory expenditure and savings. Disposable income is calculated using the following method:

Disposable income = total household income – income tax – personal contribution to social security – sample household subsidy for keeping dairies

Income structure of rural households

The total income of rural households includes:

- Wage income
    1. wages for labor provided to non-enterprise organizations
    2. wages for labor provided locally
    3. wages to local residents for labor provided to other regions
- Household business income
    1. agricultural income
    2. non-agricultural income
- Property income
- Transfer income

Net disposable income of rural households

Net income of rural households refers to the total income from all sources minus all corresponding expenses. Net income is calculated as:

Net income = total income – household operational expenses – taxes and fees – depreciation of fixed assets for production – subsidy for participating in household survey – gifts to non-rural relatives

Changes in income composition and levels in recent years

1. Income of urban households

The growth rates for urban household income were relatively high in recent years. The composition of income has also changed during this period.

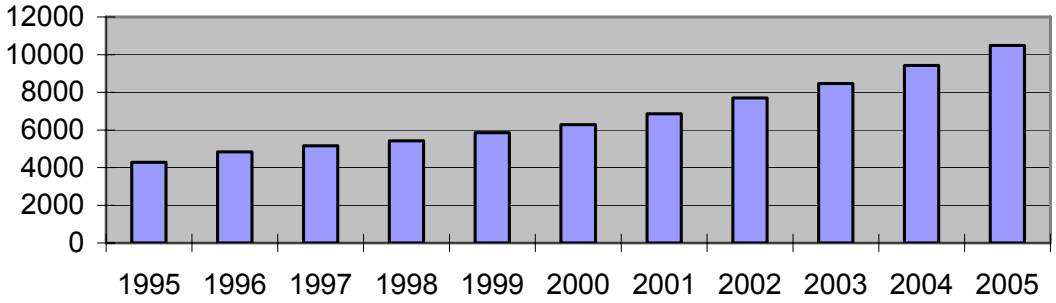
Rapid economic developments in recent years resulted in relatively high income growth rates for urban households. In 2005, per capita annual disposable income of urban households reached 10,493 yuan, which was the first time when the figure exceeded the 10,000 yuan mark. This was 4,213 yuan more than the per capita disposable income of 2000, which was 6,280 yuan. In real terms, the income grew by 58.3% cumulatively over the five years.

The composition of income for urban households has changed as well. The weights of wages and salaries and property income categories has declined while those of net income from management and transfer incomes has gone up. In 2005, wages and salaries accounted for 68.9% of total urban household income, which was 2.3% lower than in 2000. The share of net income from management was 6.0%, which was 2.1% higher than in 2000 while the

share of the property income at 1.7%, was 0.3% lower than in 2000. The share of transfer income was 23.4% in 2005, which was 0.5% higher than in 2000.

Disposable income changes of urban households

Unit: yuan



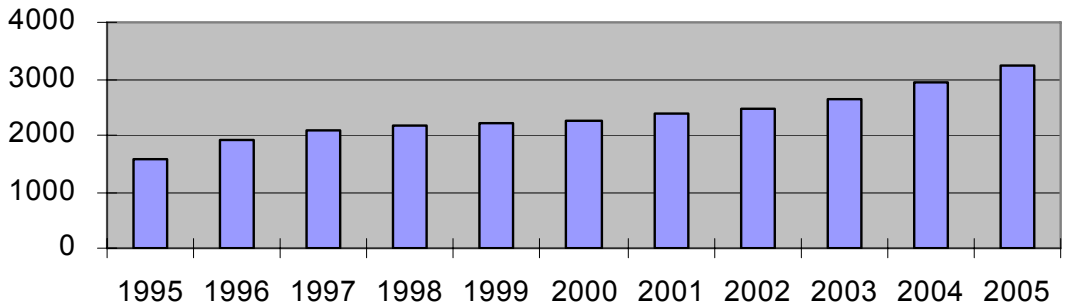
2. Income of rural households

Net Income of rural households continued to grow rapidly, going up from 2,253 yuan to 3,255 yuan between 2000 and 2005, which amounted to a 1002 yuan increase, and was equal to a 44.4% increase cumulatively. The average growth rate of net incomes was 7.6% per year during this period, and in real terms, incomes grew by about 5.2% annually.

The composition of the increase in rural households' income indicated that wage increase was the main source of the growth. In 2005, per capita annual wages income reached 1,175 yuan, which is a 473 yuan rise compared to 2000. Such increase s accounted for a 47.2% of the total increase in net income of rural households. In 2000, the share of per capita wage income was 31.2% of the annual net income, and it has gone up to 36.1% in 2005, an increase of 4.9%. In addition, the subsidy income of rural households increased greatly while their tax burden decreased sharply. During the two years of 2004 and 2005, the average per capita subsidy income of farmers was 34 yuan, which included grain subsidy, subsidy for better breeding and purchase and renovation of large-scale agricultural machines and appliances. The per capita tax burden of rural households decreased from 96 yuan in 2000 to 13 yuan in 2005, whose proportion in average per capital net income decreased from 4.2% in 2000 to 0.4% in 2005.

Pure income changes of rural households

Unit: yuan



Session 6

Panel on using household surveys to gather information on household finances

Chair: Coen Voormeulen
Netherlands Bank

Papers:

Lessons from the Spanish survey of household finances
Cristina Barceló and Olympia Bover, Bank of Spain

Designing and implementing a nationwide survey for the production of quarterly GDP series in Nigeria
C M Okafor and S N Essien, Central Bank of Nigeria

The household survey and monetary policy in Indonesia
Wijoyo Santoso and Aldrina Kusuma Sarie, Bank Indonesia

The financial position of households after a macroeconomic crisis: the case of Argentina
Horacio Aguirre, Central Bank of Argentina

The use of micro-level data from the Bank of Italy's survey of household income and wealth: a focus on household finance
Claudia Biancotti and Giovanni D'Alessio, Bank of Italy

Lessons from the Spanish survey of household finances

Cristina Barceló and Olympia Bover[1]

1. Introduction

To assess the financial behaviour and the situation of different types of families aggregate levels are not enough and we need to know the distribution of real and financial assets of households, their debts, and their relationship with other variables. Tax records, even if available, do not contain information on many of the relevant variables and the only way to analyze many of these issues is to get information from surveys to households.

In Spain, the first of such surveys was carried out in 2002 by the Banco de España. In this paper we review the main challenges and features of the Spanish Survey of Household Finances (EFF) 2002. More details can be found in Bover (2004) and Barceló (2006).

The paper is organized as follows. Section 2 describes briefly the making of the questionnaire. In Section 3 the sample design is discussed, particularly how oversampling by wealth is achieved while preserving stringent tax confidentiality requirements. Section 4 presents for the EFF 2002 the problems of unit and item non response, usually faced in wealth surveys. Section 5 explains the need to provide imputations and motivates the imputation methods used. Section 6 describes the actual imputation work involved in the EFF. Finally, Section 7 concludes.

2. Questionnaire

Information is collected on: demographics, real assets and their associated debts, other debts, financial assets, pension plans and insurances, labour market situation and labour income (for all household members), non-labour income in previous calendar year, means of payments, and consumption and savings.

When designing the EFF questionnaire, the examples of wealth surveys questionnaires from other countries were important inputs that were adapted to suit the Spanish situation. One important consideration all along the making of the questionnaire was to try and keep the total length of the interview to an hour on average.

This survey is the only statistical source in Spain by which it is possible to relate incomes, assets, debts and consumption at the household level. Linking the EFF data with other data sources (e.g. register data) is ruled out by our pledge of anonymity to households which we feel is important in order to convince them to participate in such survey.

[1] DG Economics, Research and Statistics, Bank of Spain.

3. Designing the sample

One distinctive characteristic of the EFF, following the example of the SCF in the US, is that there is oversampling of wealthy households. The distribution of wealth is heavily skewed and moreover some types of assets are held only by a small fraction of the population. Therefore, it was judged important to have a sample that would be not only representative of the population but also of aggregate wealth and that would also facilitate the study of financial behaviour at the top of the wealth distribution. This oversampling was achieved thanks to the collaboration of the Tax Office and the Statistics Office.

Basis for oversampling of the wealthy

In Spain there is a wealth tax ('Impuesto sobre el Patrimonio') and it is on the individual wealth tax files information that the EFF oversampling is based. People liable to the wealth tax in Spain were, in 1999 (which was the tax year used in selecting our sample), those with taxable wealth over 104,000 €. In 1999 around 980,000 individuals filed a wealth tax return. This corresponds approximately to 700.000 households, i.e. around 5% of the household population. We defined eight wealth strata which were oversampled progressively at higher rates.

Confidentiality guaranties

The Tax Office is subject to very stringent confidentiality requirements and cannot release, even to the Statistics Office, any personal tax information (not even in the form of intervals). To overcome the problem and enable wealth tax oversampling while preserving confidentiality, the National Tax Office volunteered to actually do the random sample selection herself following the sample design requirements, as instructed by the Bank of Spain and the National Statistics Office.

Thanks to the collaboration of both the Statistics Office and the Tax Office there is a unique population frame for the sampling. The population frame for the sample was the Continuous Municipal Census dated mid-2001, where the units are the households as defined by their address. With this information sent by the Statistics Office to the Tax Office, the Tax Office constructed for each address three variables based on information from both the wealth and the income tax. These data were the starting point for the sampling.

The first variable, the wealth stratum indicator, is based on total declared taxable wealth for the household, which was obtained by adding up the returns of all its members when applicable. The second one, for those filing income tax but not wealth tax, is a variable indicating to which quartile in the national taxable income distribution the household belongs. Finally, information on the per capita income of the household was also added. The income variables were helpful in the selection of sample replacements (as we shall see below), and to ensure that households from all income levels were selected into the sample. The latter was obtained by using systematic sampling with random start in a properly ordered data frame. Furthermore, the income quartile indicator was used to correct for non-response in large cities. The tax information available at the time was dated 1999. This entailed some limited mismatch between the two sources.

Sampling

The sampling design was different for the following three cases:

1. municipalities with more than 100,000 inhabitants. For large towns, the sampling was random within the eight wealth strata.

2. municipalities with 100,000 inhabitants or less. For small municipalities, the sampling was a two stage cluster design, with the primary sampling units (PSU or 'secciones censales') being selected first with probability proportional to their population. Further, within PSU the selection of households was different according to the number of wealth tax filers in the PSU.

3. Finally, in Navarre and the Basque Country where no oversampling of the wealthy was possible because the national Tax Office does not hold the personal tax file information for those regions, the sample was selected according to a two stage stratified cluster design with six strata defined according to municipality size.

Due to confidentiality reasons, stratum and cluster indicators cannot be provided. However, to calculate appropriate variance formulas replicate weights are provided instead.

Replacements

Another relevant aspect of the EFF sample design was the replacement scheme chosen. To try and preserve the oversampling scheme as much as possible, tightly controlled replacements were chosen. The use of controlled replacements is similar to post-stratification and weight adjustments done within cells when data collection is finished. An important advantage in our case for having controlled replacements was the fact that we do not have any indication of the wealth stratum to which the sample households belong so no 'directed' effort could be applied during the field work were we to discover that the response rate of certain strata was being particularly low.

In particular, up to four replacements were provided for each household originally in the sample that would serve as replacements of that household only. Those replacements were selected to be the two households immediately before and the two immediately after the household in a file ranked by income quartile (for non wealth tax filers), wealth stratum, and per capita household income. Replacements had to belong to the same income quartile (for non wealth tax payers) or the same wealth stratum as the sample household. This was done within municipalities in the case of large cities and within PSU in the case of small ones to keep replacements geographically not too distant from the original sample household. These implied that in some cases less than four replacements were available (and in a few instances, none at all). In the case of Navarre and the Basque country a more standard scheme of a pool of eight replacement households being potential substitutes for eight sample households (within the same PSU) was adopted.

Correcting for unit non-response and weights

To compensate for differential unit non-response, the sample weights are adjusted within the cells defined by the various sampling frame variables, including in particular wealth strata and income quartiles.

4. The fieldwork

Outsourcing the fieldwork

As it is usually done when Central Banks are responsible for wealth surveys to households, the Banco de España outsources the fieldwork for the EFF. The quality of potential fieldwork companies is a crucial factor for the good development of the survey. Unfortunately, in countries where major household surveys are conducted by the Central Statistics Offices, private fieldwork companies are mostly oriented towards opinion polls and marketing research.

Non-response

One of the characteristics of wealth and income surveys is high unit non-response due to the nature or the difficulty of the questions asked. The Banco de España was intensively involved in the efforts to reduce non-response, providing information to sample households and preparing written material.

Not possible to establish contact (never at home)

The number of households for which the interviewer was unable to find anybody at home (having confirmed with neighbours etc that the address corresponds to the household) is very high despite at least five attempted visits (see Table 1). The number of these failed contacts as a proportion of the total number of attempted contacts by wealth strata has some non-random component as we can see in Table 2. Multiple residences was perceived as a potential reason for failing to establish contact with high wealth people during the field work.

Refusal

As we can see in Table 2, there is a clear non-random component in cooperation rates [defined as completed/(completed+refused)], decreasing as we move up the wealth strata, ranging from 53.6% to 29.4%. It is clear from this pattern that overall cooperation or response rates are not very informative in case of oversampling since they are dependant on the degree of such oversampling. For some meaningful comparison, we constructed cooperation rates by strata for the 1992 SCF. These cooperation rates for the list sample ranged from 52.6% for stratum 1 to 20.1% for stratum 7.

Table 1

Number of attempted contacts, by type of response

Completed	5143
Refused	5722
Never at home	6670
Out of scope	
(wrong address, not a housing unit, empty dwelling, deceased, others out of scope)	1797
Discarded after supervision	569
Total	19901

Supervision and discarded interviews

All the completed interviews were first revised by the field work agency supervisors. A large proportion of the completed interviews were re-contacted (mostly by phone but some personally). There were various reasons for re-contacting: (i) check potential inconsistencies, (ii) confirm all extreme values, and (iii) reduce item non-response.

A program was developed to detect logical inconsistencies between questions. Households sometimes provided a plausible explanation for them. For example in some cases the reference person in the household appeared as born after their main residence was bought because of having inherited that residence. However, in many cases this was useful to detect errors.

Table 2

Some measures of non-participation, by wealth strata

	Never at home[1]	Cooperation rate[2]
Total	33.5%	47.3%
Stratum 1	31.0%	53.6%
Stratum 2	38.9%	45.3%
Stratum 3	32.9%	44.7%
Stratum 4	35.5%	46.5%
Stratum 5	37.0%	38.5%
Stratum 6	38.0%	36.1%
Stratum 7	40.1%	37.8%
Stratum 8	39.8%	29.4%
Navarre and Basque Country	26.0%	46.0%

[1] Defined as (Never at home/Total attempted contacts) [2] Defined as [Completed/(Completed+Refused)]

Aside from the previous reasons, there was also extensive random re-contact to further control the work of the interviewers.

The EFF team at the Banco de España also examined the completed interviews for overall individual coherency. The process of validating the interviews is considered to be highly necessary to achieve a reliable dataset.

The degree of oversampling in the final sample

Finally, in what follows we give some figures about the degree of oversampling in our final sample. These were kindly provided by the Tax Office due to the confidentiality restrictions. Overall, slightly over 40% of the households that completed the interview correspond to wealth tax filers. Furthermore, aggregate tax returns information indicates that four per thousand of the population of households hold 40% of total taxable wealth. We would therefore expect to have at most 20 of such households in a 5,000 random sample, an upper bound since it assumes non-differential rate of response. In contrast, our sample contains over 500 of them.

5. Rationale behind imputation[2]

Item non-response

Item non-response occurs when a household agrees to participate in the survey but fails to respond to one or more questions. Together with high unit non-response, item non-response

[2] The references for this section (except the last part) are Little and Rubin (1987), Rubin (1987), and Schafer (1997).

is an inherent characteristic of wealth surveys. Moreover, they are closely related. Indeed, item non-response will partly depend on the stringency of the conditions imposed (in terms of the amount of important questions having to be completed) to declare valid an interview which in turn affects unit non-response rates. This is an issue one has often to address at early stages since it may affect the terms of the contract with the field agency. In particular, there is a trade-off because stringent conditions would give the right incentives to the interviewers but would produce self-selection into the sample in addition to the one created by overall refusals to participate. Moreover, faced with too stringent conditions the interviewers are more likely to cheat or to induce answers from the household.

Answers to the questions on whether the household holds a particular asset are usually readily provided. In contrast, households may have experienced more difficulties in providing information about the value of the asset held or about the amount of a particular income source. In Table 3 we present non-response rates to some key questions.

Why impute

Given the item non-response rates reported above, working with only the available cases ignoring item non-response would not be sensible. First, this would assume that the complete cases are a random subsample of the original sample. This is most probably not valid (as we have seen, for example, in the case of unit non-response), and therefore such an analysis could induce severe biases in the results. Second in multivariate analyses, working with only the observations for which all the variables of interest are completed would lead to far too small samples.

- *Imputation for enabling the analysis of the EFF with complete-data methods.* Correct inferences from an incomplete data set can be made using for example model based maximum likelihood methods. However, this is not technically available to all potential users of the data. Therefore, it is beneficial to provide users of the data with some imputation of (i.e. 'filling in') the missing data, which of course analysts are free to ignore[3]. Imputation is not meant to create artificial information or to give the impression that the data set contains more information than it actually has, but to exploit exhaustively the existing one in a way to enable the various possible analyses of the data using complete data tools.
- *Imputation as a responsibility of the data provider.* Imputation is a resources consuming process which is not at the disposal of most users and is sensibly thought to be the data provider's responsibility [see Rubin (1996)]. An additional reason, very relevant in the case of the EFF, for the Banco de España to provide imputation is that we have access to some information (like some stratifying and location variables) relevant for imputing sensible values which will not be available in the public data file for confidentiality reasons.

[3] All imputed values are flagged accordingly.

Table 3

Reporting rates (%) of various items, unweighted sample

	Have item		Value for those having the item		
	Yes	**Unknown**	**Value**	**DK**	**NA**
Own main residence	84.5	0.0	86.5	13.0	0.5
Amount owed, 1st loan, main residence	15.0	0.0	88.6	11.2	0.3
Monthly payment, 1st loan, main residence	15.0	0.0	96.2	3.5	0.1
Rent main residence	9.9	0.0	97.4	1.0	1.6
Other real estate, 1st property	41.7	0.0	82.0	16.4	1.0
Amount owed, 1st loan, 1st other real estate	5.0	0.0	91.1	6.6	0.8
Accounts usable for payments	96.9	1.5	74.3	11.7	14.0
Accounts not usable for payments	20.8	2.2	81.8	6.5	11.8
Listed shares	20.7	0.3	76.6	15.9	7.4
Unlisted shares	6.9	0.2	51.3	34.6	14.2
Mutual funds, 1st fund	14.7	0.2	76.6	12.8	7.5
Fixed income securities	3.3	0.2	81.4	11.0	7.6
Pension plans, 1st plan	25.8	0.0	62.3	34.6	3.0
Life insurance (1st policy) coverage	8.9	0.0	63.9	33.5	2.6
Business market value (reference person)	13.1	0.0	64.3	32.3	3.4
Wage income (reference person, 2001)	36.9	0.0	97.6	1.2	1.3
Self-employment income (ref. person, 2001)	13.4	0.0	89.6	5.2	5.2
Unemployment benefits (ref. person, 2001)	1.5	0.0	94.7	5.3	0.0
Pensions (reference person, 2001)	31.8	0.0	99.2	0.2	0.6
Income from real assets (2001)	11.1	0.1	92.0	3.3	4.7
Income from dividends, coupons, etc (2001)	9.3	0.9	60.7	33.4	5.9
Bank accounts interest income (2001)	65.1	3.6	34.1	60.5	5.4
Food expenditure	100.0	0.0	93.8	5.8	0.4
Non-durable expenditure	100.0	0.0	95.9	3.6	0.5

Choice of imputation method

Before explaining our choice of imputation method we should say that they all rely on the *missing at random* (MAR) assumption [as defined in Rubin (1976) and in Little and Rubin (1987)]. This requires that the missing values behave like a random sample of all values but within groups defined by observed data. The goodness of this assumption will depend on the availability of observed variables which could plausibly explain missingness and conditional upon which the analysis can be conducted.

One of the central motivations for launching the EFF was to learn about the distribution of the real and financial assets of households, their debts and their relationship with other variables. To preserve the observed distribution of variables and the covariances between them, stochastic imputation methods should be used. Indeed, simple methods like mean imputation (conditional or unconditional) tend to produce peaked distributions of the variables and underestimation of the variances.

A very popular method of stochastic imputation is *hot deck*, with some variations. In general, with a hot deck procedure the missing item for a given household would be replaced by the value of the item reported by some similar-in-characteristics household. However, in the case of the EFF the number of characteristics/variables upon which one would like to condition, before being sensible to assume that the missing information is missing at random, is too large to produce reasonably sized cells from which to draw the hot deck imputation. Therefore, most of the EFF imputations, as we will see later, are based on random regression type models.

Finally, to take into account uncertainty about the imputation under the considered model and additional potential uncertainty when more than one model could be chosen for imputation, we provide multiple imputations (MI), as proposed by Rubin (1987).

Software used for imputation

We have been very fortunate to be allowed to use the programs written at the Board of Governors of the Federal Reserve System by Arthur Kennickell [see Kennickell (1991 and 1998)] for the SCF multiple imputation, as well as to benefit from his advice.

The multiple imputation procedure is based on the data augmentation algorithm and Markov chain Monte Carlo method and has an iterative and sequential structure [see Tanner and Wong (1987) and Schafer (1997)].

- *Iterative process:* The iterations of the imputation process are split into two steps. In the first step, missing data are imputed using the previous-iteration estimates of the parameters of the complete data distribution according to our imputation models. In the second step, we estimate the parameters of the imputation models using the observed data and the missing values previously imputed in the first step, in order to use these updated estimates for imputing missing data in the next iteration of the imputation process. Once the imputation process ends one iteration, another iteration starts repeating both steps until the convergence of this process.
- *Sequential process:* Within the same iteration of the imputation process, these two steps are repeated sequentially for imputing each one of the survey variables having missing information. The order in which the variables are imputed sequentially is not innocuous, mainly when we have missing information in the covariates of the imputation models. The imputed values are sequentially used to impute the subsequent variables with missing information. For this reason, in the EFF data we start imputing those variables not having a high fraction of missing information and those variables we consider to be very good predictors of the remaining variables to be imputed.

The programs for the SCF multiple imputation impute continuous variables stochastically using linear regression models. The imputation is not based on more complex models, since the linear regression models allow us to accommodate very easily a huge number of different patterns of item missingness across households. When we do not have available previously imputed values of the covariates with missing information, we need to impute values as if we implement different linear imputation models for each household depending on its non-missing covariates in the imputation model. Linear regression allows us to take advantage of reshaping easily and rapidly the variance and covariance matrices among the non-missing covariates and the variable to be imputed, depending on the particular pattern of item missingness in the covariates for each household with missing information on the variable to be imputed. In this way, we save enormous costs in terms of time and effort, since we must take into account a large number of covariates in the imputation models (from 100 to 200 depending on the sample size) and we must handle a huge number of different patterns of item missingness.

Binary variables are imputed using linear probability models in order to take advantage of the linear regression models for the reasons explained above. The imputation of multinomial variables is made using hot deck procedures.

Finally, the SCF imputation programs allow us to restrict the imputed values of missing data to one upper and one lower bound specific to each observation. These upper and lower bounds are constructed using the information provided by the EFF survey or previously imputed, whereby we can maintain consistency between the observed data and the imputed values of the missing information in the survey.

6. Imputation work in the EFF

This section describes how the actual imputation was carried out in the EFF, a process that has to be adapted to a large extent to each specific questionnaire and survey implementation.

Logical trees and shadow values of the EFF data

Before starting to impute the data, we have to create the flags of all variables and observations of the EFF data. These flags give information about whether or not the values provided have been answered by the households and also show the reason why the values are missing. In addition, these flags also indicate whether the existing missing values in variables are really *true missing values* or whether they have been imputed as “true missing” during the imputation process. The different values that these flags take for indicating the data origin and the reason for item missingness are called *shadow values*.

The task of constructing the flags and assigning the shadow values is carried out in two stages: in the first stage, we convert the different codes of “don’t know” and “no answer” responses (DK and NA responses) into missing values and assign their shadow values. In the second stage, we need to specify and program all the potential and logical relationships among the variables of the EFF questionnaire, so that we can assign the shadow values correctly to all observations and variables, mainly to those having either true missing values or item missing values derived from the household non-response to a previous related question.

The logical relationships that exist among the EFF variables are grouped in *logical trees* of variables; in each tree, one variable is the *head-variable* and the remaining ones are *branch-variables*. The household response (or non-response) to one head-variable affects both the values and the shadow values of the branch-variables, since the value of the head-variable may involve true or item missing values and may restrict the values of the branch-variables according to the design of the EFF questionnaire.

The flags are constructed before the imputation stage, since the shadow values are continuously used to impute the missing data mainly due to two reasons. First, we only impute the variables whose shadow value exceeds a certain threshold; and second, the imputation stage relies greatly on all the logical trees established among the variables of the survey, since the order in which the variables are imputed and the way in which the head-variable determines the values imputed subsequently to its branch-variables are based on the existing logical trees.

The meaning and the total number of different shadow values are specific to the EFF survey and depend greatly on both the survey characteristics and its implementation. The SAS programming for assigning the shadow values is facilitated by the fact that the interviews were made by CAPI and the original data were previously inspected. A small list of variables has not been imputed, due to the fact that the fraction of missing information exceeds the 60%, the number of respondents is very small to impute suitable values or due to the fact the households have not generally understood the question very well.

Covariates of the imputation models in the EFF

The goal of imputation is not to replace the missing data by their best predicted values, but to preserve the characteristics of the data distribution and the relationships among the different variables of the survey, in order not to bias the potential analyses made using different statistics (means, variances, correlations, percentiles, etc.). Thus, we need to include a large number of covariates in the imputation models that may be classified into four groups: the first group of covariates is formed by the determinants of the non-response, in order to satisfy the assumptions of "missing at random" and "ignorable missing data mechanism". Some key covariates in this first group are the following: total household income; random wealth strata indicators; regional indicators; age and education of the family head and the partner; and information provided by interviewers, such as the indicators of the type of building, neighbourhood, social status, house quality, the respondent's degree of understanding and sense of responsibility in answering, etc.

The second group of covariates is formed by the variables that are very good at predicting and explaining the imputed values. We usually include total household income; non-durable consumption; indicators of the different types of assets owned by the households; and the amounts of wealth held in the most common assets in which households generally invest, such as the owner-occupied house, other real estate properties, stocks, mutual funds and pension schemes.

The third group of covariates is formed by the variables that we expect to affect or explain the variable to be imputed according to different economic theories, in order to preserve the existing relationships between these variables and not to condition or bias the estimates made by the potential users of the data.

Finally, the fourth group of covariates is formed by determinants or good predictors of the covariates included in the rest of groups of variables. The role of this group is very important, since variables are imputed sequentially using the observed values and the values of the previously imputed variables within the iteration. Thus, we may have missing information on some key covariates and we need other variables that predict or capture the explanatory power of the missing covariates appropriately. Depending on the sample size available to impute the variable of interest, we try to include a set of key variables as large as suitable. Some of the covariates in this group are the following: characteristics of the household composition and structure (number of children, the children's age, the household head's civil status, number of adults, number of adults broken down by their labour market situation, etc.) and personal characteristics of the family head and the spouse or partner (age, education, labour history, current labour status, type of work done, economic activity, etc.).

Specifications of the imputation models

Continuous variables

To take non-linearities into account, regressors may be either formed by interactions between variables or introduced in logarithms or as polynomials. To impute euro questions that allow zero values as a response, we first impute a binary variable indicating whether the imputed value is zero or not. The imputation models of continuous variables are usually based on their logarithm.

When we impute percentages, we first impute a categorical variable indicating whether the percentage value corresponds to one of the probability mass points observed in a histogram or which is the range of values defined by these probability mass points in which the percentage lies. Afterwards, we impute the logarithm of the percentage restricting its value to the range previously imputed.

Finally, we sometimes specify the imputation model for other continuous variable highly related to the variable of interest; in this way, the model makes more economic sense and has a greater explanatory power.

Multinomial variables

The imputation is done by hot deck procedures using two discrete covariates or one discrete and other continuous variable. We usually include income or age as a continuous variable or two covariates being the result of interactions among some variables, such as indicators of the random wealth strata, the total household income quartiles, the family head's age bands and education, and other characteristics specific to the variable of interest.

Questions asked separately to each household member over 16, each particular asset within an asset type, each job, etc.

The way of imputing these variables is to construct a pooling of subsamples defined for each household member, for each job, etc. First, we generate the covariates of the imputation model separately for each household member, job, etc., and then we pool all these subsamples to estimate the parameters of the imputation model over the pooled sample. The imputation of these types of question is a very time-consuming process in SAS.

Constructed total household income variables

As total household income is a key covariate in the imputation models for all variables of the EFF survey, total income is one of the first imputed variables. We construct two total household income variables: one corresponds to the earnings obtained in 2001 and the other to the income received in the month in which the interview took place during 2002 or 2003. The total income variables are constructed as the sum of all sources of income, the property income from all household's asset holdings and the labour and non-labour income earned by all household members. The imputation models impute higher total household income values when we impute total income variables than those obtained when total income is generated as the sum of the different income sources imputed individually and separately. This may be due to the fact that we have richer information for imputing the constructed variables of total household income and due to the fact that we have no information about the ranges in which each income source may lie when the respondents neither know nor answer the exact amount of income.

Multiple responses to one question posed

The EFF survey contains questions that allow the households to make multiple responses. The way of imputing these questions are also to pool subsamples defined for each one of the household's multiple responses and to impute by hot deck procedures.

Evaluating the imputation of the EFF data

We implement two procedures specific to the imputation of the EFF data to evaluate the imputed values of continuous variables to ensure reasonable starting values in the first iteration of the imputation process and to evaluate the convergence of the imputed data across iterations, mainly due to the fact that a part of the imputed value comes from the randomisation. The implementation of these two evaluation procedures are explained in Bover (2004) and Barceló (2006).

7. Conclusions

In this paper we have described the main issues faced in conducting the first wave of the Spanish Survey of Household Finances. In particular, (i) we have reviewed the considerations that prevailed when drafting the questionnaire, (ii) we have described the design of the sample with a special emphasis on how the oversampling of the rich was achieved, and (iii) we have reported on survey and item non-response and explained the imputation work involved.

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Designing and implementing a nationwide survey for the production of quarterly GDP series in Nigeria

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I. Introduction

Many countries have recognized the need for high quality data to guide macroeconomic and sectoral policies. Timely and reliable information/data is now regarded as an essential tool that enables governments, businesses, and citizens to make informed decisions. The importance attached to the production of quality and timely data can also be understood from the point of view that it assists in policy formulation, economic planning and monitoring as well as in the review of socio-economic developments in a country.

In Nigeria, the statutory responsibility for generating national statistics for the compilation of Gross Domestic Product (GDP) and other macroeconomic aggregates is vested in the National Bureau of Statistics (NBS), formerly the Federal Office of Statistics (FOS). To achieve this mandate, the NBS usually conducts surveys including annual, quarterly and other periodic surveys. However, due to the capital intensive nature of surveys and the limited resources available, the capacity of the Bureau to conduct comprehensive surveys for the production of quarterly GDP series for the country had over the years been limited. Moreover, poor funding of statistical activities by government had compromised data quality and made it difficult for a robust and self-sustaining statistical infrastructure to be built within the National Statistical System (NSS). The reduced priority for investment in statistics, inability to attract and retain qualified staff due to poor facilitation, motivation and remuneration, were other factors that had militated against statistical production in Nigeria. These developments had deleterious effects on statistical agencies in terms of sustaining capacity for statistical production and had led to user-despondency in the country.

To mitigate these difficulties, the NBS resorted to collaborative studies with other organizations, especially the Central Bank of Nigeria (CBN). The two institutions had collaborated in the past in areas such as the production of external trade statistics, the re-basing of Consumer Price Index (CPI), the survey of the informal sector, as well as the pilot survey of export commodities in Nigeria. In an initial effort to produce quarterly series, similar collaborations also took place between the CBN, the Nigerian Institute of Social and Economic Research (NISER) and the Centre for Econometrics and Allied Research (CEAR), both in Ibadan. At that time, the efforts were merely limited to the decomposition of annual into quarterly GDP series for Nigeria. There were no surveys conducted to capture live data for the generation of quarterly GDP series for the country.

Although the series generated earlier through the decomposition of annual GDP succeeded in filling some gaps, they were not quite adequate as the methodology adopted for the decomposition of some of the annual series relied on some subjective indicators.

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Unsatisfied with the results and confronted with the problem of non-availability of reliable quarterly GDP series for policy prescription and analysis, the CBN in 2005 collaborated with the NBS to undertake a comprehensive national survey of socio-economic activities in Nigeria. The key objective of the exercise was to collect primary data necessary for the production of quarterly GDP series, covering the period from the first quarter of 2004 to the second quarter of 2005. To achieve this objective, the two institutions decided to pull together their resources for the nationwide survey which was the first of its kind. Using the instrumentality of the National Integrated Survey of Households (NISH), National Integrated Survey of Establishments (NISE) and the System of Administrative Statistics (SAS), the multi-purpose survey covered the 36 states of the federation as well as the federal capital territory, Abuja.

In the past, the two institutions had relied on the output of surveys undertaken by each institution for the analysis of sectoral developments. The shortcomings of that approach had been the duplication of efforts, data conflicts and inadequacies in the area of coverage, precision, funding, scope and depth. The management of the two institutions therefore felt the need for synergy of efforts so as to optimize the financial, human and material resources available to the two institutions in order to thenceforth produce an acceptable national statistical output for the nation beginning from 2004.

The objective of this paper is, therefore, to describe the design and implementation of the survey, as well as evaluate its outcome in the context of meeting data needs, achieving quick-wins and charting a course of action for sustainability of the collaboration. The challenges, prospects and the way forward of generating credible national statistics through surveys are also discussed.

The rest of the paper is structured into eight parts as follows: Part II discusses the survey methodology adopted for the NBS/CBN collaborative survey, including the survey instruments, sample design and estimation techniques. Part III gives a detailed description of the field survey and the processes involved. In Part IV and V, the estimation procedure for the GDP is discussed as well as the report writing. In Part VI the modifications introduced to the survey are discussed, while the challenges and prospects of generating data from field surveys in Nigeria, are highlighted in Part VII. Part VI contains the recommendations and conclusion.

II. Survey methodology

II.1 Survey instruments

The survey instruments used were the questionnaires and instruction manuals. The instruction manuals were incorporated in the questionnaires for easy reference and to facilitate their completion. The survey instruments were jointly developed to meet the objectives of the survey and the requirements of the collaborating agencies. Thirty-seven questionnaires were developed: two for NISH, eight for NISE, 25 for SAS and one each for State and Local government statistics.

The questionnaires administered for the NISH were those used for General Household Survey and Private Farmers - adapted from the National Agricultural Sample Survey (NASS) questionnaire. The two questionnaires were administered at the household level.

The questionnaires developed for the National Integrated Survey of Establishments were variously focused on manufacturing; modern agricultural holdings; hotels and restaurants; building and construction; wholesale and retail trade; mining and quarrying; professional services and road transport operators. A questionnaire for farm gate and producer prices was administered to establishments engaged in manufacturing, mining & quarrying, and services. This was aimed at using the data for the construction of the producer price index.

The questionnaires administered under the System of Administrative Statistics (SAS) covered various sectors of the economy: education; water and sanitation; housing; finance; gas, oil and energy; electricity; labour; local government information services statistics; etc.

II.2 Sample designs

(i) National Integrated Survey of Households sample design

The collaborative survey employed the sample designs of three survey systems used by the NBS. The sample design for the General Household Survey (GHS) and the National Agricultural Sample Survey (NASS) derived from the 2000/05 NISH sample design developed by the National Bureau of Statistics (NBS). The NISH design employed a 2-stage, replicated and rotated cluster sampling design, that is, a technique by which many sample sites were selected independently from a population such that each replicate sample represents the population.

In the design, the enumeration areas (EAs) were selected as first stage sampling units or primary sampling units (PSUs), while the housing units constituted the second stage sampling units or secondary sampling units (SSUs). The housing units were the ultimate sampling units for the multi-subject survey.

In the GHS, a sample of 60 EAs was selected with equal probability from each state, while 30 EAs were selected from the Federal Capital Territory (FCT), Abuja. In each EA, a listing of housing units was undertaken, from which a sample of 10 Housing units (HUs) was selected systematically. Thereafter, all the households within the 10 HUs were interviewed using the GHS questionnaire.

Altogether, a sample of 600 Housing units was selected in each state, while the sample size for FCT, Abuja was 300. A national sample size of 21,900 housing units was selected, which was considered robust enough to provide estimates at national and sub-national (state) levels.

For the NASS (Private Farmers), 5 farming housing units (FHUs) were selected systematically after stratifying the housing units into farming and non-farming housing units, where all the holders within the selected farming housing units were interviewed using the private farmers questionnaire. A sample size of 300 farming housing units was drawn from each state and 150 from FCT, Abuja. A total national sample size of 10,950 farming housing units provided the estimates at the national and state levels.

Estimation procedures

Let the probability of selecting an EA be f_j and the probability of selecting a housing unit be f_k, then the product $f = f_j f_k = \frac{1}{W_{jk}}$ Where $f_j = \frac{n}{N}$ and $f_k = \frac{h}{H}$

1. For GHS:

$$\hat{Y}_s = \frac{N}{n}\sum_{j=1}^{n}\frac{H}{h}\sum_{k=1}^{h} X_{sj\,k}$$

$$= \frac{N}{n}\frac{H}{h}\sum_{j=1}^{n}\sum_{k=1}^{h} X_{sj\,k}$$

$$= W_{sj\,k}\sum_{j=1}^{n}\sum_{k=1}^{h} X_{sj\,k} \qquad \left(\text{Note} : W_{sj\,k} = \frac{N}{n} \bullet \frac{H}{h}\right)$$

Where $\hat{Y}_s$ is the State Estimate of the element in *k*th housing unit of the *j*th EA in the *s*th State.

N = Total Number of EAs in the *s*th State.

n = Selected number of EAs in *s*th State

H = Total number of Housing Units listed in the *j*th EA.

h = Selected number of Housing Units in the *j*th EA.

$X_{sj\,k}$ is the value of the element of HU in the *k*th housing unit of *j*th EA in the *s*th State.

$W_{sj\,k}$ is the weight of the element in the *k*th housing unit of the *j*th EA in the *s*th State.

2. For NASS (private farmers)

$$\hat{Y}_s = \frac{N}{n}\sum_{j=1}^{n}\frac{F_H}{m}\sum_{k=1}^{m} X_{sj\,k}$$

$$= \frac{N}{n}\frac{F_H}{m}\sum_{j=1}^{n}\sum_{k=1}^{m} X_{sj\,k}$$

$$= W_{sj\,k}\sum_{j=1}^{n}\sum_{k=1}^{m} X_{sj\,k}$$

Where $\hat{Y}_s$ is the State Estimate

N = Total number of EAs in the *s*th State

n = Selected number of EAs in *s*th State

F_H = Total number of farming housing units listed.

m = Selected number of farming housing units.

$X_{sj\,k}$ is the value of the element of farming housing unit (FHUs) in the *k*th housing unit of *j*th EA in the *s*th State.

$W_{sj\,k}$ is the weight.

3. National estimate

$$\hat{Y}_N = \sum_{s=1}^{37}\hat{Y}_s$$

where $\hat{Y}_N$ is the National Estimate and $\hat{Y}_s$ is the State Estimate.

4. Variance estimate (Jackknife method)

To estimate variances using the Jackknife method will require forming replicates from the full sample by randomly eliminating one sample cluster (EA) at a time from a State containing k EAs. *k* replicated estimates are formed by eliminating one of these, at a time, and increasing the weight of the remaining (*k* – 1) EAs by a factor of *k*/(*k* – 1). This process is repeated for each EA.

For a given State or reporting domain, the estimate of the variance of a rate, *r*, is given by

$$Var(r) = (Se)^2 = \frac{1}{k(k-1)}\sum_{i=1}^{k}(r_i - r)^2$$

where, (*Se*) is the standard error,

k is the number of EAs in the State or reporting domain.

r is the weighted estimate calculated from the entire sample of EAs in the state or reporting domain.

$r_i = kr - (k-1)r_{(i)}$,

where $r_{(i)}$ is the re-weighted estimate calculated from the reduced sample of $k-1$ EAs.

To obtain an estimate of the variance at a higher level, say, at the national level, the process is repeated over all States, with k redefined to refer to the total number of EAs (as opposed to the number in the States).

(ii) National Integrated Survey of Establishments sample design

The design of an efficient sample for the National Integrated Survey of Establishments (NISE) required a broad understanding of the sectors in the economy and practical experience in sampling techniques. The collaborative survey used the NBS 2004 frame of quick-listing and the CBN frame of establishments. The two frames were merged, cleaned and validated. A total of 2,171 establishments drawn from 8 sectors were covered and canvassed. A combination of parameters was considered in the allocation of establishments to each sector, state and employment band. These included the contribution of each sector to the GDP; the number of establishments in each sector by state; and the number of establishments in each employment band for each sector. Some establishments were allocated purposively based on a priori knowledge of the performance of the sector in the economy.

The estimation procedure

If the sample of 'n' establishments is allocated to each sector with probabilities proportional to their sizes (contribution to the GDP), say,

$$P_i = \frac{M_i}{M_o} \quad \text{and} \quad M_o = \sum M_i$$

then, the unbiased estimate of the population (all establishments) total is given by:

$$\hat{Y}_{pps} = \frac{1}{n}\sum_{i=1}^{n}\frac{y_i}{P_i}$$

and the estimate of the variance is given by:

$$V(\hat{Y}_{pps}) = \frac{1}{n}\sum_{i=1}^{n} P_i\left[\frac{y_i}{P_i} - \hat{Y}_{pps}\right]^2$$

The unbiased estimator of the variance of the above estimator is given by:

$$V(\hat{Y}_{pps}) = \frac{1}{n(n-1)}\left[\sum_{i=1}^{n}\frac{(y_i)^2}{(P_i)} - n\hat{Y}^2_{pps}\right]$$

(iii) System of Administrative Statistics (SAS) sample design

The design of the SAS survey involved complete coverage of the listed institutions and establishments. The 25 questionnaires for SAS operations covered all relevant agencies/institutions at the national, state and local government levels.

III. Field survey and processes

III.1 Work programme

As soon as the management of the CBN and NBS agreed to the collaboration, an experts working group was put in place to handle the collaborative efforts. A technical sub-committee was also appointed to produce a draft budget which was later ratified by the working group and approved by the management of the CBN. Under a sharing formula jointly agreed by the two institutions, the CBN, being the funding institution, was allocated 70 per cent, while the balance of 30 per cent was to be contributed by the NBS. However, to facilitate a smooth take-off of the survey, the CBN made available the entire sum of ₦54.1 million (about US$410,500), earmarked for the survey.

Also, a joint data production programme by the two agencies resulted in the scheduling of the 2005 half year survey activities between June and October, 2005. The work programme provided for the planning period, design of questionnaires and harmonization of the survey instruments by the two institutions, so as to accommodate the requirements of the institutions and other desirable indicators which were previously not being captured. It also made provisions for training of CBN and NBS staff who participated in the survey exercise. The period of the survey was designated with staggered monitoring/retrieval periods embedded within it. Provision was also made for data entry/processing, statistical analysis, report writing and harmonization of the report to ensure data consistency, etc.

The work programme which was used as a monitoring guide for the survey, also helped in programme discipline at each level of activity. The work programme was, however, revised to accommodate delays which were encountered in the retrieval of completed records in the field, especially for NISE and SAS operations. Overall, the work programme was well articulated.

III.2 Training of field staff

To facilitate proper understanding of the requirements of the survey exercise, a training programme was organized for all the enumerators and field officers. The training for the survey was design to be at two levels. The first level involved the Training of Trainers (TOT), which was done in 2 days for senior officers of the NBS and the CBN. The second level training was undertaken at the state level for the field staff (supervisors, enumerators, state officers and zonal controllers). This was done within a period of three days. The training sessions included classroom teaching, power-point presentations, mock interviews, role playing, field practice and home exercises. The training programme was quite comprehensive and efficient, with the overall aim of improving participants' ability in the art of collecting good quality data.

III.3 Data collection

Two approaches were adopted for data capture. The first approach - the household component - involved using 3 teams to conduct the survey. Each team was made up of one supervisor and four interviewers, and was required to cover 20 Enumeration areas in a roving manner. A pair of interviewers covered 10 EAs, with an average of 2 days allocated to administer the General Household Survey and private farmers questionnaires. The agricultural survey was conducted using the interview approach. The limitation of this approach lay in the fact that responses from farmers were based on memory recall and therefore could lead to the introduction of some bias in the answers provided by farmers that fell within the samples taken. Also, the hectares cultivated and the quantum of crops produced were recorded in local units by farmers. These could lead to some measurement errors when converting to standard units. These limitations were noted and taken care of, during the data processing stage. Altogether, four weeks was allocated to data collection.

The second approach involved the lodgement and retrieval of questionnaire for both NISE and SAS operations. Two officers (1 NBS and 1 CBN) covered each state, but 6 NBS and 6 CBN officers were deployed to Lagos, being the commercial nerve centre of Nigeria, while Rivers and Kano used 1 CBN and 3 NBS officers each, also because of their relative importance. Altogether, 480 enumerators and 110 supervisors from NBS as well as 37 CBN staff participated in the field survey.

III.4 Coverage and scope

Coverage

The survey covered the 36 states of the Federal Republic of Nigeria, including the Federal Capital Territory (FCT), Abuja. The target population canvassed were Households, Private and Public Establishments/ Agencies as well as Parastatals at federal, state and local government levels.

Scope

1. National Integrated Survey of Households (NISH)

   The subjects covered under the National Integrated Survey of Households include: household composition; household amenities, health, education, employment, female contraceptive prevalence, births and deaths in last 12 months, child immunization and child malnutrition, crop production, livestock production, poultry keeping, farming inputs and processing and storage facilities.

2. National Integrated Survey of Establishments (NISE)

   Under the National Integrated Survey of Establishments, fourteen (14) sectors and sub-sectors were covered. These are: Modern Agricultural Holding, Fishing, Mining and Quarrying, Manufacturing, Electricity, Oil and Gas, Water Supply, Construction, Wholesale and Retail Trade, Hotel and Restaurant, Transport, Communications, Financial Institutions, Real Estate, Renting and Business Activities, Public Administration and Defense, Health and Social Work, Other Community, Social and Personal Services. Subject areas covered include kind of activity; legal form of ownership; persons engaged; paid employees, wages and salaries; description of products, installed production capacity; production and cost of production/operation, etc.

3. System of Administrative Statistics (SAS)

   The SAS covered subjects which cut across different sectors and institutions, such as Housing, Electricity, Transportation, Communication, Education, Health, Labour, Foreign Trade Statistics, Agriculture, Water and Sanitation, Oil and Gas, Energy and Fiscal operations, etc.

III.5 Quality control and retrieval of records

To ensure reliable results from the survey, some quality control measures were adopted at various levels of the exercise. At the data collection stage, there were three layers of supervision involving - the field supervisors at the first layer, a combination of CBN and NBS State officers and Zonal Controllers at the second, and NBS headquarters staff at the third layer.

Eight quality control instruments which were used for skim and spot checks, were also developed. NBS and CBN staff reported on the supervision and monitoring efforts during the period of the data collection. Retrieval of records was implemented in two stages. The first level coincided with the second layer of supervision and monitoring, while the second level

was undertaken by NBS headquarters staff. Furthermore, a mop-up exercise was done by NBS State officers for two weeks after the scheduled period of data collection, due to low response rate of the NISE and SAS survey questionnaires in the field.

With these measures in place, the response rate was quite encouraging. The retrieval status of both General Household survey and Private Farmers Questionnaires was very high, ranging from 85 to 95 percent. The response rate for the NISE sectoral operations varied between 60 to 70 percent. The retrieval rate for System of Administrative Statistics, which involved more of government establishments, was fairly encouraging.

III.6 Data processing and analysis

The processing and analysis plan involved five main stages: training of data processing staff; manual editing and coding; development of data entry programme; data entry and editing; and tabulation. Specialized data processing packages were employed. Integrated Micro Processor System (IMPS) and ACCESS software were used for data entry, Statistical Package for Social Sciences (SPSS) and Censuses and Surveys Processing System (CSPro) for editing, and a combination of SPSS, Statistical Analysis Software (SAS) and EXCEL for table generation. The subject-matter specialists and computer personnel from both NBS and CBN handled the data processing work. Tabulation plans were equally developed by these officers for the various areas covered in the three-survey system used in the exercise.

IV. Estimation of quarterly gross domestic product (GDP)

National accounts aggregates are universally accepted indicators for measuring the economic performance of a nation. National accounts statistics therefore serve as a framework that provides a comprehensive, consistent and regular picture of an economy as well as the interrelationships among the sectors of the economy.

Quarterly estimates of the Gross Domestic Product (GDP), therefore, offer high frequency indicators, thereby yielding timely information about the current situation as well as changes within the economy on short-term basis. The procedure used for the compilation of quarterly GDP estimates reported for 2004 and 2005 was based on the production approach to estimation of GDP, which is internationally guided by the blueprint of the United Nation's 1993 System of National Accounts (SNA '93).

IV.1 Sources of data

The analysis derived from three data sources, namely:

1. Survey results on major economic indicators as jointly conducted by the National Bureau of Statistics and the Central Bank of Nigeria.
2. Administrative Statistics data earlier collected prior to the survey by the National Accounts Division of NBS. This was used in filling up some existing data gaps.
3. Input-output relations established from the previous quarterly GDP analysis/estimation by the National Accounts Division of the NBS.

IV.2 Producing the estimates

The first step taken in the production of the quarterly GDP series was the cleaning up of the sectoral accounts. This was done by ensuring that all data from the sectoral accounts, such

as agricultural and manufacturing, etc, were finalized before exporting them to the national accounts table. This was to ensure internal consistency of the national accounts with the sectoral accounts, so that growth drivers of the GDP could easily be identified.

Consequently, the estimate of intermediate consumption, compensation of employees, capital consumption allowance, indirect taxes and subsidies were independently produced from the survey results. Operating surplus was derived by netting off compensation of employees, capital consumption from the value added at basic prices. Also, by adding indirect taxes and removing subsidies from the estimates of value added at basic prices, the current price estimate for value added at producers' price was obtained. All other variables in National Accounts were obtained by either adding the components derived above or as residuals. Current price estimates of GDP were derived while the value added at current prices was deflated using established 1990 implicit price deflators to obtain value added at 1990 constant prices.

The gross domestic product for each quarter was produced by aggregating the value added for all the industries for the particular quarter. The overall annual GDP was derived by summing the afore-mentioned value added for the four quarters. It is pertinent to observe that actual quarterly GDP aggregates were generated for the four quarters of 2004 and the first two quarters of 2005 while the third and fourth quarters of 2005 were based on projected figures, since the survey did not cover those quarters. This was aimed at providing two-quarters-ahead estimates, while at the same time making it possible for the annual estimates of 2004 to be comparable with those of 2005.

IV.3 Summary of results

Although various data sets were generated from the NBS/CBN collaborative survey, our interest in this paper would be limited to the quarterly GDP estimates as presented below.

The result of the survey indicated that the Nigerian economy recorded an overall GDP growth at current basic prices of 23.57 percent over that of 2004. The GDP at current basic half yearly growth for 2005 over 2004 was 25.42 percent.

The quarterly GDP estimates at current basic prices rose from a level of ₦2,631.2 billion, ₦2,592.3 billion, ₦ 2,985.5 billion, ₦3,202.0 billion in 2004 to ₦3,255.0 billion, ₦3,296.4 billion, ₦3,716.9 billion, ₦3,832.4 billion, respectively in 2005. This showed overall quarterly growth rates of 23.71, 27.16, 24.50 and 19.69 percent, respectively in 2005 over the levels in 2004 (table 1).

The primary sector consisting of crop production, livestock, forestry and fishing accounted for about 34.21 percent of the overall GDP at current basic prices in 2004 and 33.71 percent in 2005. Also, the share of the primary sector in the quarterly GDP at current prices in 2004 was 27.44, 35.58, 38.59 and 34.59 percent, while its share in 2005 was 27.03, 34.08, 37.70, and 35.19 percent, respectively.

The GDP of crude petroleum and Natural Gas sector at current basic prices rose from a level of ₦4,247.7 billion in 2004 to ₦5,506.8 billion in 2005, representing an annual growth of 29.64 percent. The GDP levels in the first through the fourth quarters stood at ₦1,1 56.3 billion, ₦968.7 billion, ₦1,023.9 billion, ₦1,098.8 billion in 2004 and ₦1,499.1 billion, ₦1,255.8 billion, ₦1,327.3 billion, ₦1,424.5 billion in 2005, respectively. This sector accounted for 37.22 percent of the GDP at current prices in 2004 and 39.05 percent in 2005.

On the other hand, the GDP at 1990 basic prices increased by 5.52 percent from a level of ₦527.6 billion in 2004 to ₦556.7 billion in 2005. The half yearly growth of GDP at 1990 prices for 2005 over 2004 stood at 5.58 percent. The quarterly GDP estimates at constant prices rose from the levels of ₦114.6 billion, ₦123.7 billion, ₦142.4 billion, ₦146.9 billion in 2004 to ₦118.5 billion, ₦133.7 billion, ₦150.6 billion, ₦153.8 billion, respectively in 2005. This showed corresponding quarterly growth rates in 2005 of 3.40, 8.11, 5.78 and 4.73 percent

respectively. The primary sector accounted for about 40.98 percent of the overall GDP at constant prices in 2004 and 41.48 percent in 2005. On quarterly basis, the primary sector GDP share at constant prices was 34.88, 41.08, 45.51, 41.27 percent in 2004 and 36.04, 40.58, 45.96 and 42.09 percent in 2005, respectively (table 2).

The GDP for the crude petroleum and natural gas sector at constant basic prices fell from a level of ₦135.7 billion in 2004 to ₦132.6 billion in 2005, representing a contraction of 2.26 percent, during the period. This sector accounted for 25.72 percent of the GDP at constant prices in 2004 and 23.82 percent in 2005.

The non-oil GDP, at 1990 constant basic prices, increased from a level of ₦391.91 billion in 2004 to ₦424.08 billion in 2005, representing a growth of 8.21 percent. This was a positive development as it indicated that the economy was non-oil sector-led, a natural fall out from the recent economic reforms being implemented by Nigeria. Non-oil sector's share in total GDP in 2004 and 2005 stood at 74.28 and 76.18 percent, respectively. Table 3 was the revised table of GDP at constant basic prices, obtained after firm figures on crude oil output for the first and second halves of 2005 were obtained. The figures showed that overall GDP growth was 6.2 per cent.

V. Report writing

The report writing arrangement involved development of tabulation plans and the report writing format/outline. A core team of senior officers from subject-matter divisions in the NBS and CBN worked together to produce the draft report for finalization. The report was later harmonized by a select team from the expert working group to ensure internal consistency. The report was presented in two volumes: volume I is the statistical report with the executive summary for presentation to the Management of the two institutions, while volume II contains the detailed statistical tables.

VI. Modifications based on lessons of experience

VI.1 GDP results

After the analysis of the survey results were completed, an attempt was made to compare the new GDP series with the old ones. A cursory look at table 4 reveals a seemingly structural break, when the old 2000-2004 annual GDP series was compared with the new 2004-2005 series. This was actually anticipated, hence, the need to conduct a new 2004 survey, so as to have an overlap with the old series being compiled by the NBS. However, to overcome this and therefore achieve a better comparison between the old and new series, we spliced the old series, using a common factor derived from the old and new 2004 GDP series. The results are presented in table 5. From table 5 we observe that the new GDP at 1990 constant basic prices would have been ₦435.9 billion, ₦451.1 billion, ₦497.3 billion and ₦527.6 billion in 2001 through 2004. This implies that the old GDP series for 2001 through 2004 were under-estimated by ₦91.6 billion, ₦94.8 billion, ₦104.5 billion and ₦110.9 billion, respectively. A major fall out from this development was the realization that, as governments and institutions are prepared to fund data production activities, substantial benefits accrue to the economy, as observed in the above case. For instance, by spending just ₦54.1 million (US$410,500) to conduct a comprehensive nationwide survey, Nigeria realized that it had been under-estimating its GDP by as much as ₦100 billion (on average) over the years, 2001-2004. This empirical evidence shows that statistical information is a strategic resource. According to Prof. Kiregyera (2004), "how well this resource is harnessed and used for

development in each country, will depend upon how well the National Statistical System (NSS) is engineered and operationalised".

VI. 2 2005 annual survey

Based on the success of the 2005 half year survey, another institution, the Nigerian Communications Commission (NCC) indicated its interest in joining the collaboration, during the 2005 annual survey, which was conducted between January and July, 2006. The aim of the survey was to capture for the first time, core Information and Communications Technology (ICT) indicators at the household and enterprise levels. Because of the expanded mandate, the resource envelope provided by the CBN was enlarged to ₦79.4 million or about US$615,300.0. The sharing formula was also reviewed to 50:30:20 for CBN, NBS and NCC, respectively.

The field results of the 2005 half year survey tended to suggest that there was a crowding out of the livestock and fishing farming housing units. To overcome this, the farming housing units in the 2005 annual survey were further stratified into Crop Farming Housing Units (CFHUs), Livestock Farming Housing Units (LFHUs) and Fishing Farming Housing Units (FFHUs) and distinct questionnaires were administered to them. In each EA, 5 HUs were studied for crop farming, 3 HUs were studied for livestock and 2 HUs for fishery. This implied that at each level of selection, different random start was used for systematically selecting housing units. Quarterly farm gate prices were also introduced, to enhance the compilation of agricultural GDP.

In line with the provisions of the 2004/05-2008/09 Statistical Master Plan (SMP) for strengthening the National Statistical System (NSS), the hiring of enumerators was outsourced, such that those that participated were hired on part time basis. This was intended to lighten the financial burden on the NBS. Again, the questionnaires used for the GHS was redesigned to be scannable, in order to reduce the time for questionnaire processing. Variables which were left out in the questionnaires, which were found to be necessary for the computation of the GDP were incorporated. Enough time was also allowed for questionnaire design and printing, so as not to dislocate the field operations owing to the late arrival of questionnaires to the field.

Other major fall out from the collaborative efforts was the technical knowledge imparted to the participants, as well as the networking during the working sessions. This is obviously going to rub off in the development of the NSS. The collaboration has also shown that as more institutions indicate their interest, the lower is the financial burden per institution and the higher the chance of obtaining more comprehensive data sets of high quality.

VII. Challenges and prospects

VII.1 Challenges

The conduct of surveys in Nigeria is fraught with many problems and challenges. Some of the major challenges faced in the conduct of surveys are highlighted as follows:

(i) Apathy and non-disclosure by respondents

The most serious challenge that is encountered in the process of data gathering has been the apathy exhibited by respondents to survey questionnaires. This makes the retrieval process very difficult, as retrieval appointments are not honoured or sometimes the field staff is compelled to make repeated calls/visits.

Related to this, is the issue of non-disclosure of required information by respondents, especially those pertaining to financial transactions. Most of the respondents feel that the questionnaires are for tax assessment purposes. For this reason, they tend to understate any information they provide in this section.

(ii) Non-availability of relevant information

At times, the respondents are unable to respond to certain aspects of the questionnaires due to poor record keeping and documentation by the establishment/business unit. In this situation, relevant information cannot be captured through such returns.

(iii) Educational level of respondents

The quality of survey returns is usually affected by the educational level of the respondents. Some of the respondents find it difficult to understand and give useful answers to some of the structured questionnaires due to low educational background. In such cases, it may be necessary to resort to the interview method.

(iv) Accessibility to respondents

The field officer sometimes encounters the problem of accessibility to the respondents in certain locality. The accessibility to such respondents are usually hindered by bad road network or lack of telephone facilities. This may result in poor administration and retrieval of questionnaires.

(v) Poor funding of surveys

Funding is a key factor to the success of any survey exercise. Survey is expensive to administer, both in terms of time and money. Inadequate funding had been one of the major problems of the former Federal Office of Statistics (FOS), which was vested with the statutory responsibility of conducting national surveys. It is pertinent to note that survey is a capital intensive project. If not well funded, the effort often ends in futility and the resources spent could be regarded as “money down the drains”.

The conduct of survey does not start and end in the field. The processing of the returns is another phase which requires adequate funding. In some cases this aspect of the survey is neglected with the adverse result that the survey returns are dumped in the office or abandoned. However, events have shown that as more institutions indicate their interest, the less the financial burden per institution for surveys and the better for the NSS.

(vi) Human capacity/field experience

Apart from material support, surveys also require high human capacity and sufficient field experience to adequately handle the various stages of the exercise. To ensure good quality data, there is need to put in place adequate quality control measures. It is also important to train the field officers as well as closely monitor each stage of the survey. All these require adequate and experienced manpower.

(vii) Other infrastructural problems

Other infrastructural problems that hinder effective execution of survey projects include: erratic electricity supply by the public power source (Power Holding Company of Nigeria), inadequate Information and Communication Technology (ICT) and statistical infrastructure as well as transport facilities.

VI.2 Prospects

The prospects of improving on the conduct of surveys in Nigeria hinges on the commitment of the government to ensure that accurate and timely information are made available to all stakeholders. The government must also be prepared to sponsor the survey exercise on regular basis. To this end, sufficient provisions should be made in the annual budget for this purpose.

The experience of the collaborative survey between the NBS and CBN demonstrated great commitment on the part of the two institutions to generate relevant economic data for the country. Such collaboration should be encouraged and extended to other institutions. Already, the National Communications Commission (NCC) had realized the need for synergy of efforts in the conduct of survey and had participated in the funding of the just concluded 2006 Annual Survey of Socio-economic Activities in Nigeria. The NCC example is worthy of note by other agencies that require field information, as this would assist in eliminating the duplication of efforts and multiple surveys that was prevalent in the past.

With regard to funding of surveys, effort should be intensified to reach out to end-users of survey products to provide assistance. The Department for International Development (DFID) of the UK and the European Union (EU) had, in the recent past, provided both financial and technical support to the National Bureau of Statistics to conduct some core surveys in the country. In fact, the initial effort of the NBS at generating quarterly GDP for Nigeria was an outcome of the DFID assistance.

Overall, the collaborative survey by NBS/CBN had provided the necessary impetus for generating timely and accurate macroeconomic data for Nigeria. There is therefore the need to sustain and improve upon the observed limitations in future endeavours.

VIII. Recommendations and conclusion

To consolidate on the recent experience gained from the NBS/CBN collaborative survey of socio-economic activities in Nigeria, it would be necessary to adopt a more proactive approach in the future. The planning of subsequent surveys should start early enough and a bottom-top approach should be adopted. This implies that the subject matter experts from the two organizations should be involved in the planning from the beginning. This is to ensure that all the relevant details are taken into consideration in order to guarantee smooth operations.

It is obvious that the survey frames maintained by the two organizations are outdated and need serious updating. A quick-listing survey should be carried out to update the existing frames of the NBS. In particular, the frames for the agricultural survey should be robust enough to show the activity sectors in which the farmers are engaged and also identify those engaged in mixed cropping at State and Local government levels. There is also the need to employ standard statistical procedures in the conduct of the agricultural surveys. In this regard, the unit of measurements and the weights applied across the regions should be standardized. Weighing scales should be purchased for the NBS field officers so that crops and other items produced are weighed in a more scientific manner to ensure uniformity across the States. This pre-supposes that yield plots should have been laid appropriately, so as to enhance measurement of overall output and yield per hectare.

The importance of training of the enumerators and other field officers cannot be over-emphasized. The training programme should be well-focused to sharpen the survey participants on the best field practices. The use of enlightened staff in the field should be seen as a necessary pre-requisite for obtaining good quality returns.

Overall, the result of the collaborative survey was generally robust and quite revealing. Remarkable achievement was recorded in the generation of quarterly GDP series for Nigeria.

It is hoped that if the effort is sustained the problem of paucity of high frequency data for macroeconomic analysis will be an issue of the past. However, the planning and execution of the survey was fraught with some daunting challenges. For instance, the magnitude of the work involved was seriously under-estimated in terms of time, manpower, infrastructure and funding. Also, the number of survey instruments administered concurrently was quite overwhelming. Efforts should be geared towards eliminating these shortcomings in order to ensure better performance in future.

It is pertinent to note that a nation-wide survey is highly capital intensive. The government should be prepared to spend a substantial amount of money to generate good quality data for planning purposes. Going forward, the conduct of national surveys should form part of the annual budgets of the Federal and State governments.

Finally, we wish to recommend that for developing countries where resources are lean, collaborative efforts would not only lead to the optimization of resources, but would eliminate duplications of efforts and lead to the emergence of acceptable national aggregates.

Table 1

Nigeria: gross domestic product at current basic prices

₦ million

Activity sector	2004				Total	2005				Total
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Crop Production	618,328.25	811,555.83	1,062,751.68	985,460.65	3,478,096.41	749,924.60	984,276.03	1,288,932.90	1,195,192.33	4,218,325.85
Livestock	55,583.28	59,516.53	62,650.56	66,137.16	243,887.53	69,804.76	74,744.37	78,680.27	83,058.95	306,288.35
Forestry	11,959.96	12,676.10	13,211.28	13,810.92	51,658.25	15,224.04	16,135.63	16,816.87	17,580.17	65,756.72
Fishing	36,042.14	38,494.48	13,473.91	42,105.97	130,116.50	45,042.22	48,106.94	16,838.48	52,620.25	162,607.90
Coal Mining	0.09	0.09	0.09	0.09	0.36	0.10	0.10	0.10	0.10	0.41
Crude Petroleum & Natural Gas	1,156,329.14	968,706.54	1,023,856.69	1,098,823.67	4,247,716.05	1,499,081.90	1,255,845.24	1,327,342.69	1,424,530.98	5,506,800.81
Metal Ores	2.13	4.60	3.12	3.19	13.04	2.43	5.26	3.56	3.65	14.90
Quarrying & Other Mining	3,299.15	3,145.78	3,142.26	3,450.73	13,037.93	3,899.37	4,286.91	4,458.39	4,636.72	17,281.39
Oil Refining	6,337.51	4,998.19	5,604.89	5,515.99	22,456.58	8,194.71	6,462.91	7,247.40	7,132.44	29,037.47
Cement	1,438.83	1,518.58	1,308.55	1,211.40	5,477.36	1,860.48	1,963.60	1,692.02	1,566.39	7,082.50
Other Manufacturing	15,501.93	68,948.54	72,834.50	164,097.42	321,382.38	980.03	4,206.01	4,410.22	10,589.46	20,185.72
Electricity	4,536.04	5,953.55	7,796.32	7,229.31	25,515.22	4,949.32	6,495.99	8,506.65	7,887.98	27,839.94
Water	324.56	328.80	332.19	328.88	1,314.43	365.81	370.60	374.41	370.68	1,481.50
Building & Construction	43,502.39	37,725.81	38,274.78	46,575.49	166,078.47	51,785.23	48,696.59	51,853.07	63,007.86	215,342.74
Wholesale and Retail Trade	397,916.51	294,129.89	364,001.87	428,374.09	1,484,422.36	455,877.18	473,383.07	489,572.24	511,947.04	1,930,779.52
Hotel and Restaurants	8,585.93	8,021.89	9,416.60	9,225.34	35,249.77	10,897.76	10,421.62	12,276.83	12,288.71	45,884.92
Road Transport	89,207.14	84,356.94	85,673.13	85,675.81	344,913.02	87,280.48	94,727.52	95,897.78	95,648.47	373,554.25
Rail Transport & Pipelines	0.87	1.98	1.45	2.10	6.41	0.95	2.15	1.57	2.28	6.94
Water Transport	178.62	220.88	238.59	271.84	909.92	192.94	238.58	257.72	293.64	982.88
Air Transport	584.91	676.45	759.10	989.17	3,009.64	638.00	737.86	828.00	1,078.96	3,282.82

Table 1 (cont)

Nigeria: gross domestic product at current basic prices

₦ million

Activity sector	2004				Total	2005				Total
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Transport Services	3,282.80	3,796.60	4,260.45	5,551.73	16,891.58	3,615.55	4,181.42	4,692.29	6,114.45	18,603.71
Telecommunications	4,616.37	4,947.80	5,279.24	5,610.67	20,454.08	5,994.04	6,424.39	6,854.73	7,285.07	26,558.22
Post	265.75	263.01	282.17	344.49	1,155.42	303.42	300.29	322.17	393.32	1,319.20
Financial Institutions	22,701.87	24,841.44	24,717.49	27,611.63	99,872.43	28,761.00	31,471.62	31,314.59	34,981.17	126,528.38
Insurance	684.16	731.98	806.30	858.41	3,080.85	937.36	1,002.89	1,104.71	1,176.11	4,221.07
Real Estate	89,219.88	97,311.65	124,424.19	133,732.60	444,688.32	136,590.20	148,978.21	190,485.87	204,736.47	680,790.75
Business Services (Not Health or education)	5,278.70	4,590.99	4,445.76	4,237.71	18,553.16	6,525.37	7,549.98	9,249.00	10,789.02	34,113.37
Public Administration	24,494.21	24,494.21	24,494.21	27,555.98	101,038.60	27,925.04	27,925.04	27,925.04	31,415.66	115,190.77
Education	5,537.68	5,537.68	5,537.68	6,229.89	22,842.94	6,313.34	6,313.34	6,313.34	7,102.50	26,042.52
Health	1,450.68	1,450.68	1,450.68	1,632.01	5,984.04	1,653.87	1,653.87	1,653.87	1,860.61	6,822.22
Private Non Profit Organisations	36.36	36.36	36.36	40.90	149.98	37.45	37.45	37.45	42.13	154.48
Other Services	23,686.13	22,947.74	24,134.14	28,916.88	99,684.88	29,965.66	29,031.52	30,532.45	36,583.17	126,112.79
Broadcasting	341.58	341.58	341.58	384.27	1,409.00	422.36	422.36	422.36	475.15	1,742.22
GDP Current Basic Price	2,631,255.51	2,592,273.19	2,985,541.80	3,201,996.40	11,411,066.91	3,255,046.97	3,296,399.33	3,716,899.04	3,832,391.88	14,100,737.22

Table 2

Nigeria: gross domestic product at 1990 constant basic prices

₦ million

Activity sector	2004				Total	2005				Total
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Crop Production	34,213.72	44,905.50	58,804.83	54,528.11	192,452.16	36,567.63	47,995.01	62,850.61	58,279.66	205,692.91
Livestock	3,344.91	3,400.99	3,457.08	3,513.16	13,716.14	3,569.02	3,628.86	3,688.70	3,748.54	14,635.12
Forestry	701.38	706.70	712.02	717.34	2,837.43	742.76	748.39	754.03	759.66	3,004.84
Fishing	1,713.75	1,807.49	1,821.14	1,860.36	7,202.74	1,828.04	1,902.30	1,916.67	1,957.95	7,604.96
Coal Mining	0.03	0.03	0.03	0.03	0.11	0.03	0.03	0.03	0.03	0.12
Crude Petroleum & Natural Gas	34,549.50	33,301.80	33,505.69	34,313.72	135,670.71	33,768.34	32,548.86	32,748.14	33,537.89	132,603.23
Metal Ores	1.11	2.41	1.63	1.67	6.82	1.24	2.67	1.81	1.85	7.56
Quarrying & Other Mining	243.98	320.23	419.35	388.85	1,372.41	267.15	350.64	459.17	425.77	1,502.73
Oil Refining	156.55	155.69	156.08	156.02	624.34	172.20	171.26	171.69	171.62	686.77
Cement	93.84	97.56	88.20	78.58	358.19	103.23	107.32	97.02	86.44	394.01
Other Manufacturing	890.96	3,992.83	4,205.34	9,365.12	18,454.25	980.03	4,206.01	4,410.22	10,589.46	20,185.72
Electricity	3,244.90	4,258.93	5,577.16	5,171.55	18,252.54	3,447.80	4,525.24	5,925.91	5,494.94	19,393.90
Water	155.40	157.43	159.05	157.47	629.35	171.72	173.96	175.75	174.00	695.43
Building & Construction	2,021.10	1,765.32	1,760.62	2,075.43	7,622.47	2,142.17	1,966.95	2,025.23	2,383.93	8,518.28
Wholesale and Retail Trade	18,487.02	13,763.37	16,743.86	19,088.58	68,082.83	18,858.05	19,120.82	19,121.30	19,369.75	76,469.93
Hotel and Restaurants	499.39	442.39	515.41	494.30	1,951.49	530.08	487.13	569.55	558.08	2,144.85
Road Transport	3,063.15	3,066.17	3,203.92	3,247.40	12,580.64	3,222.04	3,292.88	3,429.81	3,467.20	13,411.93
Rail Transport & Pipelines	0.21	0.49	0.35	0.51	1.57	0.23	0.52	0.38	0.55	1.67
Water Transport	74.05	75.28	76.51	77.74	303.58	78.41	79.72	81.03	82.33	321.49
Air Transport	72.96	69.38	73.25	85.13	300.72	77.27	73.47	77.58	90.15	318.47

Table 2 (cont)

Nigeria: gross domestic product at 1990 constant basic prices

₦ million

Activity sector	2004				Total	2005				Total
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Transport Services	195.85	186.22	196.62	228.50	807.19	207.40	197.20	208.22	241.98	854.81
Telecommunications	1,357.76	1,455.24	1,552.72	1,650.20	6,015.91	1,762.95	1,889.53	2,016.10	2,142.67	7,811.24
Post	69.14	71.70	74.25	76.80	291.89	76.64	79.47	82.31	85.14	323.56
Financial Institutions	5,235.32	5,422.64	4,959.86	5,268.91	20,886.73	5,366.21	5,558.20	5,083.85	5,400.64	21,408.90
Insurance	158.06	160.07	162.08	164.10	644.31	175.21	177.44	179.67	181.90	714.21
Real Estate	1,731.59	1,757.00	1,782.78	1,808.94	7,080.32	1,919.46	1,947.62	1,976.20	2,005.20	7,848.48
Business Services (Not Health or education)	160.06	165.61	156.63	143.30	625.60	134.14	150.78	180.16	205.01	670.10
Public Administration	986.92	986.92	986.92	986.92	3,947.67	1,026.40	1,026.40	1,026.40	1,026.40	4,105.58
Education	218.12	218.12	218.12	218.12	872.48	241.13	241.13	241.13	241.13	964.53
Health	50.91	50.91	50.91	50.91	203.63	56.00	56.00	56.00	56.00	223.99
Private Non Profit Organisations	4.13	4.13	4.13	4.13	16.54	4.58	4.58	4.58	4.58	18.33
Other Services	825.95	838.46	851.17	864.07	3,379.65	912.67	926.50	940.54	954.79	3,734.51
Broadcasting	95.91	95.91	95.91	95.91	383.63	103.58	103.58	103.58	103.58	414.32
GDP Constant Basic Price	114,617.62	123,702.90	142,373.62	146,881.89	527,576.03	118,513.83	133,740.48	150,603.35	153,828.84	556,686.50
Agriculture GDP at Constant Basic Prices	39,973.76	50,820.68	64,795.06	60,618.97	216,208.46	42,707.45	54,274.57	69,210.01	64,745.81	230,937.84
Non-Oil GDP at Constant Basic Prices	80,068.13	90,401.10	108,867.92	112,568.17	391,905.32	84,745.49	101,191.62	117,855.21	120,290.95	424,083.27
Oil GDP at Constant Basic Prices	34,549.50	33,301.80	33,505.69	34,313.72	135,670.71	33,768.34	32,548.86	32,748.14	33,537.89	132,603.23

Table 2 (cont)

Nigeria: gross domestic product at 1990 constant basic prices

Per cent

Activity sector	2004				Total	2005				Total
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Overall GDP Growth Rate (%)		7.93	15.09	3.17		–19.31	12.85	12.61	2.14	5.52
Agriculture GDP Growth Rate (%)		27.14	27.50	–6.45		–29.55	27.08	27.52	–6.45	6.81
Non-Oil GDP Growth Rate (%)		12.91	20.43	3.40		–24.72	19.41	16.47	2.07	8.21
Oil GDP Growth Rate (%)		–3.61	0.61	2.41		–1.59	–3.61	0.61	2.41	–2.26
Share Agriculture GDP (%)	34.88	41.08	45.51	41.27	40.98	36.04	40.58	45.96	42.09	41.48
Share of Non-Oil GDP (%)	69.86	73.08	76.47	76.64	74.28	71.51	75.66	78.26	78.20	76.18
Share of Oil GDP (%)	30.14	26.92	23.53	23.36	25.72	28.49	24.34	21.74	21.80	23.82
Growth Rates Over 2004 Levels										
Agriculture GDP Growth Rate (%)						6.84	6.80	6.81	6.81	6.81
Non-Oil GDP Growth Rate (%)						5.84	11.94	8.26	6.86	8.21
Oil GDP Growth Rate (%)						–2.26	–2.26	–2.26	–2.26	–2.26
Overall GDP Growth Rate (%)						3.40	8.11	5.78	4.73	5.52

Table 3

Nigeria: gross domestic product at 1990 constant basic prices (revised)[1]

₦ million

Activity sector	2004				Total	2005				Total
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Crop Production	34,213.72	44,905.50	58,804.83	54,528.11	192,452.16	36,567.63	47,995.01	62,850.61	58,279.66	205,692.91
Livestock	3,344.91	3,400.99	3,457.08	3,513.16	13,716.14	3,569.02	3,628.86	3,688.70	3,748.54	14,635.12
Forestry	701.38	706.70	712.02	717.34	2,837.43	742.76	748.39	754.03	759.66	3,004.84
Fishing	1,713.75	1,807.49	1,821.14	1,860.36	7,202.74	1,828.04	1,902.30	1,916.67	1,957.95	7,604.96
Coal Mining	0.03	0.03	0.03	0.03	0.11	0.03	0.03	0.03	0.03	0.12
Crude Petroleum & Natural Gas	34,549.50	33,301.80	33,505.69	34,313.72	135,670.71	34,721.35	33,467.45	33,672.35	34,484.39	136,345.54
Metal Ores	1.11	2.41	1.63	1.67	6.82	1.24	2.67	1.81	1.85	7.56
Quarrying & Other Mining	243.98	320.23	419.35	388.85	1,372.41	267.15	350.64	459.17	425.77	1,502.73
Oil Refining	156.55	155.69	156.08	156.02	624.34	172.20	171.26	171.69	171.62	686.77
Cement	93.84	97.56	88.20	78.58	358.19	103.23	107.32	97.02	86.44	394.01
Other Manufacturing	890.96	3,992.83	4,205.34	9,365.12	18,454.25	980.03	4,206.01	4,410.22	10,589.46	20,185.72
Electricity	3,244.90	4,258.93	5,577.16	5,171.55	18,252.54	3,447.80	4,525.24	5,925.91	5,494.94	19,393.90
Water	155.40	157.43	159.05	157.47	629.35	171.72	173.96	175.75	174.00	695.43
Building & Construction	2,021.10	1,765.32	1,760.62	2,075.43	7,622.47	2,142.17	1,966.95	2,025.23	2,383.93	8,518.28
Wholesale and Retail Trade	18,487.02	13,763.37	16,743.86	19,088.58	68,082.83	18,858.05	19,120.82	19,121.30	19,369.75	76,469.93
Hotel and Restaurants	499.39	442.39	515.41	494.30	1,951.49	530.08	487.13	569.55	558.08	2,144.85
Road Transport	3,063.15	3,066.17	3,203.92	3,247.40	12,580.64	3,222.04	3,292.88	3,429.81	3,467.20	13,411.93
Rail Transport & Pipelines	0.21	0.49	0.35	0.51	1.57	0.23	0.52	0.38	0.55	1.67
Water Transport	74.05	75.28	76.51	77.74	303.58	78.41	79.72	81.03	82.33	321.49
Air Transport	72.96	69.38	73.25	85.13	300.72	77.27	73.47	77.58	90.15	318.47

Table 3 (cont)

Nigeria: gross domestic product at 1990 constant basic prices (revised)[1]

₦ million

Activity sector	2004				Total	2005				Total
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Transport Services	195.85	186.22	196.62	228.50	807.19	207.40	197.20	208.22	241.98	854.81
Telecommunications	1,357.76	1,455.24	1,552.72	1,650.20	6,015.91	1,762.95	1,889.53	2,016.10	2,142.67	7,811.24
Post	69.14	71.70	74.25	76.80	291.89	76.64	79.47	82.31	85.14	323.56
Financial Institutions	5,235.32	5,422.64	4,959.86	5,268.91	20,886.73	5,366.21	5,558.20	5,083.85	5,400.64	21,408.90
Insurance	158.06	160.07	162.08	164.10	644.31	175.21	177.44	179.67	181.90	714.21
Real Estate	1,731.59	1,757.00	1,782.78	1,808.94	7,080.32	1,919.46	1,947.62	1,976.20	2,005.20	7,848.48
Business Services (Not Health or education)	160.06	165.61	156.63	143.30	625.60	134.14	150.78	180.16	205.01	670.10
Public Administration	986.92	986.92	986.92	986.92	3,947.67	1,026.40	1,026.40	1,026.40	1,026.40	4,105.58
Education	218.12	218.12	218.12	218.12	872.48	241.13	241.13	241.13	241.13	964.53
Health	50.91	50.91	50.91	50.91	203.63	56.00	56.00	56.00	56.00	223.99
Private Non Profit Organisations	4.13	4.13	4.13	4.13	16.54	4.58	4.58	4.58	4.58	18.33
Other Services	825.95	838.46	851.17	864.07	3,379.65	912.67	926.50	940.54	954.79	3,734.51
Broadcasting	95.91	95.91	95.91	95.91	383.63	103.58	103.58	103.58	103.58	414.32
GDP Constant Basic Price	114,617.62	123,702.90	142,373.62	146,881.89	527,576.03	119,466.84	134,659.07	151,527.56	154,775.34	560,428.81
Non-Oil GDP at Constant Basic Prices										**8.2**
Oil GDP at Constant Basic Prices										**0.5**
Overall GDP Growth Rate (%)										**6.23**

[1] The 2005 GDP figures were revised, using actual Crude Oil production figures for first and second quarters of 2005, which were not firmed up as at the time of the survey.

Table 4

Gross domestic product at 1990 constant basic prices

Naria billion unless otherwise stated

Activity Sector	Old series					New series	
	2000	2001	2002	2003	2004	2004	2005
Agriculture	117.95	122.52	127.72	135.99	144.84	216.21	230.94
(a) Crop Production	98.39	102.13	106.37	113.82	121.22	192.45	205.69
(b) Livestock	11.45	11.79	12.36	12.88	13.72	13.72	14.64
(c) Forestry	2.56	2.61	2.62	2.66	2.84	2.84	3.00
(d) Fishing	5.55	5.99	6.37	6.63	7.06	7.20	7.60
Industry	121.76	128.42	123.55	149.88	156.08	156.49	155.38
(a) Crude Petroleum & Natural Gas	106.83	112.42	106.00	131.34	135.67	135.67	132.60
(b) Mining & Quarrying	0.97	1.07	1.11	1.17	1.30	1.38	1.51
(c) Manufacturing	13.96	14.93	16.44	17.37	19.11	19.44	21.27
Building & Construction	6.43	7.21	7.52	8.18	8.99	7.62	8.52
Wholesale and Retail Trade	43.16	44.24	47.11	49.82	54.66	68.08	76.47
Services	39.87	41.92	50.38	48.89	52.15	79.18	85.38
(a) Transport	7.50	7.86	9.22	9.33	9.89	13.99	14.91
(b) Communications	0.37	0.45	0.69	0.83	1.03	6.69	8.55
(c) Utilities	1.45	1.60	1.94	2.04	2.26	18.88	20.09
(d) Hotel and Restaurants	0.68	0.72	0.76	0.80	0.89	1.95	2.14
(e) Finance & Insurance	17.13	17.91	23.17	20.96	21.53	21.53	22.12
(f) Real Estate & Business Services	6.25	6.56	6.78	6.99	7.75	7.71	8.52
(g) Producers of Govt. Services	4.10	4.19	4.81	4.88	5.41	5.02	5.29
(h) Comm., Social & Pers. Services	2.39	2.63	3.01	3.06	3.39	3.40	3.75
Total (GDP)	**329.17**	**344.31**	**356.28**	**392.76**	**416.72**	**527.58**	**556.69**
Non-oil (GDP)	**222.34**	**231.89**	**250.28**	**261.42**	**281.05**	**391.91**	**424.08**
Total GDP growth rate (%)		4.60	3.48	10.24	6.10	***	5.52
Oil (GDP) GR (%)		5.23	-5.71	23.91	3.30	***	–2.26
Non-oil (GDP) GR (%)		4.30	7.93	4.45	7.51	***	8.21
Agriculture (GDP) GR (%)		3.87	4.24	6.48	6.51	***	6.81
Share of Non-oil in total GDP (%)	67.55	67.35	70.25	66.56	67.44	74.28	76.18
Share of Oil in total GDP (%)	32.45	32.65	29.75	33.44	32.56	25.72	23.82
Share of Agric in total GDP (%)	35.83	35.58	35.85	34.62	34.76	40.98	41.48

*** = not applicable.

Table 5

Nigeria: old GDP series compared with the 2004 and 2005 survey data

₦ billion

Item	2001	2002	2003	2004	2005
Current: new[1]	6,469.8	7,459.9	9,592.8	11,411.1	14,100.7
Old	4,685.9	5,403.0	6,947.8	8,265.0	
Constant at 1990 basic price: new[1]	435.9	451.1	497.3	527.6	556.7
Old	344.3	356.3	392.8	416.7	
Difference	91.6	94.8	104.5	110.9	
Deflator: new[1]	1,484.2	1,653.6	1,928.9	2,162.9	2,533.0
Old	1,361.0	1,516.4	1,768.8	1,983.4	

[1] New GDP series for 2001-2004 were derived from the survey data using a common factor from the old 2004 and new 2004 series.

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The household survey and monetary policy in Indonesia

Wijoyo Santoso and Aldrina Kusuma Sarie

1. Introduction

1.1 Background

The household sector plays an important role in the domestic economy. Its interaction with the production function, through factors such as labour and land, creates income in terms of salaries/wages and other surplus from different income sources. Part of this income that is not consumed is saved, which is a prominent source of financing investment.

Household saving is therefore a key determinant of investment, which gives rise to two key concepts in economic analysis: the positive saving rate (the surplus sector) and the negative one (the deficit sector). Financial institutions, such as banks and non-banks receive funds from the surplus sector and utilize these funds to lend to the deficit sector. The choice of allocating funds can be done in different ways, such as lending to the business sector, purchasing financial assets and marketable securities, or building fixed assets.

The household sector is one of the main surplus sectors in the economy, therefore its role as a supplier of funds is important for financial policymakers. Conducting household surveys is an important method to obtain data on household finances, and to determine how much of the income is not consumed, how to manage the household saving rate and how much of the past saving accumulation can be used for investment.

While households are one of the main economic agents in providing funds for investment, the government has an important role to stimulate household activities in investment.

1.2 The linkages between the household sector and monetary policy

The household balance sheet may serve as the transmission channel of monetary policy of the household sector through the interest rate channel as follows:

1. Household debt/income ratio

   The central bank, by raising or lowering interest rates, can affect household financial behaviour. Declining interest rates will boost households' preference for holding debt, resulting in an increase of debt and causing the household debt/income ratio to increase. Higher household debt levels indicate that households have the capacity to consume more goods and services. This will, in turn, generate demand for the production sector to augment their capacity to produce goods and services. To do so, they will need more investment.

2. Household saving

   An upward trend in interest rates in the economy increases households' incentive to hold financial assets (eg debt securities), hence creating a flow of funds from the household sector to the financial sector. This will in turn increase the sources of investment in the financial market.

1.3 The need for a household survey

In order to formulate economic policy, the government needs to have accurate data and information on the current household activities in the economy. One approach to collect this information is through a direct survey. In Indonesia the saving and investment household survey is conducted to determine behaviour of households in consuming goods and services and saving their income. Through this survey the available data about individual saving can be obtained in detail, such as the saving rate (the flows) from many sources of income in economic and non-economic activities and how much of its accumulated value of past saving (the stock) is used in investment.

In Indonesia, the saving and investment household survey (the survey) is mainly aimed at constructing the household account as a key component of the system of national accounts in Indonesia, as households have the most significant role in Indonesian economy (70% of GDP is due to household consumption). Moreover, the household accounts can help to reconstruct other accounts that reflect or relate to household behaviour, such as the household component of GDP, the flow of funds, the social accounting matrix, and other socio-economics analysis.

The purpose of the survey is as follows:

1. To identify the household behaviour in consuming goods and services and saving their income.
2. To construct the household balance sheet in addition to other balance sheets (monetary authority, banks, government and enterprises).

2. Methodology

2.1 Data coverage

The 2006 survey will be conducted in ten different provinces and spread over both urban and rural areas. The sample size for this survey is approximately 5,000 households which are selected by stratified random sampling. The sample was spread out over 10 provinces - Riau, South Sumatra, West Java, DKI Jakarta, Central Java, DIY, Bali, West Borneo, North Celebes, and Central Celebes.

The data used in this paper were obtained from the 2003-2004 survey, since data from the 2006 survey were not available yet. The 2004 survey, the sample is about 3,760 households higher than one in 2003 (3210 households) spread over eleven different provinces - Jambi, Lampung, Jakarta, West Java, Central Java, Yogyakarta, East Java, East Nusa Tenggara, South Borneo, East Borneo, South Celebes. The 2003 survey covered eight provinces- West Sumatera, West Java, Central Java, South Celebes, Southeast Celebes, West Borneo, North Borneo, and East Nusa Tenggara.

2.2 Data sampling

The Sample of 2006 survey is a selected census block in Economic and Social National Survey (SUSENAS) 2005, which differs between rural and urban areas and in regions of the selected areas.

2.3 Sample diagram

The diagram of the 2006 survey consists of two steps:

- In the sample frame, we choose a census block by systematic random sampling. The sample of the 2006 survey is a sub-sample from a census sample block in SUSENAS 2005.
- From the selected census block, a sample of 15 households will be taken systematically from different levels of income that have been listed in SUSENAS 2005.

2.4 Data collection method

Data and information will be collected through the direct interview method. However, additional general information can be obtained from other individual respondents within the same family/household.

2.5 Questionnaire draft

Saving is defined as revenue subtracted by expenditure. In this respect, the source of income and expenses will be explored through this survey. Furthermore, the savings rate can be identified as direct investment since part of this income can be invested in assets such as production factors and construction and financial investment in the form of savings accounts or marketable securities.

Households comprise different types of individuals with different income and consumption levels. Consumption behaviour can differ widely between households or can be very similar. Likewise, household incomes can be earned in many different ways, from salaries/wages or as surplus from ownership of factors of production. Therefore, taking into consideration these differences, several constraints need to be applied in order to measure the exact rate of income and expenditure; for instance, besides aggregate household expenditure, the individual expenditures should be recorded separately. Similarly the aggregate household income as well as individual incomes should be separately recorded. In order to do so, the questionnaire, has provided for three kinds of blocks:

- Income block: Captures all the sources of income for each individual in one household
- Expenditure block: Captures the different types of expenditure separately: consumption expenditures and property payments.
- Investment block: The accumulation of past savings can be invested in the form of housing, land and other marketable financial assets, such as securities and stocks.

2.6 The usage of household survey

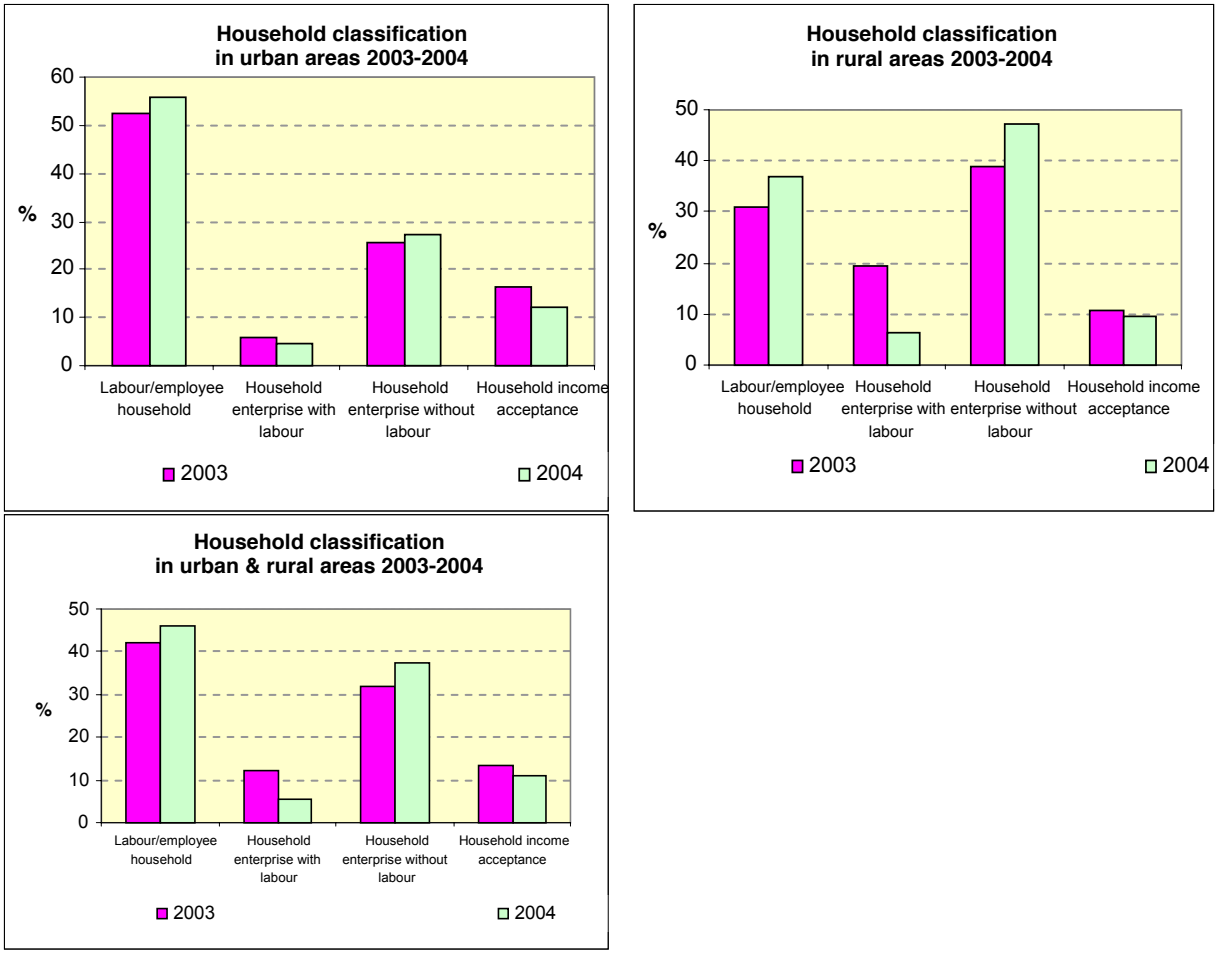
The household survey is aimed at obtaining the structure of income and expenditure of households. This structure will be embedded both in the flow of funds account and social accounting matrices, especially to fill the household transactions. Currently, the Central Bank of Indonesia and Statistics Indonesia are cooperating in an effort to develop Financial Social Accounting Matrices (FSAM). The matrices are basically developed by combining flow of funds and social accounting matrices. Based on the availability of data, including the household survey, the FSAM is developed as a 77 X 77 matrix.

3. Survey results

3.1 Households

There are four types of households classified on the basis of income source of the household: households with the highest share of income from salaries/wages, households with labour deriving their highest share of income from their own business, households without labour deriving their highest share of income from their own business, and households with income from other sources.

Figure 1



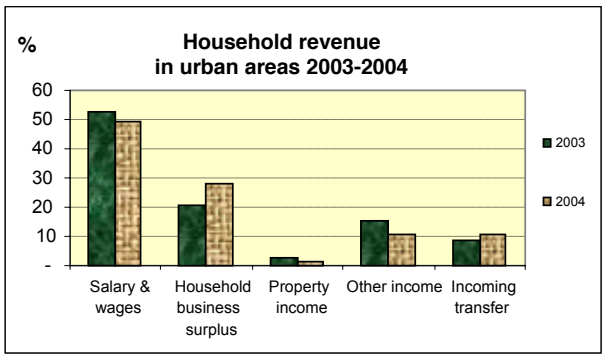
Source: Central Bureau of Statistics (BPS), Indonesia.

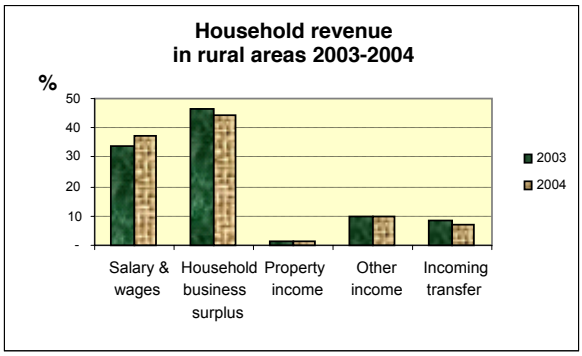
The 2003 and 2004 surveys indicate that there is an increase in labour and employee households both in rural and urban areas. On the other hand, there is a decrease in types of household income acceptance both in rural and urban areas.

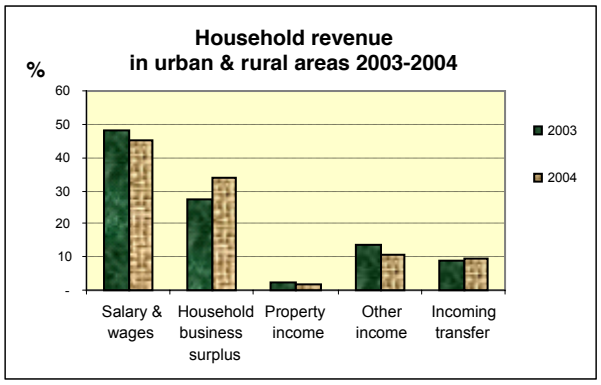
3.2 Household income

The increase in accumulation of past saving (simply called wealth) of individuals within a household will increase the aggregate income of the household itself. Income which is obtained from each individual will be computed to obtain the total income of the household.

Figure 2





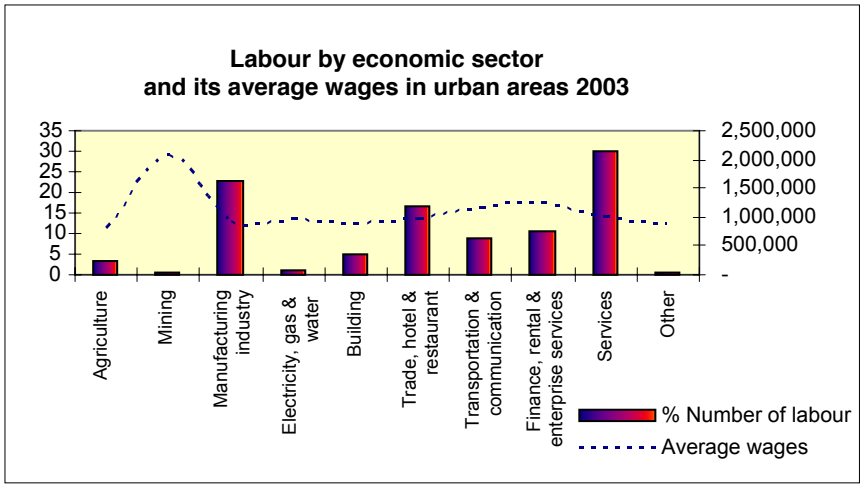


Source: Central Bureau of Statistics (BPS), Indonesia.

In urban areas, the highest household income source is salaries/wages, in comparison to rural areas, where the highest household income source is the surplus from own private business. However, this composition changed slightly between 2003 and 2004. For instance, the percentage share of salaries/wages in urban areas fell from 52.9% in 2003 to 49.3% in 2004. Similarly, in rural areas, the percentage share of surplus from private business decreased from 46.6% in 2003 to 44. 2% in 2004.

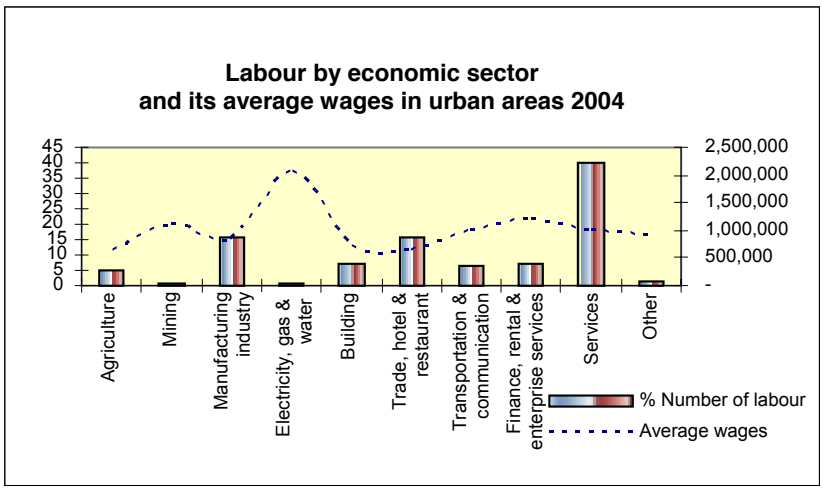
In 2004, based on economic sectors, employment in urban areas was concentrated in services (40.2%), trade, hotel and restaurant (15.8%), and manufacturing (15.65%).

Figure 3



Source: Central Bureau of Statistics (BPS), Indonesia.

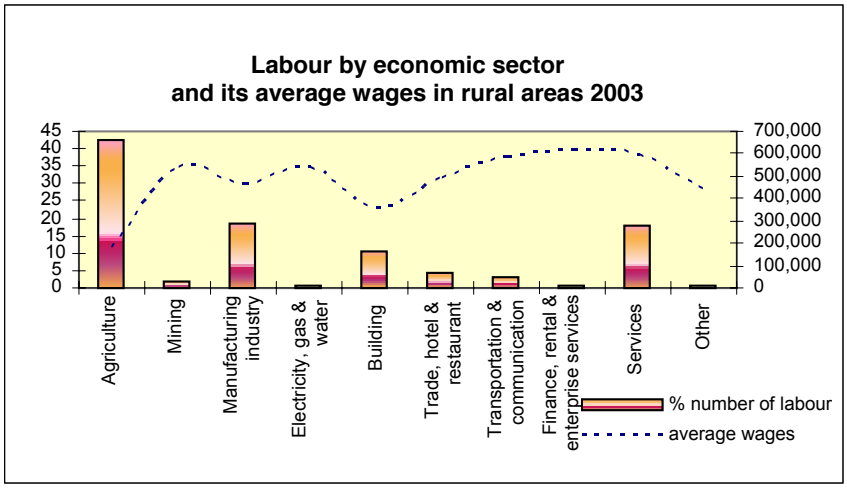
Figure 4

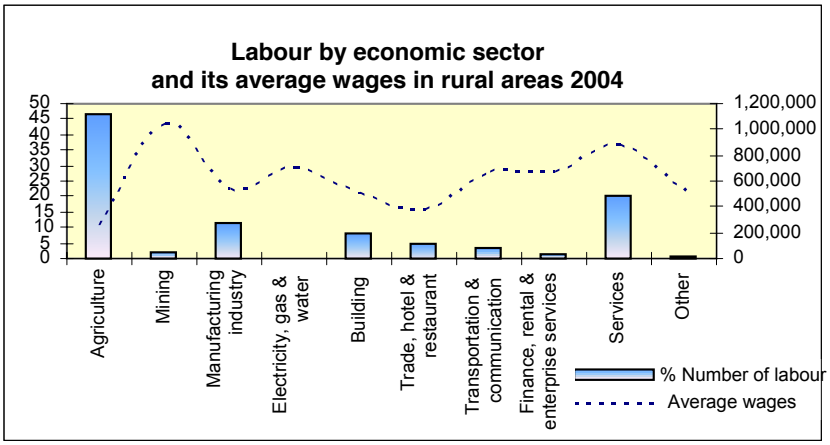


Source: Central Bureau of Statistics (BPS), Indonesia.

Meanwhile, in 2004 employment in rural areas was concentrated in agriculture (46.7%), which was higher than in 2003 (42.25%).

Figure 5





Source: Central Bureau of Statistics (BPS), Indonesia.

3.3 Household expenditure

Household expenditure comprises of consumption and transfers, with the rest of household income going into saving.

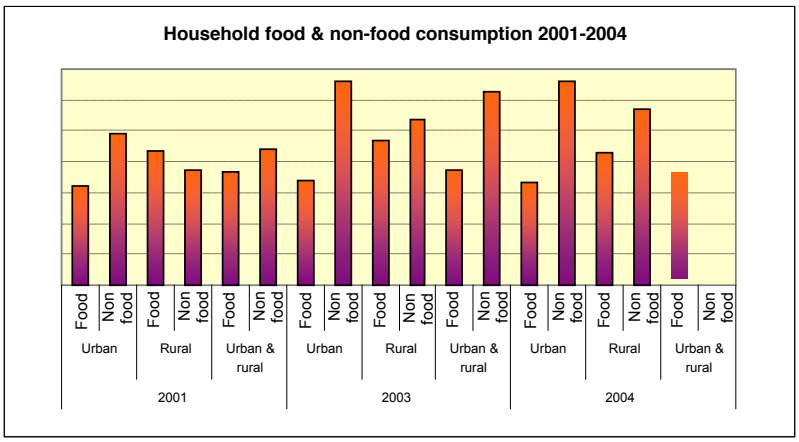
Table 1

Household expenditure 2003-2004		
Urban	**2003**	**2004**
Consumption	**72.76**	**72.74**
Durable goods	4.03	4.93
Property income	0.10	0.46
Outgoing transfers	4.55	5.34
Saving	18.56	16.53
Rural		
Consumption	**73.28**	**72.30**
Durable goods	4.83	7.61
Property income	0.67	0.49
Outgoing transfers	5.22	4.26
Saving	16.00	15.34
Rural & urban		
Consumption	**72.89**	**72.58**
Durable goods	4.23	5.89
Property income	0.24	0.47
Outgoing transfers	4.72	4.95
Saving	17.91	16.10

Source: Central Bureau of Statistics (BPS), Indonesia.

Similar to the previous year, consumption expenditure in 2004 accounts for 72.58% of total household expenditure; this is the largest share of household expenditure, for both urban and rural areas. The next largest share of household revenue is allocated to saving.

Figure 6



Source: Central Bureau of Statistics (BPS), Indonesia.

In 2004, expenditure on non-food consumption in urban areas accounted for 66.23% of household expenditure, while in rural areas it accounted for 57.02%. As a part of non-food expenditure, housing and transportation accounted for 25% and 8.46% of the household income respectively.

3.4 Household saving and investment

The sources of funds for households' investment include saving, transfer, and depreciation.

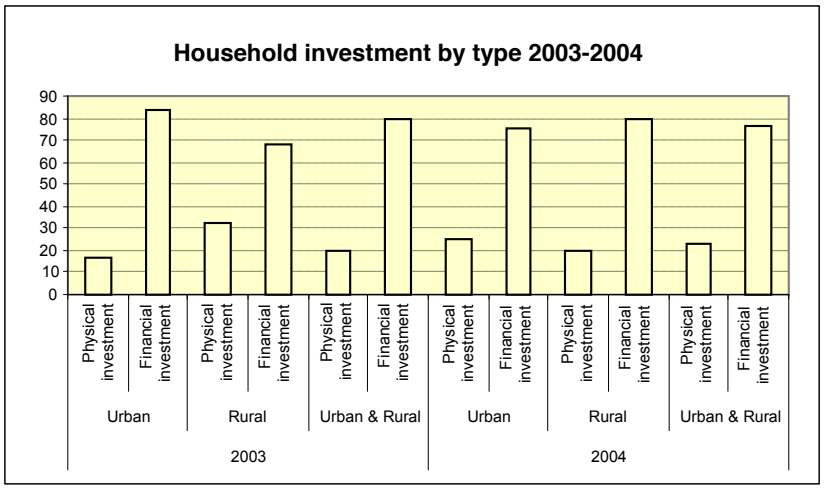
Table 2

Source of household investment	2003	2004
Urban		
Capital depreciation	4.29	7.29
Net capital transfers	3.78	6.61
Saving	91.93	86.10
Rural		
Capital depreciation	14.6	6.4
Net capital transfers	2.4	0.5
Saving	82.9	93.0
Urban & rural		
Capital depreciation	6.84	7.01
Net capital transfers	3.44	4.63
Saving	89.71	88.36

Source: Central Bureau of Statistics (BPS), Indonesia.

Overall, saving is the largest source of funds for households' investment, which accounted for 88% of the investment in 2004. Households' investment include both fixed and financial investment.

Figure 7



Source: Central Bureau of Statistics (BPS), Indonesia.

By type of investment, the largest is financial investment, which accounted for 76.63% in urban and rural areas in 2004. Households' fixed investment in 2004 was 23.37%, which is higher than that in 2003 (20.23%).

The households' physical investment is largely in the form of fixed capital formation, which accounted for 16.87% in 2004. In urban areas 10.5% of fixed capital formation was in housing, while in rural areas 7.93% of fixed capital formation was in production equipment. The changes in stock and procurement of production equipment only took place in the households that owned business enterprises. Changes in households' stock include changes in inventories. Since not all households own business enterprises, overall changes in stock account for only 6.5% of total investment in rural and urban areas.

Table 3

Investment by type	2003	2004
Urban		
Physical investment	**16.50**	**24.99**
Stock changes	5.51	6.38
Gross fixed capital formation	10.98	18.62
* Production equipment	2.07	3.36
* Building	6.77	10.50
* Building & residential facilities	0.27	1.44
* Land	1.88	3.28
* Gold	-	0.04
Financial investment	**83.50**	**75.01**
Subtotal		
Rural		
Physical investment	**32.32**	**20.09**
Stock changes	11.87	6.76
Gross fixed capital formation	20.45	13.33
* Production equipment	8.86	7.93
* Building	8.66	4.73
* Building & residential facilities	0.43	0.62
* Land	2.63	0.04
* Gold	(0.13)	0.01
Financial investment	**67.68**	**79.91**
Subtotal		
Urban & rural		
Physical investment	**20.23**	**23.37**
Stock changes	7.01	6.50
Gross fixed capital formation	13.21	16.87
* Production equipment	0.04	0.05
* Building	7.21	8.59
* Building & residential facilities	0.30	1.17
* Land	2.06	2.21
* Gold	(0.03)	0.03
Financial investment	**79.77**	**76.63**
Subtotal		

Source: Central Bureau of Statistics (BPS), Indonesia.

4. Problem identification

Although, ideally, the survey respondents should include all types of households including domestic households as well as households that reside abroad, the current saving and investment household survey only covers domestic respondents. The sample size is only 5,000, which is very small relative to total households in Indonesia of 55 million. This could result in large sampling errors. Moreover, the sample respondents, which are mostly lower middle class households, make the sample less representative of the population.

In general, households do not keep records of their financial transactions. This may result in incomplete information on transactions. Some households are reluctant to give information on their financial investment which can be attributed to the fear of tax examination. Some of indebted households are also reluctant to give information on their financial transactions to avoid the embarrassment of being seen as indebted. Furthermore, not all households in the sample can be contacted due to the lack of funding and time, thereby not capturing all financial transactions. Moreover, questionnaires have some questions that could be interpreted in different ways leading to a possibility of inaccurate information.

5. Conclusion

1. The household survey is very important to effectively provide information for monetary policy decisions by assessing the situation of household saving and the household debt channel.
2. Statistical coordination between the Central Bureau of Statistics (BPS) and Bank Indonesia is increasingly required in enlarging the sample size, enhancing the timeliness and the coverage of the survey.
3. In Indonesia, a household survey is essential to construct the household balance sheet and to support the joint construction of the Financial Social Accounting Matrix (by Bank Indonesia and the BPS).

The financial position of households after a macroeconomic crisis: the case of Argentina[1]

Horacio Aguirre[2]

Introduction

The measurement of households' financial positions is a relatively underdeveloped subject in Argentina[3]. Although a nationwide household survey is conducted on a regular basis since the mid-1970s, only very recently questions related to financial aspects have been included in it. Several studies have, either from specific surveys or from indirect sources, attempted at determining the main features of households' wealth - or, rather less ambitiously, private sector wealth. The issue has become all the more relevant after a decade of deep macroeconomic reforms and the crisis that followed, both from analytical and policy perspectives. Analysing how household wealth was affected, and what the responses of households to the new situation were, can lead to a better understanding of their financial behaviour, and thus to better policy design - particularly as regards measures aimed at improving households' access to financial services.

This note approaches the main issues faced when trying to determine the financial position of households in Argentina, with emphasis on behaviour before and after the crisis. In section I, a brief review of the macroeconomic and financial aspects of the crisis is provided. In section 2, the main features of households surveys in Argentina are reviewed, as well as those of other, indirect sources of data that help determine aggregate private sector financial position. Section 3 reviews studies that have aimed at portraying household/private sector responses to the crisis. This is complemented by central bank data on financial assets and liabilities, as well as data from household surveys. Section 4 concludes with a preliminary assessment of the situation, as well as with guidelines for future research.

1. The macroeconomy: reform and crisis

An analysis of the Argentine experience in the 1990s is well beyond the scope of this note: only a few features will be noted here that are relevant to our aims. The 1990s witnessed the initially successful implementation of a series of macroeconomic reforms, led by a currency board (the so-called "Convertibility") that pegged the local currency to the dollar on a one-to-one basis from 1991. Reforms included privatizations, commercial and capital account

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[1] Note prepared for presentation at the Irving Fisher Committee Conference on "Measuring the Financial Position of the Household Sector", B.I.S., Basel, August 30 and 31, 2006. The author is indebted to Alejandra Anastasi for helpful comments and suggestions, as well as advice on data sources; and to Ricardo Bebczuk, Pedro Elosegui, Federico Grillo, Javier Ibarlucia, Gastón Repetto, Máximo Sangiácomo, and Facundo Crosta, for advice on data sources. All views expressed are the author's own, and do not necessarily reflect those of the Central Bank of Argentina.

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[3] This is the case in many developing countries; see Honohan (2006).

liberalization, and deregulation in key sectors of the economy, including financial services[4]. The successful stabilisation of consumer prices, the main explicit aim of the peg, led to the economy becoming re-monetized - especially as regards financial intermediation (figures 1a and 3a).

Credit also re-emerged, as a consequence of several factors. On the one hand, newly regained stability gave agents a longer planning horizon, something that stimulated both demand and supply of funds. In addition, the lifting of all restrictions on the capital account, together with the ambitious privatization program, entailed massive capital inflows. As the currency board explicitly permitted the adoption of contracts in either pesos or US dollars, a substantial fraction of both deposits and credits was denominated in the latter currency: in a very "stylized" way, it can be said that the local currency was mainly used for transactions, and the US dollar for savings and loans. As a result of longer planning horizons, a currency in which longer contracts could be made, and abundant supply of funds, credit increased in both amount and term. In particular, long term credit such as mortgage loans reappeared after decades. This, however, happened at the cost of increased financial dollarization (figures 1a and 1b).

The private sector, thus, became progressively indebted in foreign currency, even if, on aggregate, its revenues were denominated in pesos. As will be discussed later, the private sector kept a very significant share of its portfolio in US dollars; the government also became progressively indebted in foreign currency. Notably, both private and public agents displayed behaviour that seemed to consider that favourable conditions would last indefinitely. But the dense contract network that developed was too closely dependent on certain "states of nature"[5]: in short, contracts could only be fulfilled if capital inflows, and thus the real exchange rate, continued at the pace and level seen in the first half of the 1990s.

At the same time, reforms went hand in hand with notorious deterioration of income distribution and a significant increase in poverty. Inequality in income distribution has been on the rise since the mid 1970s, when the first household survey was conducted; and while "peaks" in its deterioration have had to do with macroeconomic crises (in the early 1980s, the late 1980s, and the early 2000s), the trend seems to be associated with episodes of reforms, financial and commercial liberalization and weakening of labour institutions (in the second half of 1970s and in the 1990s). Recent studies suggest that this has to do with a strong reduction in unskilled and semi-skilled labour demand, mainly as a consequence of new technologies, together with changes in relative prices against unskilled labour-intensive sectors (Gasparini, 2003). In a short period, companies and government alike introduced new techniques of organization and production, in ways that were biased against unskilled labour. Such changes took place in an abrupt fashion, without government policies aimed at "smoothing" the transition, and in a context of weakening labour institutions. Increasing income inequality was so large that, although the economy grew strongly during the 1990s, poverty soared: headcount ratios went from 20% to 30% between 1992 and 1998, a change that few countries have ever experienced in such a short period of time and during an economic boom.

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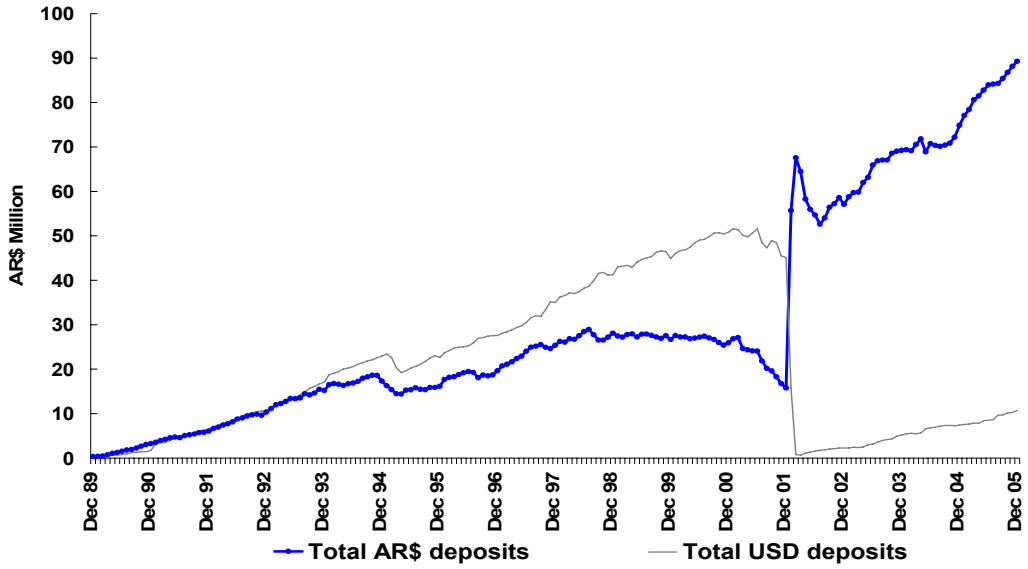
[4] Financial liberalization took place together with the adherence to international banking regulation and supervision standards, such as those embodied in the Basel Committee's "Core principles for effective banking supervision".

[5] See Galiani, Heymann and Tommasi (2003).

Figure 1a

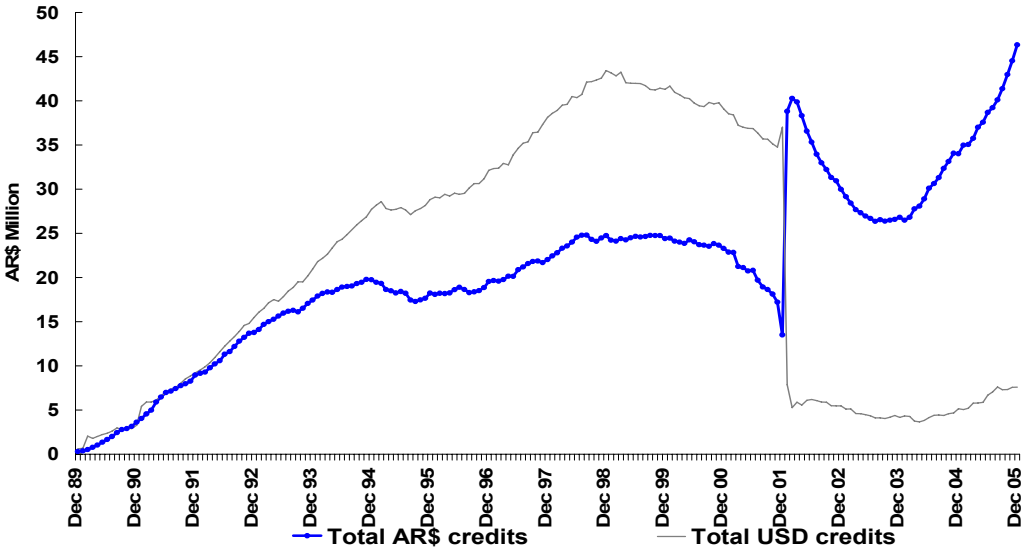
Private sector deposits in financial institutions



Source: BCRA.

Figure 1b

Credit to the private sector granted by financial institutions



Source: BCRA.

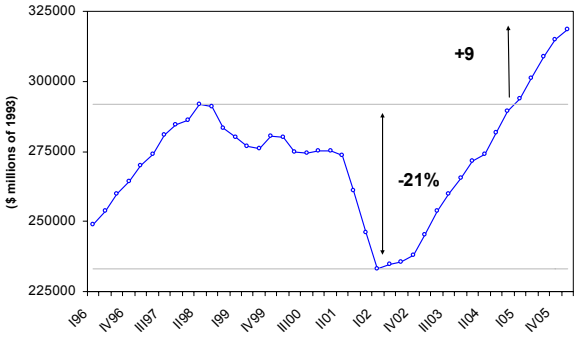
The country entered recession in late 1998; successive emerging economies' crises hit the economy's ability to access foreign financing, and deteriorated its competitiveness. Brazil, Argentina's main trading partner, devalued its currency in early 1999, while the US dollar kept appreciating against the major world currencies, both factors entailing a continuing appreciation of the local currency in real terms. In order to counter that effect, either the nominal exchange rate had to depreciate or productivity had to increase sharply. Productivity certainly increased, but not to the extent that adverse factors required. In addition, the fiscal situation became progressively perceived as unsustainable, in spite of certain efforts of the

government to give signals to the contrary. The icing on the cake came under the form of financial system's implicit currency mismatches, not due to deficiencies in supervision (during the decade, state-of-the-art financial regulation and supervision standards were adopted[6]), but to the intrinsic mismatch generated by local currency income earners becoming indebted in foreign currency. The combination of an adverse external environment (with sudden scarcity of foreign funding), a deteriorating fiscal position that spilled over to the banking system (as the government looked to banks and pension funds for increasingly scarce funding), and the currency "mismatch" ultimately triggered a run against the financial system and the currency. That run resulted in the imposition of financial restrictions, the default on government and private debt in late 2001, and the devaluation of the peso in early 2002.

The ensuing crisis was the most severe in the country's recorded history, with GDP plummeting by 15% in four quarters, thus deepening the already negative trend it showed since 1998 (figure 2). The crisis dealt a hard blow to the whole economy. As a dense network of contracts had been generated on the basis of the one-to-one peg to the US dollar, the devaluation meant the breaking up of innumerable arrangements: from big companies' commercial paper to family house rentals and loans. This effect was particularly acute when it came to the banking sector, which suffered the simultaneous effects of a run and of very strict financial restrictions aimed at stopping foreign currency outflows.

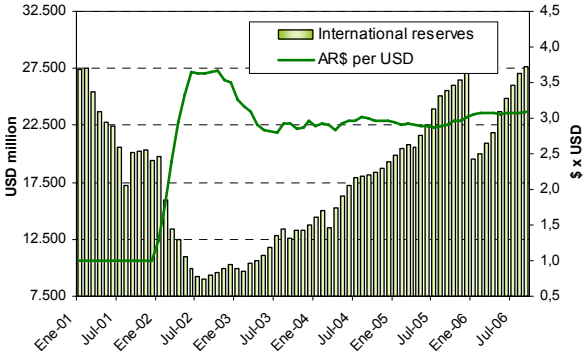
Figure 2

Real GDP



Source: Based on INDEC data.

Foreign exchange rate and international reserves



Source: BCRA.

In a very simplified way, private sector's immediate response to the crisis may be described as combining an extremely abrupt liquidation of banking assets, wherever possible, in favour of liquid positions and a simultaneous move towards foreign currency cash holdings. As the crisis unfolded during 2002, other effects became noticeable, namely a steep fall in private indebtedness to both the local and foreign financial system (figure 3b). This took different forms: outright default, restructuring of loans through the so called "asymmetric pesification" (by which, while dollar-denominated deposits were converted to pesos at a 1.4 rate, credits were changed from pesos into dollars at a one-to-one rate[7]), and gradual repayment together

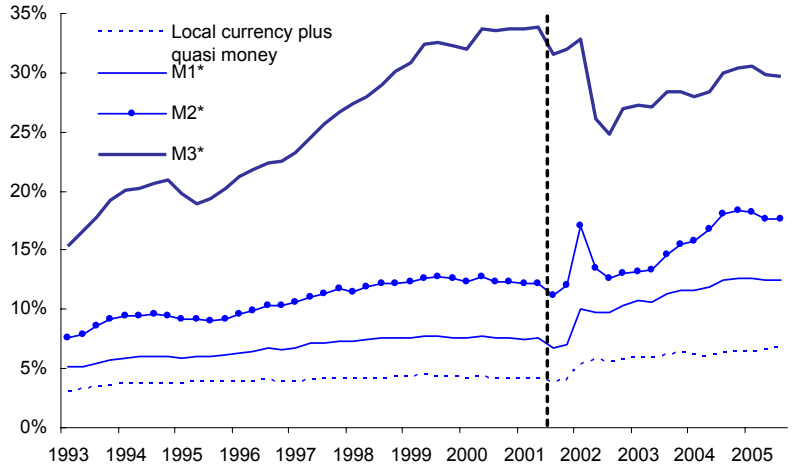
[6] Measures or standards adopted during the 1990s included: minimum capital requirements stricter than those of the Basel accord; consolidated-base banking supervision; debtors rating according to their cash flows; regulations on banks' portfolio diversification; changes to regulation on exit of banks from the financial system.

[7] A difference was made between debt amounts: debts under USD 100.000 were to be adjusted by a wage-linked index, whereas debts over that amount were to be adjusted by a CPI-linked index.

with no new issuance of credit to the private sector during several quarters. At the same time, and not unrelated to financial restrictions, the public remained particularly liquid; this effect may be also associated to the sharp increase in income distribution inequality after the crisis. Such "liquidity preference" has become prevalent throughout the economy, both in the private and the public sector, and shows in a particularly graphic way in monetary aggregates: figure 3a depicts the ratios of such aggregates to GDP; it can be seen that the most liquid forms of money show higher ratios after the crisis, whereas wider aggregates remain "below trend", if we take as such their behaviour during the 1990s.

Figure 3a

Monetary aggregates in terms of GDP (s.a., quarterly)

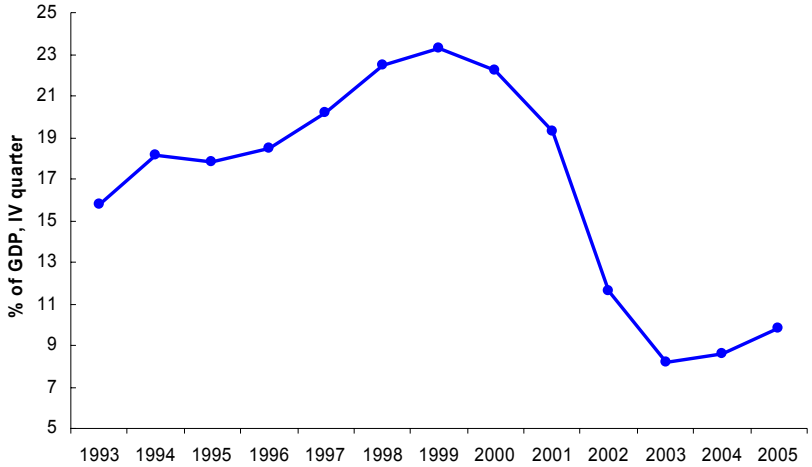


Source: Based on BCRA and INDEC data.

Monetary aggregates are defined as: Local currency plus quasi money = AR$ currency outside banks plus provincial bonds serving as currency. M1* = local currency plus q.m + current accounts in AR$ and USD. M2* = M1* + savings accounts in AR$ and USD. M3* = M2* + fixed time deposits in AR$ and USD. Deposits correspond to total sectors (public + private + financial + foreign residents).

Figure 3b

Banking credit to the private sector



Source: Based on BCRA and INDEC data.

2. What (little) we know about households' financial positions

When trying to measure financial positions of the private sector, two main directions may be followed: measuring directly households' positions, and measuring, at a more aggregate level, private sector's financial position. Regarding the former, it should be noted that no household survey on financial positions has been conducted in Argentina. There are, however, surveys conducted on a regular basis, but mainly aimed at labour and expenditure statistics. As for the latter approach, it could only allow, in an indirect way, to make inferences on household behaviour. In what follows, we review these two groups of data sources.

The *Encuesta Permanente de Hogares* (EPH, Permanent Household Survey) is conducted since 1973 and is the only periodic national household survey, and the main official source on labour statistics; conducted twice a year from 1974 to 2003, it has changed since 2003 to a quarterly frequency. It spans 25,000 households in a rotating panel over 28 urban areas, representing the whole urban population[8]. When household income is measured, certain questions refer very generally to financial income. However, in the new, quarterly version of the Survey, there are somewhat more specific questions pertaining to income derived from deposits in the financial sector, and to loans granted from banks. In particular, under a new section of the questionnaire labeled "household strategies", households are asked if any of their members derived any resources to earn their living from interest on time deposits, or loans from banks or other financial intermediaries - whereas in the previous version of the survey, a more general question was asked. In addition, each member of the family is asked how much of their income came from interests on time deposits.

The *Encuesta Nacional de Gasto de los Hogares* (ENGH, National Survey on Household Expenditure), conducted in 1997 and 2005[9], was designed to measure household expenditure and determine weights on the consumption basket used to measure consumer prices. Once again, certain questions on financial income can be retrieved from the survey, as well as information on household indebtedness. In turn, the Minister of Social Development also conducted household surveys in 1997 and 2001 (Social Development Survey, *Encuesta de Desarrollo Social*), which included questions on credit and income derived from various sources including financial assets.

No overall financial position can be properly determined from these surveys, but only certain aspects related to returns on, or holdings of, financial assets. What is more, except for the EPH, there is no household survey on a periodic basis; and only the most recent version of the EPH may allow the retrieval of certain limited financial information. There have been, however, specific private surveys aimed at obtaining information of, among other things, behaviour on the financial front. This was the case of surveys commissioned by World Bank experts' teams aimed at households' responses to the 2001-2002 crisis (Fiszbein, Giovagnoli and Thurston, 2003), and pensioners' savings.

The second way of approaching the problem has been through the measurement of private sector aggregate wealth. The sources here are manifold, ranging from Central Bank data to national accounts. The Central Bank of Argentina produces three main sets of data: financial institutions' balance sheets and indicators based on them, on a monthly basis; financial institutions selected information on assets, liabilities and interest rates, on a daily basis, compiled in the Central Bank's Statistical Bulletin; and detailed data on individual debtors,

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[8] See INDEC(2003).

[9] Only the 1997 results are partially available.

compiled in the "Central de Deudores" or Debtors' Information Central[10]. These provide data on holdings of deposits and loans of both the private and the government sector in general. Certain items, like deposits and new loans, can be classified within the private sector in those corresponding to individuals and to companies, financial and non-financial; and certain distinctions are possible between different types of banking credits of indivuals, based on the Debtors' Information Central. This allows for an indirect way of computing financial positions of the household sector: although the sector as an aggregate may be captured in this manner, there is no specific way of looking at household behaviour, since the unit of analysis are individuals' accounts - and, in particular, those individuals who have some access to the financial sector.

3. Before and after the crisis: from aggregate to household data

We can have an approximation to the household sector's reaction to the crisis from aggregate data sources, as well as from the household survey's data, as referred to above. Regarding aggregate data, Baer (2005) and Sangiácomo (2006) summarize the main features of private sector behaviour in terms of financial assets and liabilities, based on central bank and national accounts' data.

- The crisis impacted both on the level and on the way in which private sector's assets are accumulated (figure 4). In 1997-1999, the average private sector portfolio measured in US dollars was made up of 46% of foreign assets (including foreign currency, stocks and bonds issued by non-residents, and deposits in foreign countries), 40% of funds deposited in local banks and in institutional investors, and the rest were holdings of other financial assets (including currency, stocks and bonds); in contrast, in 2004, 59% of such portfolio was comprised of foreign assets, only 25% was allocated to deposit-taking institutions, and 16% were holdings of other financial assets.
- The shift from domestic to foreign assets had to do with the loss of confidence associated with the crisis - and is clearly reflected in both the accumulation of private sector foreign assets, and the change in international reserves. While the former increased substantially throughout the 1997-2004 period, it is the 2001-2002 crisis that shows the peaks of foreign assets accumulation. Growing risk perception led to a sudden change in portfolios in favour of foreign assets - which, to a very significant extent, comprised foreign currency bills and notes. This was just the counterpart of the drain of international reserves in the central bank.
- At the same time, private financial assets held in banks fell from over 40% in 2001 to about half that amount in the following three years. Though deposits have slowly recovered, they now are mainly held in local currency and are made at shorter maturities than in the 1990s. This is above all a consequence of transactional deposits, like checking and savings accounts, displaying a higher share of total deposits than fixed time deposits.
- As for private sector's liabilities, perhaps the most salient feature has been the sharp drop in domestic banking credit; there seems to be some connection between the conversion of debts from US dollars to pesos at one-to-one rate, the sharp

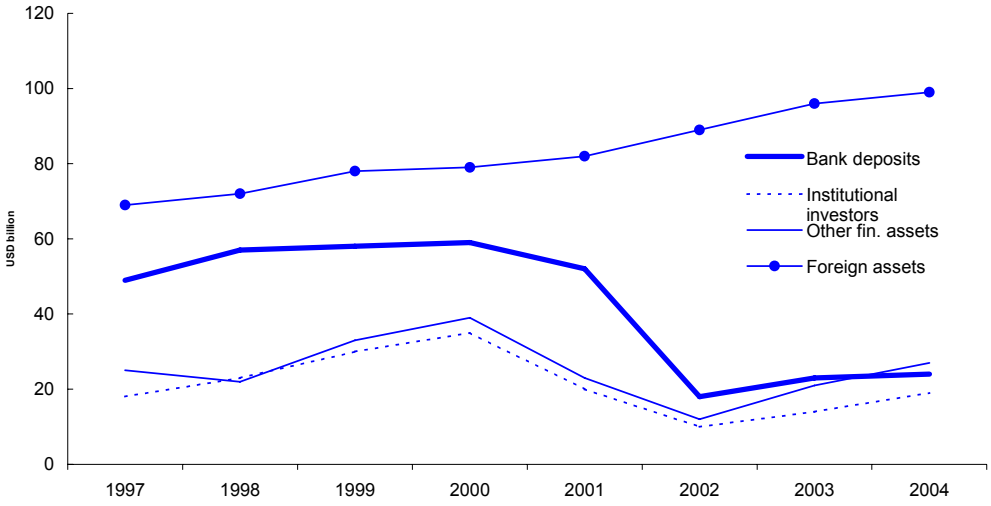
[10] Balance sheet data and the Statistical Bulletin (published monthly) are available on line from the Central Bank of Argentina's website, http://www.bcra.gov.ar Data from Debtors' Information Central is partially available on line on the same site, and a CD can be purchased from the Central Bank with detailed information.

depreciation of the local currency, and the liquidation of private debt (both domestic and foreign). The difference between debts converted into pesos and liquid assets held by private agents and revalued after the devaluation favoured those who were net debtors in US dollars before the crisis, thus making it possible for them to cancel liabilities. At the same time, foreign debt also decreased, although at a more gradual pace: from December 2001 to the end of 2004, the private sector's foreign debt went down by 22%. This stood in contrast with previous behaviour, when foreign assets and debt tended to move together. The decrease of private sector foreign debt took place mainly through creditors' condonation or capitalization, the use of debtors' own foreign funds, and even the transfer of currency from Argentina[11].

- Together with the decrease in banking sector credit, there was a substantial change in the denomination of private liabilities: while over 60% of banking credit was granted in US dollars before 2001, after the crisis loans denominated in pesos amounted to over 80% of banking loans. This was both a consequence of "asymmetric pesification" as well as of the intention to close the significant mismatches originated during the 1990s - when credit was granted to agents whose income was in pesos. Credit granted after the crisis has tended to be in pesos, except for credit lines aimed at financing foreign trade activities. Finally, as in the case of deposits, financing seems to take place at significantly shorter maturities than before the crisis, a common feature among countries that have undergone similar episodes.

Figure 4

Private sector (excl. financial institutions) financial assets



Source: Sangiacomo (2006), based on national accounts and Central Bank data.

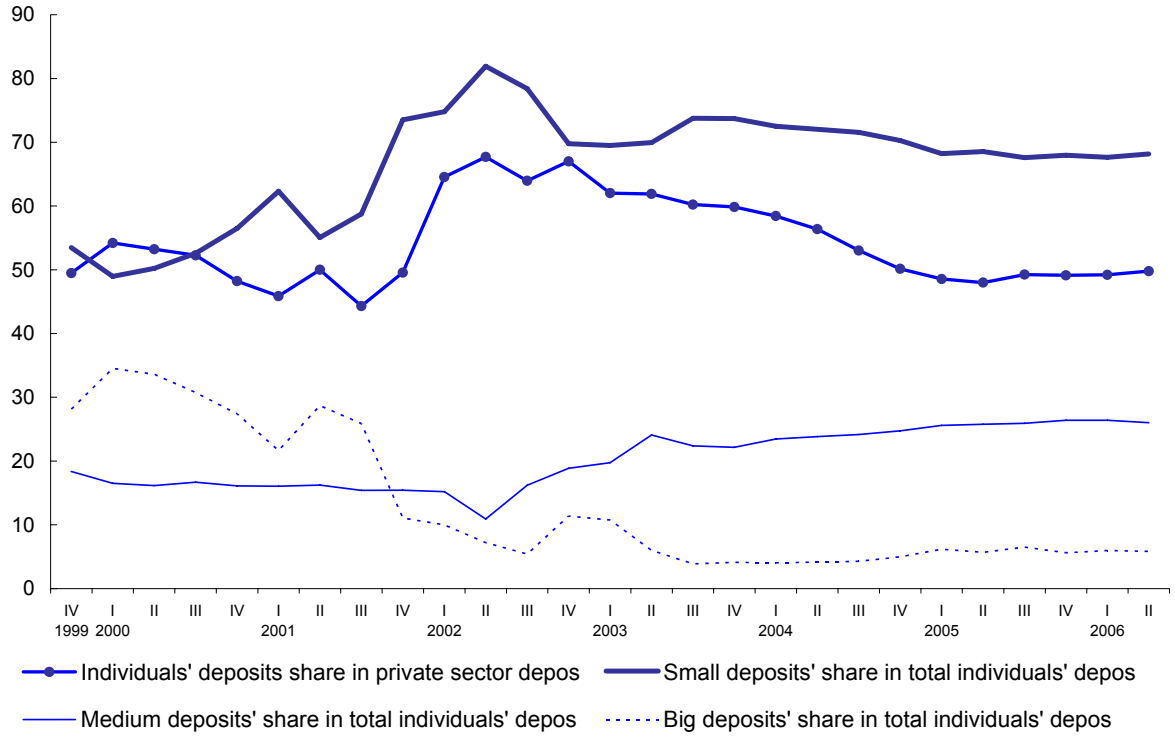
In addition, information from the Central Bank's Statistical Bulletin and Debtors' Information Central can provide insight on individuals' behaviour, as opposed to that of the whole private sector. On the asset side, deposits of "physical persons" or individuals (as distinct from companies), both in pesos and in US dollars, appear rather concentrated in what may be

[11] The Central Bank publishes a report on private foreign debt, available on http://www.bcra.gov.ar under "Statistics: Private foreign debt".

called “smaller” amounts throughout the 1999-2006 period (figures 5a and b): that is, the share of small amounts in the total number of private sector deposits looks quite stable along the years. But the crisis seems to have accentuated this pattern: as noted, banking deposits decreased within the private sector’s portfolio after the crisis, and that they tended to become increasingly denominated in pesos; in turn, smaller inverstors’ share in total individuals’ holdings of time deposits in pesos grew after the crisis, as - although to a smaller extent - it did in the US dollar segment[12]. While some 50% of the total amount of peso time deposits made by individuals were of relatively small amount in 1999, almost 70% fell under that category in 2006 (the same figures for USD time deposits are 70% and 80%, respectively). At the same time, physical persons’ share in both the amount and the number of private sector time deposits in USD substantially decreased after the crisis, while share in the amount of peso time deposits generally increased. Together with shorter maturities in time deposits, individuals seem to be investing significantly smaller amounts by deposit that in the past, and - as aggregate data also show - in domestic currency. All this could be interpreted as the counterpart of individuals’ wealth being allocated to non-banking assets such as cash or foreign currency.

Figure 5a

Share of individual AR$ time deposits in AR $ time depo total amount (private sector - quarterly data)

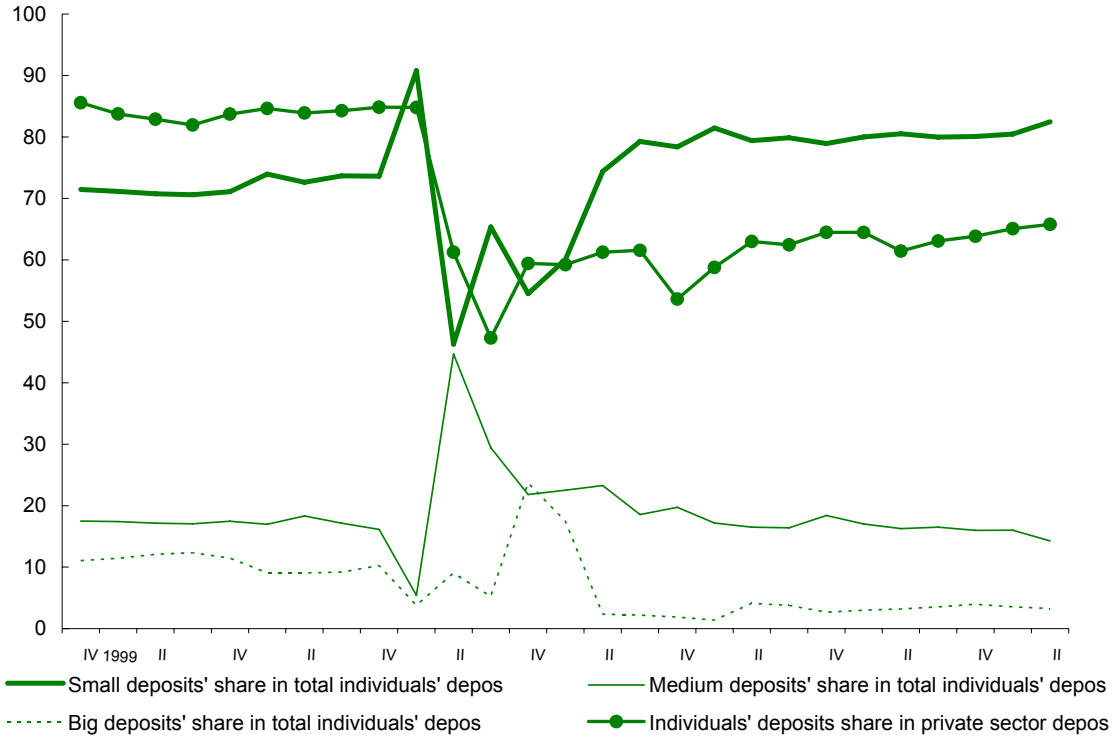


Source: BCRA.

[12] Time deposits are considered a better indicator of individuals’ and households’ savings decisions, while current and savings accounts are mostly held for “transactional” purposes (in Argentina, salaries and wages are paid in savings accounts).

Figure 5b

Share of individual USD time deposits in USD time depo total amount (private sector - quarterly data)



Source: BCRA.

Methodological note: the definition of deposit size is as follows. Small: prinicipal less than AR$ or USD 100.000; medium: principal equal to or higher than AR$ or USD 100.000, lower than AR$ or USD 1.000.000; big: principal higher than AR$ or USD 1.000.000.

In general, data on individuals' savings accounts do not reveal, changes as important: these accounts are mainly open for "transactional" purposes, as formal workers' salaries and wages are paid - by law - in bank accounts. Thus, it is unsurprising that the share of indivuals in peso savings accounts remains relatively unchanged before and after the crisis (see Annex), while this item is dominated by smaller accounts. In turn, individuals' share of US dollar denominated savings accounts - when total amounts are taken into account - only shows a notable change immediately before devaluation, when individuals must have shifted a sizable portion of their banking assets to liquid, foreign currency holdings, as a hedge against exchange rate and banking risk.

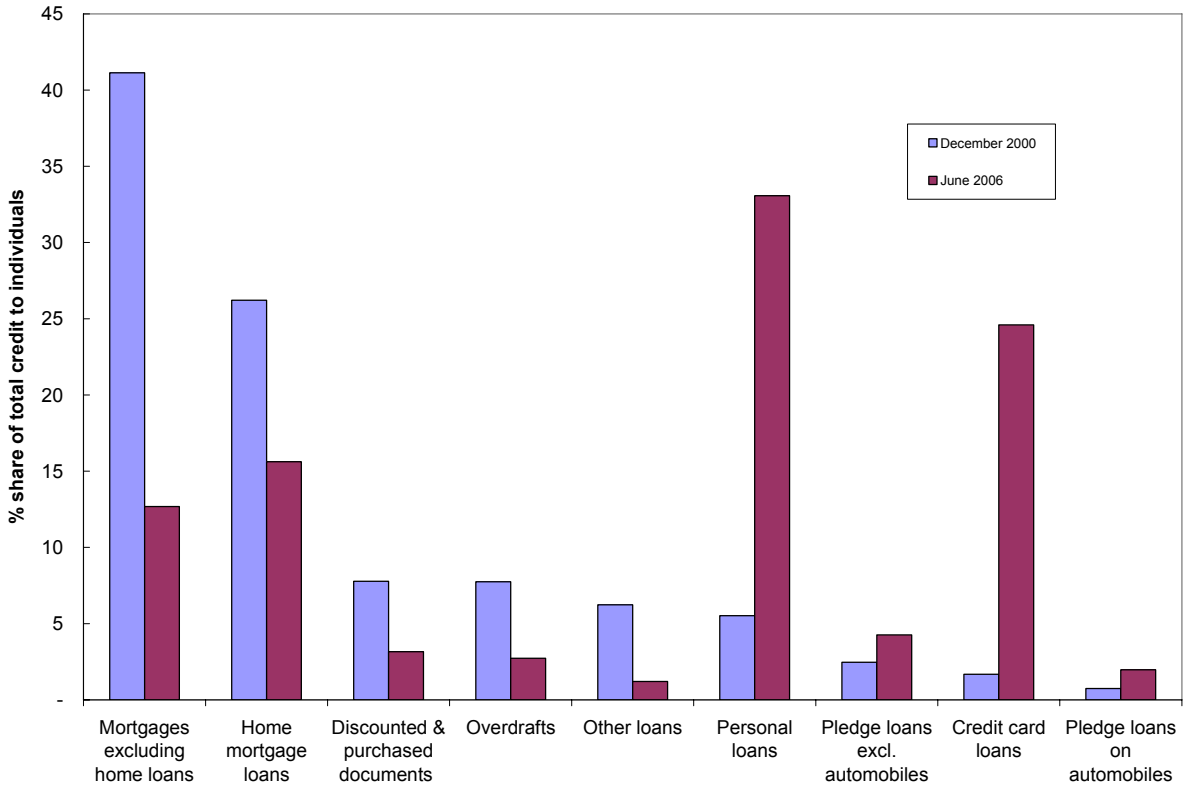
As for the private sector's liabilities, data on the distribution of the different types of individuals' bank loans confirms what was inferred for the private sector maturities in the aggregate. After the crisis, loans of longer maturities, like mortgages, went down significantly, while shorter term loans gained ground (figure 6). This cannot be dissociated from the absence of a "unit of account" for longer terms, and it could also be hypothesized that shrinking credit demand after the crisis has something to do, as well as the banks returning to granting credit to those subjects that show less risk of repayment.

Household survey data provide a depiction along the lines of that portrayed by aggregate information. The most comprehensive and recent coverage is that provided by the Permanent Household survey - subject to the important limitation that financial data has only been gathered after the crisis (figure 7a). It is first of all evident that income derived from time deposits is scarce among households, something that could support the view that

households have relied less, on their asset side, on interest-bearing deposits. As for the liability side, households have progressively resorted to paying in instalments after the crisis - either through credit cards or through informal credit granted by shops. At the same time, there is a small but growing share of households that has been taking credit either from banks or from other type of institutions - questions in the survey do not allow us to distinguish between households obtaining loans from banks, financial institutions or more informal lenders. Going by this data, the point is, once again, that credit looks scarce from the point of view of households, but nonetheless recovering since the crisis.

Figure 6

Individuals' credits from financial institutions - share of total credit to individuals

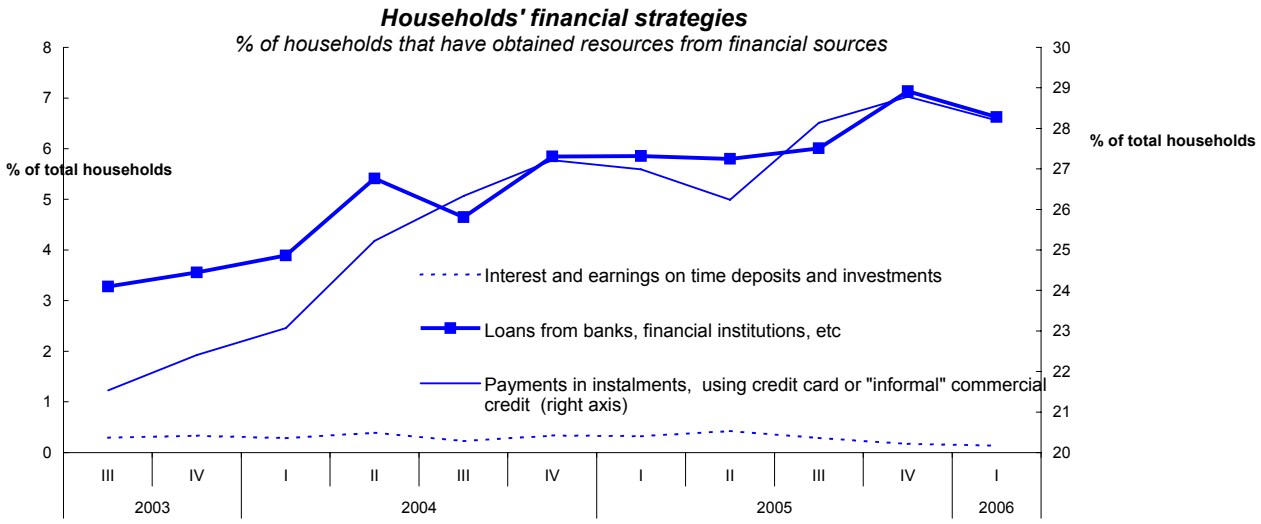


Source: BCRA.

Data from the Permanent Household Survey also show how certain financial resources are distributed according to households' incomes (figure 7b). Interest on time deposits appear extremely concentrated in the upper decile; at most, only 0,3% of households in deciles from the first to the ninth have received such income, as compared to 1,4% in the tenth; the interdecile ratio is above 12. When it comes to loans from banks or other financial agents, the distribution is less unequal - the interdecile ratio is 4.7; this is not necessarily an indication of better access to banking credit than to banking deposits, but rather to the fact that the question includes credit granted by money lenders. Finally, payment in instalments appears more generalized across income deciles, with the interdecile ratio at 2,8 - although we are unable to distinguish the use of credit cards from, for instance, informal instalment payments such as those accepted by local shops. These data suggest that households seem more prone to access financial services in the form of liabilities rather than assets, and that those associated to liabilities, seem less unequally distributed. This may have to do with the fact that, as measured by the survey, financial assets are associated to banking time deposits, while liabilities include other financial intermediaries.

Figure 7a

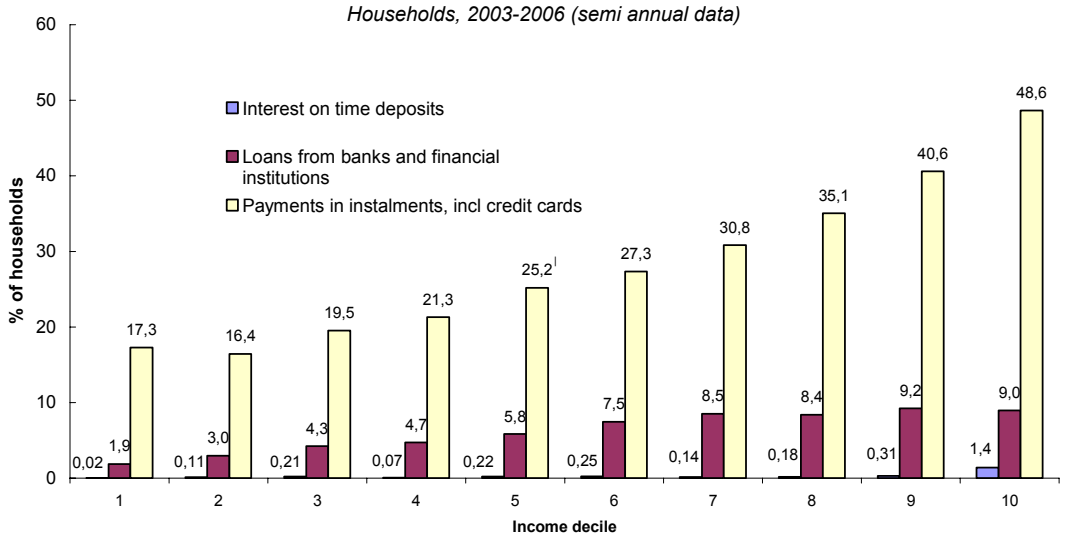
Households' financial strategies



Source: Own estimates based on INDEC data.

Figure 7b

Distribution of financial resources by income decile



Source: Own estimates based on INDEC data.

In turn, the World Bank survey whose results are included in Fiszbein, Giovagnoli and Thurston (2003) covered 2,800 households during June-July 2002, one of the worst moments of the crisis, and was specifically focused on strategies aimed at coping with the event. The financial segment of the survey indicates that after devaluation and default, households' access to banking loans decreased, while plummeting incomes were made up for (at least partially) by selling assets, using saved funds, and recurring to informal credit granted by shops - which was the case of lower-income households (tables 1a and 1b).

Even before the 2001-2002 "multiple crisis" broke out, the long recession undergone since 1998 had put households under great strain; in a report on household coping strategies based mainly on EPH and EDS data[13], a World Bank teams found that families did not, irrespective of their income level, borrow money from the banking system to cover unexpected expenses. While wealthy households responded to negative income shocks selling assets or using savings in a much larger proportion than poorer ones, poor and rich showed the same probability of resorting to banking loans.

Table 1a

Households' financial strategies

Argentina, 2001-2002

	Households resorting to selected strategy (%)		Households that declared income reduction resorting to selected strategy (%)	
	June-July 2002	October 2001	June-July 2002	October 2001
Asset sales	3.7	1.1	5.5	1.0
Use of savings	5.1	3.0	7.1	4.9
Banking loans	1.7	2.4	1.3	3.1
Differed payment purchases	7.3	5.1	9.7	6.6

Source: Giovagnoli, Fiszbein and Alduriz (2002).

Table 1b

Households' financial strategies by income quintile

Argentina, 2002

	Income quintile					
	I	II	III	IV	V	Total
Asset sales	5.9	3.7	3.3	2.7	1.1	3.3
Use of savings	2.8	3.5	4.0	8.0	5.6	4.8
Banking loans	0.9	3.6	1.8	0.6	2.0	1.8
Differed payment purchases	14.6	13.1	9.5	2.3	0.7	8.0

Source: Giovagnoli, Fiszbein and Alduriz (2002).

Finally, data from the Household Expenditure Survey are adequate to focus on housing credit, if only before the crisis. In particular, they show a relatively limited penetration of

[13] World Bank (2001).

housing credit even during a boom phase, and the concentration of such credit in wealthier households. Thus, according to 1997 data, only 3,7% of households in the Buenos Aires metropolitan region[14] declared to hold debt related to house purchases. Although the definition is vague, and may not be taken to strictly represent banking mortgage loans, it can safely be assumed that they represent an important share of housing debt. The distribution of such credit among households appeared concentrated in households belonging to the upper quintiles of income distribution (table 2): while just 1% of households in the first quintile declared to finance home acquisition through some form of credit, 6% of those in the fifth quintile did so. Average financing represented only 13% of average household income in the first quintile, but rose to almost 46% in the fifth[15]. The idea of concentration is reinforced when total declared household debt is compared to total declared income, which yields a ratio of 38%. This follows the usual pattern (in less developed financial markets) of lower access to financial services by lower income households. One point may, still, contrast with unequal access to housing credit: that, when credit is measured as a proportion of income of households that actually declare holding credit, the ratio appears fairly stable throughout income quintiles.

When it comes to other household debt, the situation is somewhat different: throughout the sample, 54% of respondents declared holding some form of debt other than that related to house purchase, and their distribution by income quintile was less unequal (table 2). This may not necessarily reflect a better access to financing, since debts included in this class may range from loans granted by family members or informal networks to formal banking credit, and may include loans granted by lenders other than financial institutions.

Table 2

Households' debt holdings

Shares by income quintile - Greater Buenos Aires, 1997

Income quintile	Housing debt	Other debt
I	1.1%	32.0%
II	1.7%	42.1%
III	3.2%	53.7%
IV	6.2%	64.1%
V	6.5%	78.5%

Income = net household income. Quintiles correspond to regional distribution. Housing debt = debt for home acquisition.

Source: own estimates based on ENGH.

As for possible determinants of these households liabilities, correlations between certain households characteristics and household debt point in expected directions (table 3): the amount of housing debt is positively correlated to the household head labour situation, his or her level of formal training, but negatively correlated to sex. Thus, access to housing credit

[14] The metropolitan region or Greater Buenos Aires (Gran Buenos Aires) spans both the Federal Capital and suburban areas that are politically under provincial jurisdiction, but form the same urban conglomerate.

[15] This should only be taken as a measure of credit penetration, since it is calculated including all households in each quintile, whether they had taken housing loans or not.

seems associated to households facing relatively less vulnerable conditions. As for sex, one should bear in mind that a female household head usually entails a more "risky" situation as women: a) tend to have higher unemployment rates; b) become households heads when the male head is unemployed or absent. In turn, the amount of declared housing credit is positively correlated with household income and expenditure, to the house tenancy regime, and to the fact of already owning other goods, such as a car. Similar results are observed for other types of household debt - in this case, the number of household members is also associated to debt holdings, something that could be in line with "coping strategies" as a household grows bigger.

Table 3

Pairwise correlations: housing debt, other debt, and selected variables

Greater Buenos Aires, 1997

	deud_viv	deud_otr	jnivins	jsitocup	jedad	jsexo	regten	propauto	cantmiem	ingtot	gastot
deud_viv	1,000										
deud_otr	0,028	1,000									
jnivins	0,080	0,122	1,000								
jsitocup	0,024	0,094	0,193	1,000							
jedad	-0,053	-0,062	-0,233	-0,415	1,000						
jsexo	-0,029	-0,048	-0,044	-0,228	0,198	1,000					
regten	-0,042	-0,032	-0,036	0,070	-0,309	*0,000*	1,000				
propauto	0,067	0,151	0,249	0,238	-0,079	-0,251	-0,159	1,000			
cantmiem	*0,005*	0,047	-0,107	0,178	-0,263	-0,287	*0,017*	0,122	1,000		
ingtot	0,123	0,181	0,498	0,228	-0,080	-0,144	-0,134	0,427	0,160	1,000	
gastot	0,093	0,198	0,463	0,205	-0,106	-0,125	-0,100	0,423	0,124	0,802	1,000

Variables significantly different from zero at 10% levels or less shown in bold type. Variable definitions as follows. Deud_viv: debt holdings for house purchase; deud_otr: other debt holdings; jnivins: maximum educational level attained by household head (from 1 = no education to 10 = university degree); jsitocup: household head situation in the labour market (1 = unemployed or inactive; 2 = employed; 3 = self-employed or business owner); jedad: age of household head; jsexo: sex of household head (1 = male; 2 = female); regten: home ownership (1 = owner; 2 = tennant; 3 = occupant); propauto: car ownership (1 = no car; 2 = 1 car; 3 = 2 or more cars); cantmiem: number of household members; ingtot: total household income; gastot: total household expenditure.

Source: Own estimates based on ENGH.

Analysing the determinants of household debt is well beyond the scope of this note, but the point is that, even during a relatively favourable economic phase, when credit was growing and, for the first time in decades, reaching significant levels in terms of GDP, there is reason to believe that longer term credit was still concentrated in few households - a result that could be somewhat related to the general, worsening trend in inequality.

4. Concluding remarks

The 2001-02 macroeconomic crisis took its toll on households' financial positions. The private sector became much more liquid, with a less significant share of both banking deposits and credit, and with higher holdings of foreign assets; and, once recovery was under way, renewed growth in deposits and credits has taken place at shorter maturities - as transactional deposits have carried more weight - and, mostly, in local currency. Individuals seem to have followed the same pattern, and we have reason to believe that, as banking credit was relatively concentrated in few households before the crisis (and even before the

1998-2002 recession started), credit during the ensuing recovery has also been rather concentrated. What is more, while access to longer term banking credit may be taken to be concentrated in the wealthier households, deposits in financial institutions tend to be dominated by relatively small amounts - something that could be taken as evidence that wealthier individual investors abandoned the financial sector.

There is information that can properly describe private sector behaviour, as well as that of individuals' within it; however, sources on household behaviour are still very scarce when it comes to the financial dimension. There are several lines for further research, comprising work on already existing information sources as well as the development of new data.

- In the first place, data on private sector and individuals could be further refined, so that measures of the financial position of the "representative" individual could be obtained[16]. These measures could be analysed together with micro and macroeconomic variables, so as to obtain determinants of private sector and individuals' financial behaviour.
- The structure of existing household surveys could be accommodated so as to include improved information on financial income and expenses. This, of course, would require the coordination of experts from both the National Statistic Agency and the Central Bank.
- Finally, specific households surveys aimed at determining their financial position could be conducted. This, of course, poses the most important challenge, as it involves virtually "starting from scratch".

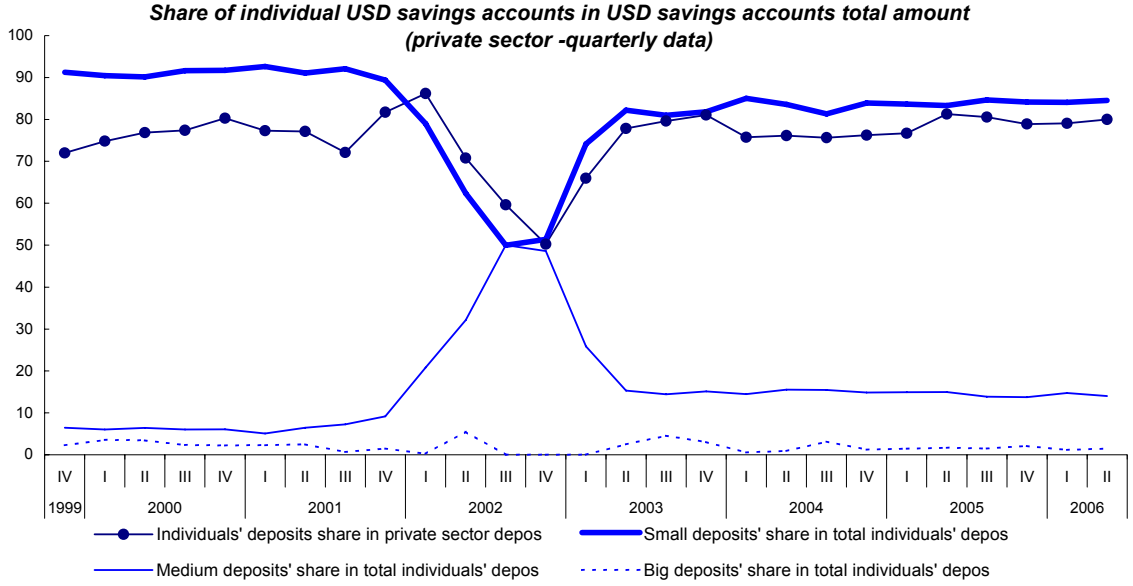
There is question as to whether further work on this subject would be relevant, since aggregate data show that the population's access to financial services remain limited. But it is precisely because of this fact that such a survey would be useful - not in order to determine households' financial position *per se*, but rather to measure their ability to access financial services. In this way, policy measures aimed at improving and extending access to banking services could be taken[17], entailing a more efficient individual and social use of resources - something particularly relevant in an economy that has so far shown a "cash-driven" growth phase after the recession.

[16] Measures of the representative private agent are presented in Baer (2005) and Sangiácomo (2006), as previously discussed.

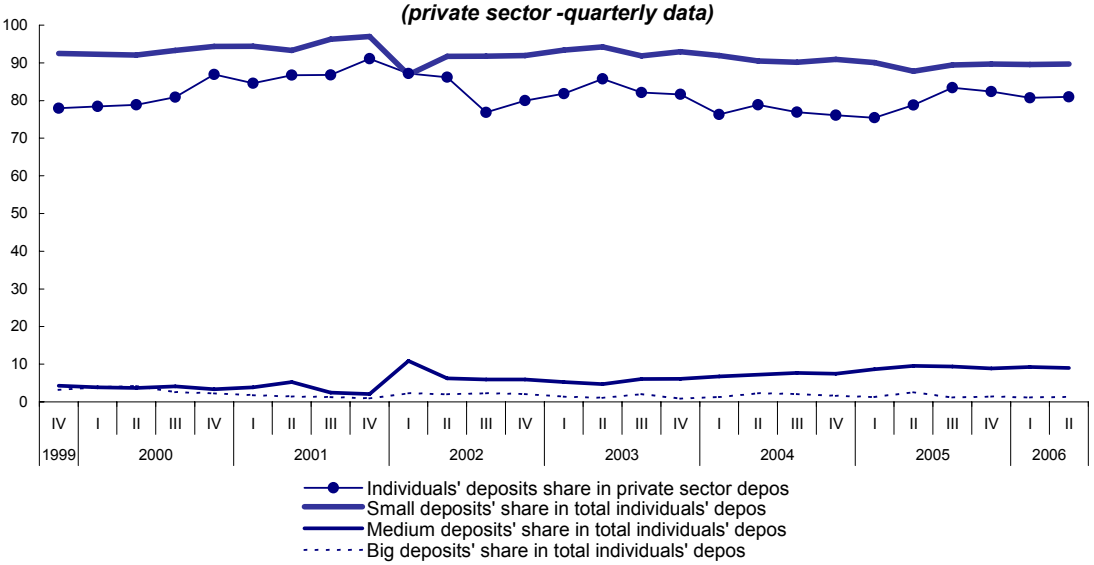
[17] As pointed out by Honohan (2006), deeper financial systems are correlated with improved income distribution.

Annex

Share of individual USD savings accounts in USD savings accounts total amount
(private sector -quarterly data)



Share of individual AR$ savings accounts in AR $ savings accounts total amount
(private sector -quarterly data)



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Glossary

BCRA: Banco Central de la República Argentina, Central Bank of Argentina.

INDEC: Instituto Nacional de Estadísticas y Censos, National Institute of Statistics and Census.

The use of micro-level data from the Bank of Italy's survey of household income and wealth: a focus on household finance

Claudia Biancotti and Giovanni D'Alessio[1]

1. Micro-level data on household finance

The wide access to financial markets currently enjoyed by residents of developed countries is a double-edged sword: compared with their predecessors, contemporary households face both increased opportunities and increased complexity in the field of savings, investments and consumption. On the one hand, virtually everyone can buy and sell stocks, shares of mutual funds, and advanced derivatives; in the long run the availability of a wider range of assets ensures that the individual can achieve a better trade-off between risk and return than with traditional portfolios composed of just bank deposits and treasuries. On the other hand, people need to learn at least something about finance, so that when faced with technically complex decisions about how to secure their pensions, finance the purchase of a house, or set aside something for a rainy day, they are in a position to make reasonably informed choices and, above all, to understand the risks. In view of the rapid technical advances in finance, both individuals and authorities are continuously challenged to keep up with the changes and adapt their behaviour.

Household finance has, as a consequence, taken centre stage in economic research in the last twenty years or so. First of all, one needs to understand the effects exerted by increased financial activity on consumer welfare. Secondly, the macroeconomic impact of monetary policy is determined by how market institutions and individuals react to measures such as rate changes: central banks in particular must be aware of the mechanisms involved. Finally, financial supervisors are also interested in households' perspective on banking and financial markets. Models inherited from the past may not always be up to the task: information sets, attitudes and scenarios change fast, so that news from the front are continuously required to confirm, calibrate and update theories.

Micro-level data derived from household surveys are the main source of such information; they are a powerful descriptive tool, they can be employed in standard regression analysis, they can be fed into simulation models, and their rich multi-dimensionality makes them extremely useful for those who follow the increasingly popular experimental/behavioural approach to economics. For example, micro data have shown that individuals may vary enormously in their risk aversion and intertemporal preferences. Micro-level models have allowed researchers to study how variables as different as an individual's occupational status, social environment and personal values relate to attitudes towards risky assets. The level of education and the degree of information on financial markets may help in understanding the role played by information costs and (subjective) uncertainty in portfolio choice. Often, rationality-based textbook assumptions about the information and behaviour of agents turn out to be wrong even for the supposedly best equipped individuals: ignorance of financial issues is not confined to the uneducated.

The main source for micro data on household finance in Italy is the Bank of Italy's Survey of Household Income and Wealth (SHIW). The rest of this document gives a brief overview of

[1] The views expressed herein are those of the authors and do not necessarily reflect those of the Bank of Italy.

the survey and a sketch of its institutional and research output, with a focus on themes connected with household finance.

2. The Survey of Household Income and Wealth (SHIW)

The Survey of Household Income and Wealth (SHIW) has been carried out by the Bank of Italy since 1965 for the purpose of collecting information on the economic behaviour of households. It was conducted yearly until 1984, then it became biennial. Micro-level data are publicly available starting from the 1977 wave.

The survey has a two-stage sample design. The primary sampling units are municipalities, stratified by region and demographic size. Within each stratum, all municipalities with a population exceeding 40,000 are selected (self-representing units); a sample of smaller towns is then drawn using a PPS (probability proportional to demographic size) scheme. Finally, the households to be interviewed within each municipality are randomly selected from the official registers of residents.

Until 1987, the survey was conducted with time-independent samples, or cross-sections, of households. In order to facilitate the analysis of changes in the phenomena of interest, since 1989 part of the sample comprises households interviewed in previous surveys, known as panel households. In the most recent waves, the sample consists of 8,000 households living in 300 municipalities, drawn from a population of approximately 20 million households living in 8,000 municipalities; the panel component accounts for 45 per cent of the interviewees. Data are collected from the households by a market research firm during face-to-face interviews, lasting on average one hour; the Computer Assisted Personal Interview technology is widely employed.

The questionnaire has a permanent component, designed to collect core information on income, wealth, savings and payments besides demographic data. Along with the permanent items, the questionnaire contains a variable part combining one-shot sections with irregular-frequency sections focusing on specific phenomena. Recent examples are sections on: capital gains, inheritance, risk aversion, housework, intergenerational mobility, use of public services, social capital, tax evasion, income and employment expectations, retirement expectations, financial choices, new technologies. To lighten the burden of the interview, some of the occasional questions are asked only to a random subset of the sample.

3. Quality concerns

Sample estimates are subject to the usual sampling errors. However, in the surveys on income and wealth the estimates may suffer from more specific quality problems.

It is well known, for example, that different segments of the population have different participation propensities, which may lead to biased estimates. To overcome this problem, we developed and applied appropriate weighting schemes.

Moreover, as income and wealth are often perceived as sensitive topics, estimates may be affected by the reluctance of households to report entirely truthfully their sources of income or the real or financial assets they hold. Although participation is voluntary and respondents are informed at the outset about the content of the survey and about the merely statistical use of the data they provide, several studies have shown that some respondents still under-report. Interviewers are asked at the end of the interview to give a brief assessment of the presumed reliability of responses, basing their judgment on a comparison between the information provided and objective evidence available to them: although the level of reliability is satisfactory on the whole, it is not uniform across the sample. Additional elements to

assess the reliability of respondents' replies are obtained by comparing survey estimates with figures from the national accounts. We have also used statistical matching experiments to analyse the under-reporting behaviour of groups of respondents; this has resulted in the introduction of further methodologies to adjust sample estimates for non- and under-reporting.

4. Use and users of the SHIW micro data

The micro-level data gathered in the SHIW are widely used, both inside and outside the Bank of Italy. Internal users employ them mainly in policy-relevant research projects or as a tool for simulating the impact of policy choices via micro-simulation frameworks. Examples include the channels of transmission of monetary policy, the functioning of the banking markets, the analysis of fiscal issues or pension reform. Micro data are also used in connection with the compilation of financial and wealth accounts.

External users range from the general public to academics, from journalists to decision-makers. Following each SHIW wave, a report containing the main results of the survey is compiled and distributed free of charge; it usually becomes an important reference for the domestic political debate on the economic conditions of households.

Anonymised micro data with full methodological documentation are also available on the Internet to anyone who may be interested, at no charge and with only two provisos: data must be used for research purposes only and the Bank should be informed of every survey-based paper that is published.[2] This feedback is the basis for a bibliography of SHIW-related work, which is also provided electronically to the public. In March 2006 it contained 536 published documents, written by 367 different authors over 40 years. The share of internal users is relatively low, at 15 per cent; it is 28.4 per cent in terms of papers.[3]

Figure 1 gives an account of SHIW-based research output published between 1996 and 2006, organized by topic. Unsurprisingly, papers related to income (dynamics and distribution) far outnumber the rest; methodological documents take a distant second place. A large set of papers also looks at the correlations between the demographic structure of households and economic phenomena. Issues relating to fiscal policies, labour market, wealth distribution and saving behaviour also draw interest.

5. Old themes, new themes

The relative importance of research fields changes over time. In the early years, papers mostly concentrated on a few core subjects: income, savings, wealth, fiscal policy. Subsequently, the research has focused on more specific themes, such as uncertainty, poverty, inequality, or retirement plans. Currently, the hottest topics are in household finance: they include (but are not limited to) asset allocation, uncertainty and risk aversion, market structure and imperfections, wealth accumulation, demand for credit, payment technologies,

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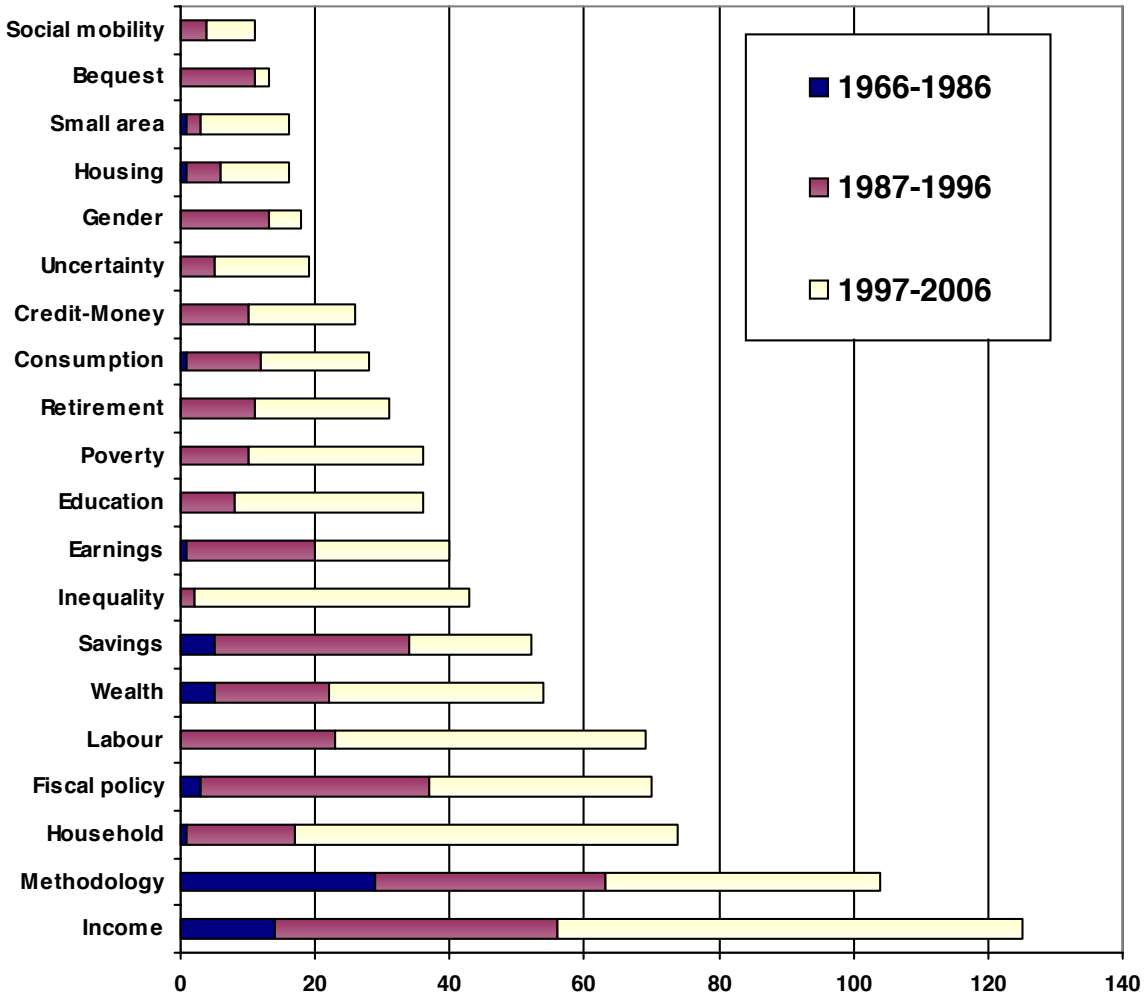
[2] The Internet site of the Bank of Italy has a section devoted to the SHIW, containing the official reports, papers, the bibliography of SHIW-based papers, downloadable micro data, questionnaires and other documents (www.bancaditalia.it/statistiche/consultazione). Most documents are available in English.

[3] This conclusion is stronger if one takes into account the fact that the share attributed the Bank of Italy includes both the reports containing the main results of the survey (30 documents) and several papers documenting the methodological aspects, as opposed to papers that use SHIW data for economic analysis.

and spatial interest rate differentials. The SHIW questionnaire has consistently moved in step with the centrifugal tendency of economic literature. *Ad hoc* sections of the questionnaire have regularly been tailored to the needs of researchers.

Figure 1

Papers based on SHIW data by topic, 1966-2006



6. Some recent research on household finance at the Bank of Italy

The *Temi di Discussione* working paper series, edited by the Bank of Italy and available on the Web at www.bancaditalia.it, routinely features papers that employ SHIW data as a basis for research on household finance.

In recent years, a varied range of topics has been explored. For example, Guiso, Paiella and Visco (2005) investigate whether capital gains affect consumption: they find that homeowners increase consumption when house prices increase, while the renters' response to the higher house cost tends to be that of increased savings.

Brandolini, Cannari, D'Alessio and Faiella (2004) describe the composition and distribution of household wealth in Italy, merging information from aggregate balance sheets with SHIW data in order to provide estimates that are adjusted for non-response, non-reporting and

under-reporting. They find that wealth inequality has risen steadily during the 1990s; the increased concentration of financial wealth was an important factor in determining this path.

Ando and Nicoletti-Altimari (2004) use the SHIW to estimate a number of parameters for a dynamic microsimulation model aimed at studying the evolution of aggregate income, saving and asset accumulation over the period 1994-2100.

Guiso and Paiella (2005) construct a direct measure of absolute risk aversion based on a survey item recording the maximum price that a consumer is willing to pay to buy a risky asset. They find that elicited risk aversion has considerable predictive power for a number of key household decisions such as choice of occupation, portfolio selection, moving decisions and exposure to chronic diseases in ways consistent with theory.

7. Conclusion

In this note we have provided a brief description of the Bank of Italy's Survey of Household Income and Wealth, and outlined how the data collected in the survey are used in the analysis of household finance.

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