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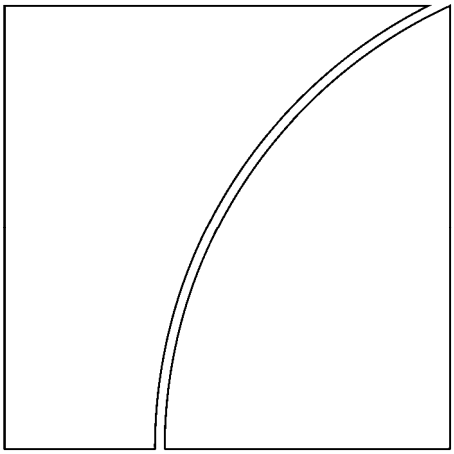

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Household debt: implications for monetary policy and financial stability

Proceedings of a joint conference organised by the BIS and the Bank of Korea in Seoul on 28 March 2008

Monetary and Economic Department

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Foreword

Since its launch in September 2006, the Asian Research Programme has focused on policy-oriented studies for central banks and supervisory authorities in the Asia-Pacific region. Under the programme, the BIS Representative Office for Asia and the Pacific has co-organised a series of conferences, seminars and workshops with central banks and supervisory authorities in Asia and the Pacific. The subjects of interest have included improving monetary policy and operations, developing financial markets, maintaining financial stability and strengthening prudential policy.

On 28 March 2008, the BIS Asian Office and the Bank of Korea jointly organised a seminar on household debt in Seoul. Participants from 11 central banks and the BIS attended the seminar, which was structured along the following themes: (1) mortgage finance; (2) consumer credit; (3) securitisation; and (4) policy challenges. This volume is a collection of the speeches, presentations and papers of the seminar.

Programme

Thursday 27 March

19:00	Welcome dinner hosted by the BIS

Friday 28 March

Introductory session	***Opening remarks***
09:00–10:00	Seongtae Lee, Governor, Bank of Korea
	Robert McCauley, Chief Representative, BIS Asian Office
	Keynote speech
	Eric Rosengren, President, Federal Reserve Bank of Boston
Session 1	***Mortgage finance***
10:00–11:15	(Chaired by Made Sukada, Bank Indonesia)
	Presenters:
	Shen Bingxi, People's Bank of China
	Malvika Sinha, Reserve Bank of India
	Tientip Subhanij, Bank of Thailand
11:15–11:45	Coffee break
Session 2	***Consumer credit***
11:45–13:00	(Chaired by A B Chakraborty, Reserve Bank of India)
	*Presenters**:***
	Taesoo Kang, Bank of Korea
	Wimboh Santoso, Bank Indonesia
	Winecito Tan, Bangko Sentral ng Pilipinas
13:00–14:00	Lunch hosted by the BIS
Session 3	***Securitisation***
14:00–15:15	(Chaired by Yangwoo Kim, Bank of Korea)
	Presenters:
	Norhana Endut, Central Bank of Malaysia
	Michael Davies, Reserve Bank of Australia
	Richard Peach, Federal Reserve Bank of New York
15:15–15:45	Coffee break

Session 4	***Policy challenges***
15:45–17:15	(Chaired by Eli Remolona, BIS)
	Presenters:
	Shinobu Nakagawa, Bank of Japan
	Kyuil Chung, Bank of Korea
	Mattias Persson, Sveriges Riksbank
	Andrew Filardo, BIS
Wrap-up session	
17:15–17:30	
19:00	Dinner hosted by the Bank of Korea

Participants in the meeting

Reserve Bank of Australia	Michael Davies Domestic Markets Department
People's Bank of China	Shen Bingxi Financial Market Department
	Yan Lijuan Financial Market Department
Reserve Bank of India	A B Chakraborty Monetary Policy Department
	Malvika Sinha Department of Banking Operations and Development
Bank Indonesia	Made Sukada Economic Research and Monetary Policy Directorate
	Wimboh Santoso Financial Stability Bureau
Bank of Japan	Shinobu Nakagawa International Department
Bank of Korea	Yangwoo Kim Institute for Monetary and Economic Research
	Taesoo Kang Financial Markets Department
	Kyuil Chung Institute for Monetary and Economic Research
Central Bank of Malaysia	Norhana Endut Monetary Assessment and Strategy Department
Bangko Sentral ng Pilipinas	Winecito Tan Department of Economic Statistics
Sveriges Riksbank	Mattias Persson Financial Stability Department
Bank of Thailand	Tientip Subhanij Economic Research Department
Federal Reserve Bank of Boston	Eric Rosengren President
Federal Reserve Bank of New York	Richard Peach Research Department

Bank for International Settlements Robert McCauley
Eli Remolona
Andrew Filardo
Guonan Ma
Ilhyock Shim

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Introduction

Guonan Ma, Eli Remolona and Ilhyock Shim[1]

This volume is a collection of the speeches and papers delivered at the seminar "Household debt: implications for monetary policy and financial stability". The seminar was co-organised by the Bank of Korea (BoK) and Bank for International Settlements (BIS) under the BIS Asian Research Programme. It was held on 28 March 2008, in Seoul, Korea. Represented at the seminar were eleven central banks from Asia and the Pacific, Sweden and the United States. Governor Seongtae Lee of the BoK and Robert McCauley, BIS Chief Representative for Asia and the Pacific delivered opening speeches. President Eric Rosengren of the Federal Reserve Bank of Boston gave the keynote speech. Eli Remolona, BIS Head of Economics for Asia and the Pacific, wrapped up the seminar.

The theme of the seminar, chosen based on consultations between the BIS, the BoK and other central banks, turned out to be very timely, with the seminar being held even as the global financial turmoil continued to unfold. The seminar was divided along four topics: (1) mortgage finance; (2) consumer credit; (3) securitisation; and (4) policy challenges. Each session was introduced by three or four lead presentations to stimulate discussion on the floor. This introduction highlights some of the recent trends in the region's household debt and the associated policy challenges as presented at the seminar.

Trends in household debt

Over the past decade, the region's household debt grew significantly, but the speed of growth varied across markets. The level of household debt in many countries doubled and in some cases increased by nearly 50 times, albeit from a low base. The fast growth in lending to households has markedly increased the share of household loans in total bank loans: as of 2007, it ranged from 15% in China to 70% in Australia. In 2007 the level of household debt as a proportion of GDP ranged from a low of 7% in Indonesia to a high of 82% in Korea; in contrast, the share was more than 100% in both the United States and the United Kingdom.

In particular, many of the papers at the seminar reported household balance sheet information for several countries (Australia, Indonesia, Japan, Malaysia and Thailand). Such debtor information can complement creditor data for policy analysis and in monitoring the financial position of households.

Seminar participants identified several factors that contributed significantly to the strong expansion of household debt over the past decade. On the demand side, high economic growth, low and stable inflation, falling interest rates and demographic changes including urbanisation spurred household borrowing. On the supply side, financial deregulation, financial innovations, technological advancements and weak corporate demand for loans contributed to the increased availability of household lending. In some cases, other factors, such as government policies to promote lending to households via tax incentives and government-sponsored institutions, have been instrumental in the development of household

[1] Eli Remolona is Chief Representative of the BIS Representative Office for Asia and the Pacific, where Guonan Ma and Ilhyock Shim are Senior Economists. Robert McCauley was Chief Representative of the BIS Asian Office at the time of the seminar, and is now a Senior Adviser in the Monetary and Economic Department.

finance. Asset prices, particularly housing prices, have often in turn further stimulated increases of household lending, although the latest global financial turmoil and resulting economic weakness have to some extent damped the rise.

The structure and composition of household debt exhibit similarities as well as diversity across markets in Asia and the Pacific. Mortgages have been by far the largest component of household debt for most of the markets, ranging in share from 50% to more than 80%. Mortgage debt has been dominant in part because collateralised lending tends to ameliorate the problems of adverse selection and moral hazard, and in part because many governments have promoted housing ownership. The only exception for the economies covered by this volume is the Philippines where the proportion of mortgage in total household debt is only about one third. Nevertheless, the fragmented provision of housing finance in the Philippines may lead to an understatement in the data on the overall mortgage burden there.

The remainder of the household debt category is consumer debt, which in the region consists mainly of loans for motor vehicles, credit card debt and education and personal loans. In Indonesia and the Philippines, motor vehicle loans have constituted a greater share of consumer debt and been of higher quality than elsewhere in Asia and the Pacific; in China, such loans were much more volatile in some recent years than elsewhere in the region. Regarding credit card lending, Korea recently experienced a boom-bust cycle in that market.

Rapid growth in household borrowing offers both opportunities and challenges. Household debt offers several advantages: better access by households to credit facilities for consumption smoothing, a new source of income for Asian financial institutions, and portfolio diversification for the banking sector. In the longer term, a healthy and vibrant household finance sector also facilitates a shift towards domestic demand that will help rebalance the export-oriented growth model of many Asian economies. However, high levels of household debt may heighten an economy's vulnerability to instability and crises. Such problems have been seen in the boom-bust cycles in some credit card markets, rapid house price increases in several economies and the ongoing global financial turmoil.

The securitisation of household debt has been a relatively new development in most markets in Asia and the Pacific. One notable exception is Australia, where a market in residential mortgage-backed securities has thrived for a number of years. In several Asian countries, government agencies have played an important role in the securitisation of residential mortgages and other consumer debt. However, the latest global financial turmoil has halted the region's growth in the securitisation of household debt. Indeed regional policymakers have been keen to draw lessons from the US experience to ensure that their own mortgage securitisation markets develop in a sound way.

Policy implications

The implications of rising household debt for monetary policy are explored in several papers. For instance, Norhana Endut and Toh Geok Hua, of the Central Bank of Malaysia, and Wimboh Santoso and Made Sukada, of Bank Indonesia, propose that a higher level of household debt increases the potency of monetary policy because it heightens the sensitivity of households to changes in interest rates. Hence, a case can be made for more-gradual changes in monetary policy. On the other hand, Kyuil Chung, of the BoK, argues that excess household indebtedness may constrain the effectiveness of monetary policy because fewer households are able to borrow for consumption smoothing. To alleviate output volatility in this case, monetary policy should respond more to inflation.

Although mortgages dominate household borrowing, evidence varies on how monetary policy affects house prices and thus on the external finance premium and wealth effect. Also, the mortgage market structure helps shape the effects of monetary policy. The dominance of variable-rate mortgages facilitates fast flow-through of a change in policy rates; but in today's

global financial turmoil, the higher dependence on capital market funding entailed by such dominance increases the influence of non-monetary policy factors (see the paper by Michael Davis, of the Reserve Bank of Australia).

Most of the papers in this volume discuss the implications of higher household indebtedness for financial stability in terms of the need for monitoring the household sector's financial position and of the ability of market infrastructure and prudential regulation to provide a resilient financial system. Many authors point to the need for both aggregate and micro data on household borrowing and balance sheets if monitoring is to discover the build-up of stresses before they become excessive. As of this writing, data from most of the Asian markets show the financial condition of the household sector to be healthy, and loans to households remain among the best assets of financial institutions (for example, see the paper by Shinobu Nakagawa and Yosuke Yasui of the Bank of Japan). Most banks in Asia also appear well capitalised and less exposed to external funding stress. The infrastructure for sharing consumer credit information, centralised or otherwise, is being improved but has proven to be no panacea. Prudential regulations – such as strong write-off rules, minimum loan-to-value ratios for mortgages and minimum income requirements for credit cards – should be put in place and vigorously enforced to act as speed bumps in boom times (see the paper by Taesoo Kang of the BoK and Guonan Ma of the BIS).

Finally, a highly challenging question for regional policymakers lies in the complex interaction between monetary and financial stability. In particular, price stability may not always suffice to ensure macroeconomic stability, as highlighted by Andrew Filardo of the BIS. Much more still needs to be learned about the trade-offs facing central banks, the need to expand central bank mandates (as well as the possible scope for doing so) and the role of tail risks in setting monetary policy.

Opening address

Seongtae Lee[1]

I bid a sincere welcome to central bankers participating in this seminar held jointly by the Bank for International Settlements (BIS) and the Bank of Korea. Let me also express my deep gratitude to our keynote speaker, Dr Eric Rosengren, President of the Federal Reserve Bank of Boston.

This seminar has been organised under the BIS's Asian Research Programme to allow central banks to share their experience and opinions with regard to major monetary policy issues. The theme, "Household Debt: Implications for Monetary Policy and Financial Stability", is very closely related to the current international financial market turmoil generated by the US subprime mortgage meltdown and should therefore be of great interest to us all.

Growth of household debt: background

As you are all well aware, household debt in many countries has increased quite sharply since the early 2000s. In the United States, the ratio of household debt to GDP rose from 75% in 2000 to 104% in 2007, led largely by an expansion in mortgage lending. According to an analysis by the IMF, household debt in 12 Asian countries, including Korea, Japan and China, grew by 15% per year, on average, between 2002 and 2006. Mortgage debt accounted for about two thirds of this growth.

There are a number of reasons for this rapid build-up of household debt. First, it is due, to a certain extent, to demographic changes. The ageing of the baby boom generation, together with urbanisation, has fuelled a steady increase in housing demand. Second – and to my mind an even greater factor in the increase in household debt – has been the persistence of low inflation and low interest rates. Over the last few years, heightened productivity stemming from the IT revolution and the progress of globalisation has kept prices relatively stable. Accordingly, central banks in every country maintained policy rates at low levels. This resulted in low lending rates, which further boosted demand for household loans. Third, as anticipations of real estate price increases formed owing to abundant global liquidity, mortgage lending for the purpose of speculative housing purchases expanded sharply. Fourth, in the United States and other advanced countries, mortgage securitisation and the transfer of credit risk, made easier by the development of advanced financial techniques, were also a factor in rising household debt.

Assessment of the increase in household debt

This great increase in household debt did have positive effects on household welfare and financial institutions, as well as on the macroeconomy overall. Expanded borrowing opportunities helped to improve the quality of life of many households by making consumption-smoothing over the life cycle and house purchases easier.

[1] Governor of the Bank of Korea.

Household lending and transactions in credit derivatives whose underlying assets were household loans broadened the range of profit opportunities available to financial institutions. The total outstanding volume of credit derivatives worldwide is estimated to have expanded by a factor of 110, from US$ 180 billion in 1997 to US$ 20 trillion in 2006. In Korea, the share of household lending in banks' total loans rose from 28% in 1996 to 50% in 2006. With corporate demand for funds drastically reduced after the 1997 financial crisis, Korean banks turned to household lending to increase their profit bases.

Increased household lending helped to heighten housing market vitality, stimulate consumption and enhance banks' profitability. In these respects, it is considered to have contributed to the improvement of the macroeconomy in terms of business activity and employment trends.

Having said this, however, I should point out that if household debt rises to an excessive level, there is a greater likelihood of households' being unable to repay the principal and interest on their loans when interest rates rise or housing prices fall. This, of course, may result in financial institution insolvency and generate financial market turmoil, which in turn have a negative impact on the real economy, as has been dramatically demonstrated by the US subprime mortgage meltdown. When lenders extended the subprime mortgages now in difficulty, they often neglected to screen borrowers thoroughly to verify their ability to repay. Credit risk then spread through the financial system by way of mortgage-backed securities and collateralised debt obligations. For these reasons, the weakening of economic conditions aggravated the problems posed by non-performing mortgages, with a correspondingly severe impact on financial markets.

In Korea, however, there have been no signs as yet of household debt turning sour, although it has increased very rapidly since the early 2000s. The delinquency rates on banks' household loans stood at only 0.6% at year-end 2007.

Future policy tasks

In many countries, housing loans account for a large proportion of household debt. To maintain household debt soundness, therefore, the absolutely crucial thing is to avoid a housing boom and bust cycle. This requires micro policy initiatives targeting the supply of and demand for housing and the tax regime. Even more important, however, are macroeconomic policies that keep the overall economy on a stable course.

What is more, given that financial innovation can amplify financial unrest, central banks and financial supervisory authorities should redouble their efforts to construct effective systems for the monitoring and supervision of financial derivatives.

Closing remarks

I expect this seminar will be a forum for policy debate, involving in-depth and constructive discussions about household debt issues.

In closing I should once more like to voice my deep thanks to all of you for taking part. I hope you will be able to spare some time to gain a taste for Korean culture and the beauty of spring here. Thank you.

Bank supervision and central banking: understanding credit during a time of financial turmoil

Eric S Rosengren[1]

Introduction

I would like to thank the Bank of Korea and the Bank for International Settlements for sponsoring this seminar, "Household Debt: Implications for Monetary Policy and Financial Stability", and for inviting me to participate as the keynote speaker. The planned sessions on mortgage finance, consumer credit and securitisation are all particularly topical and touch on areas that have been of keen interest, especially since July 2007, to the Federal Reserve and central banks throughout the world.

Today I am going to focus my remarks on the information central banks need to make informed decisions during periods of financial turmoil. In particular, I am going to highlight the fact that non-public information about financial institutions has been extremely useful in understanding the current problems in US financial markets and how those problems might factor into monetary policy decisions and other policy matters.

At today's seminar we have representatives from a diverse set of countries, and in those countries the responsibilities of the central bank in bank supervision vary considerably. The Federal Reserve has supervisory responsibilities over bank holding companies as well as over banks that choose both to have a state charter and to be members of the Federal Reserve. These supervisory responsibilities, I would argue, have been instrumental in dealing with the current episode of financial turbulence.

In many countries, the role of bank supervisors continues to evolve, but whatever the institutional arrangements that prevail in your countries, I would argue that hands-on supervisory experience can be critically important to the central bank during times of stress and can significantly improve the ability of the central bank to choose appropriate monetary policy and address problems related to financial stability.

To make that argument, today I am going to discuss four areas where knowledge of confidential, non-public information about financial institutions has been important to central bankers. This is a topic that I investigated a number of years ago with co-authors Joe Peek and Geoff Tootell. Our research found that the confidential information available to bank supervisors could be used to improve central bank forecasts of inflation, unemployment and gross domestic product.[2]

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[1] President and Chief Executive Officer, Federal Reserve Bank of Boston. The views I express today are my own, and are not necessarily those of my colleagues on the Board of Governors or the Federal Open Market Committee (FOMC).

[2] See J Peek, E S Rosengren and G M B Tootell, "Is Bank Supervision Central to Central Banking?" *The Quarterly Journal of Economics*, vol 114, no 2, May 1999, pp 629–53. The paper finds that confidential bank supervisory information could help more accurately forecast important macroeconomic variables and is useful to monetary policymaking. The findings suggest that the complementarity between supervisory responsibilities and monetary policy should be an important consideration when evaluating the structure of a central bank.

See also J Peek, E S Rosengren and G M B Tootell, "Does the Federal Reserve possess an exploitable informational advantage?" *Journal of Monetary Economics,* vol 50, no 4, May 2003, pp 817–39, which found evidence that the Federal Reserve has an informational advantage that can be used to improve monetary policy.

Given the events that have occurred since financial turmoil emerged in July 2007, I am now even more confident that central banks need to have the experience and perspective gained through bank supervision, although the institutional arrangements that can facilitate the acquisition of useful insights from this activity are likely to vary by country. For me, the information gleaned from the Federal Reserve's role as a hands-on bank supervisor has been particularly useful in thinking about appropriate monetary policy in the following four ways.

First, understanding the size of and basis for likely losses has been useful in highlighting potential financial stability issues, as well as in determining where credit availability may become a problem. To be sure, the degree of exposure to loss that is embedded in complex financial instruments has been very difficult to ascertain – for banks' own managers, let alone bank supervisors – as many of the recent losses have involved complex and opaque financial instruments tied to the mortgage market. But that challenge notwithstanding, we know that the way banks are likely to behave is linked to the size of their current and expected future losses, which we, as supervisors with access to internal bank documents and interactions with bank management, can estimate.

Second, banks' balance sheet constraints can transmit financial shocks to the real economy. Banks with capital constraints may be unable to provide loans or extend credit in markets where they are a key source of liquidity. For central bankers to gauge potential balance sheet constraints, now and in the future, requires a detailed understanding of a bank's financial position, capital management strategies and likely management actions.

Third, as problems spill over from mortgage loans to other types of credit, banks' actions can have a significant impact on macroeconomic growth. For example, reducing lines of credit on home equity loans and credit cards could have a significant impact on consumers and dampen economic growth.

Fourth, many of the recent proactive steps taken by the Federal Reserve relative to discount window lending are facilitated and informed by its role as a bank supervisor. These steps, taken by the central bank in its role as a lender of last resort, make it a counterparty to banks, which requires an understanding of banks' liquidity risk and solvency.

Overview: banks and financial turmoil

One can find numerous examples of the critical role played by banks in periods of financial turmoil. In the United States in the early 1990s, losses on commercial real estate and construction loans caused capital-constrained banks to contract their balance sheets. The result was that even companies with good business prospects found it difficult to secure adequate financing despite efforts to lower interest rates through monetary policy, causing the often-cited "headwinds in monetary policy".

A sizeable body of literature indicates that problems in Japan's banking sector played a significant role in that country's so-called "lost decade".[3] Also, in the mid-1990s, many Asian

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In J Peek, E S Rosengren and G M B Tootell, "Identifying the macroeconomic effect of loan supply shocks", *Journal of Money Credit and Banking*, vol 35, no 6, part 1, December 2003, pp 931–46, the authors found that confidential supervisory information was useful in predicting components of GDP that would likely be dependent on bank financing.

[3] See, for example, J Peek and E S Rosengren, "Unnatural selection: perverse incentives and the misallocation of credit in Japan", *American Economic Review*, vol 95, no 4, September 2005, pp 1144–66; and R J Caballero, T Hoshi and A K Kashyap, "Zombie lending and depressed restructuring in Japan", *NBER Working Paper,* no 12129, 2006.

countries found that their banking sectors exacerbated problems that had originated in real estate and foreign exchange markets. We see similar episodes in Europe as well.

Why do banks play such critical roles during periods of financial turmoil?

First, their balance sheet structure tends to amplify the effect of economic shocks. Banks are highly leveraged and highly regulated. In order to maintain their capital ratios after experiencing a large capital shock, banks must significantly shrink assets on their balance sheets – in other words, not make or acquire loans – since their ability to raise capital at such times can be quite limited.

Second, while their role in financing business and residential investment has diminished in recent decades, banks remain the primary source of liquidity during periods of financial turmoil. Banks extend lines of credit, and these lines are most likely to be utilised when firms are experiencing financial difficulties. However, banks provide liquidity not only to firms but also to finance an array of complex financial instruments. For example, in the United States, banks have been providing liquidity to the commercial paper markets, off-balance sheet financial vehicles (such as conduits, special investment vehicles – SIVs – and the like) and municipal financing programs (for example, through auction rate securities).

Third, banks are often the main source of financing to smaller firms and are key market-makers in a variety of financial markets – for example, as dealers for municipal auction rate securities. Should they choose to shrink their balance sheets, bank-dependent borrowing and markets where banks are key players could be disrupted.

In sum, understanding banks is critical to understanding how financial shocks can be transmitted to the real economy. Unfortunately, understanding how banks are likely to respond to problems requires far more than published financial statements. While US banks report detailed information on their balance sheets and income statements, these reports do not provide sufficient information to allow central banks to discern how banks are responding to problems.

Estimating losses

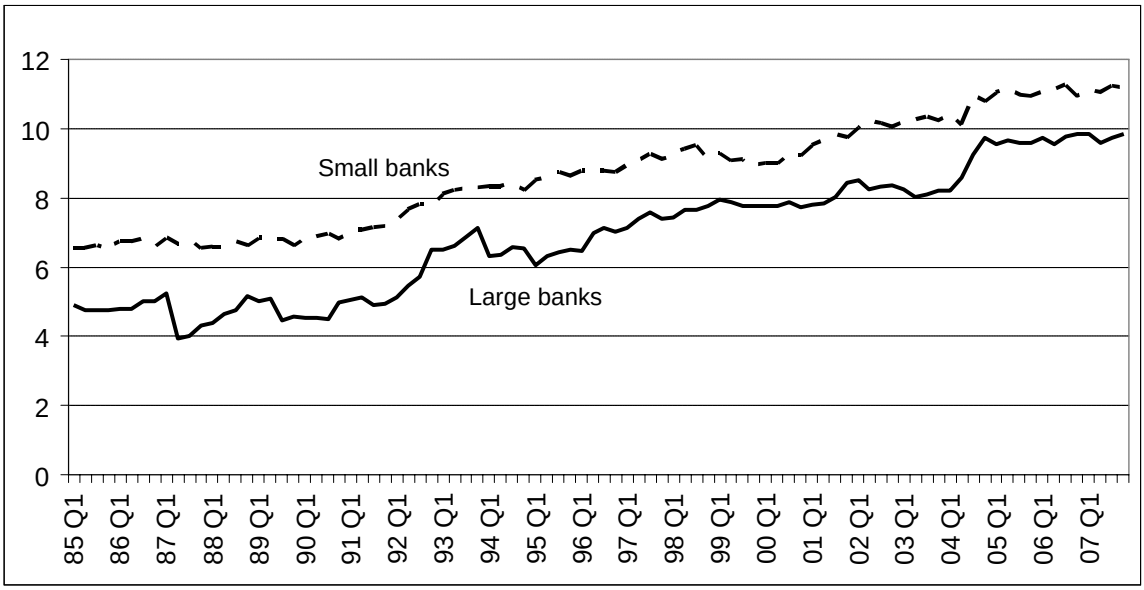
The current financial turbulence, like most such episodes, has unexpected sources. In 2006, I met with risk managers from a number of global banks. At that time the risk managers highlighted that they saw little risk emerging from the mortgage market. While they acknowledged the rapid acceleration in residential real estate prices, they emphasised that banks were extremely well capitalised and that internal stress tests indicated that net income would be lower but still positive should real estate prices decline by 10% or even 20% – in other words, there would be a loss of earnings but not of capital. Obviously, events have been more severe than that, and some of the largest financial institutions have found themselves needing to aggressively seek capital infusions.

It is worth highlighting that the banks' observations about being well capitalised were accurate. The attention that regulators have given to capital has caused banks in the United States to be much better capitalised going into these difficulties than they were in the 1990s (see Graph 1).

Graph 1

Ratio of equity capital to assets at US commercial and savings banks, by asset size

In per cent



Large banks are banks with assets of $50 billion or more.

Source: Commercial and savings bank Call Reports.

The introduction of the Basel I and Basel II capital accord frameworks and of modern risk management techniques that focus on value-at-risk modelling has caused banks to increase their capital. Current problems would clearly be worse had this not occurred. Similarly, bank supervisors viewed banks as being in good financial health, as indicated by the very low number of banks considered problem institutions by the Federal Deposit Insurance Corporation (FDIC)[4] (see Graph 2) – although there has been some additional deterioration recently.

Even with the highly publicised financial turmoil that began in July, most banks remained profitable in 2007 (see Graph 3). While a few banks have announced very significant losses to date, these have been large banks actively engaged in residential mortgage securitisation. Both the number and the share of banks reporting losses in 2007 were well below those of the early 1990s.

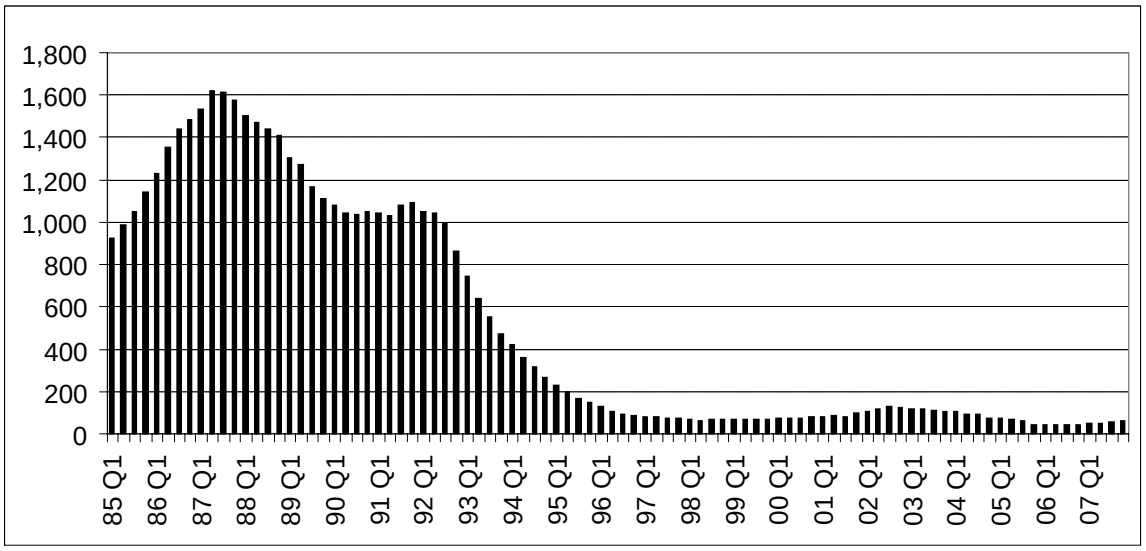
So how is it that the stress tests carried out by large global banks did not indicate these banks' susceptibility to falling housing prices in the United States? Most of these stress tests assumed that lower housing prices would cause elevated losses on construction loans and

[4] In defining problem institutions in FDIC, *Quarterly Banking Profile,* fourth quarter 2007, the FDIC notes, "Federal regulators assign a composite rating to each financial institution, based upon an evaluation of financial and operational criteria. The rating is based on a scale of 1 to 5 in ascending order of supervisory concern. 'Problem' institutions are those institutions with financial, operational, or managerial weaknesses that threaten their continued financial viability. Depending upon the degree of risk and supervisory concern, they are rated either a '4' or '5'. For all insured commercial banks and for insured savings banks for which the FDIC is the primary federal regulator, FDIC composite ratings are used. For all institutions whose primary federal regulator is the OTS, the OTS composite rating is used." (OTS is the Office of Thrift Supervision.)

holdings of subprime[5] loans, but most of the large global banks did not have significant exposure in those areas.

Graph 2

Number of problem US commercial and savings banks



Source: FDIC, *Quarterly Banking Profile.*

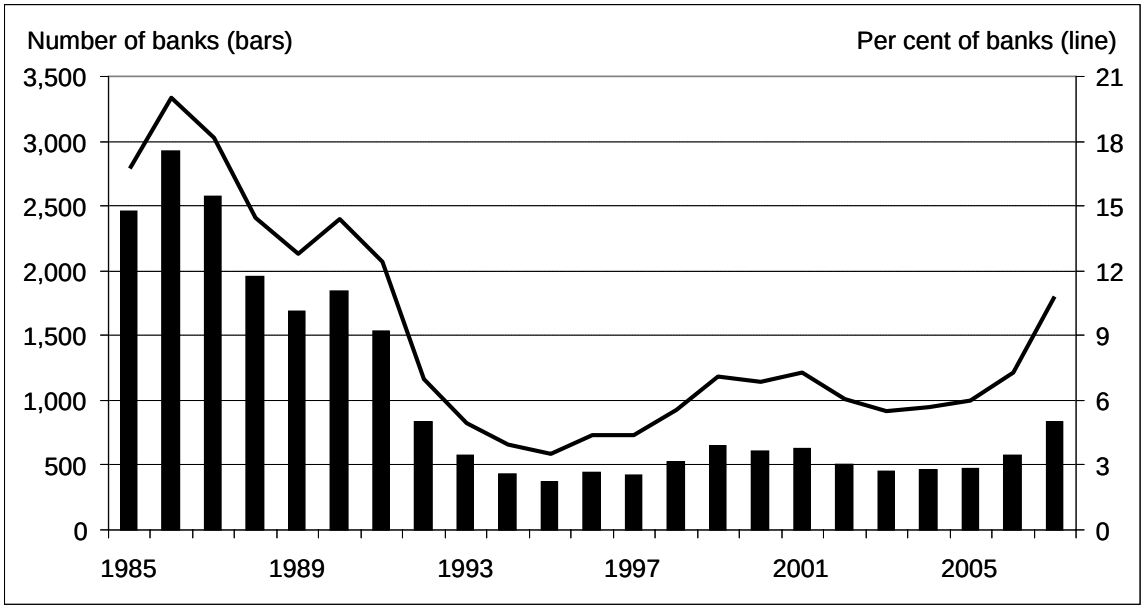
What these stress tests crucially failed to capture was the effect of house price declines on the large holdings of highly rated securities held by global banks – the products of mortgage securitisation activities, with their payment streams ultimately tied to the performance of subprime loans. In particular, they thought that housing prices nationwide were unlikely to fall but that, even if they did, only the high-risk slices or "tranches" of these securitised pools of mortgages would be affected – and the high-risk tranches were generally not held by

[5] In essence, subprime loans are mortgage loans that have a higher risk of default than prime loans, often because of the borrowers' credit history, and therefore carry higher interest rates. Certain lenders, typically mortgage banks, may specialise in subprime loans. Banks, especially smaller community banks, generally do not make subprime loans, although a few large banking organisations are active through mortgage banking subsidiaries. According to interagency guidance issued in 2001, "The term 'subprime' refers to the credit characteristics of individual borrowers. Subprime borrowers typically have weakened credit histories that include payment delinquencies and possibly more severe problems such as charge-offs, judgments, and bankruptcies. They may also display reduced repayment capacity as measured by credit scores, debt-to-income ratios, or other criteria that may encompass borrowers with incomplete credit histories. Subprime loans are loans to borrowers displaying one or more of these characteristics at the time of origination or purchase. Such loans have a higher risk of default than loans to prime borrowers. Generally, subprime borrowers will display a range of credit risk characteristics that may include one or more of the following: Two or more 30-day delinquencies in the last 12 months, or one or more 60-day delinquencies in the last 24 months; Judgment, foreclosure, repossession, or charge-off in the prior 24 months; Bankruptcy in the last 5 years; Relatively high default probability as evidenced by, for example, a credit bureau risk score (FICO) of 660 or below (depending on the product/collateral), or other bureau or proprietary scores with an equivalent default probability likelihood; and/or Debt service-to-income ratio of 50 percent or greater, or otherwise limited ability to cover family living expenses after deducting total monthly debt-service requirements from monthly income. This list is illustrative rather than exhaustive and is not meant to define specific parameters for all subprime borrowers. Additionally, this definition may not match all market or institution-specific subprime definitions, but should be viewed as a starting point from which the Agencies will expand examination efforts."

US banks. In fact, triple-A rated tranches continued to trade close to par when problems in subprime loans first became apparent in 2007 (see Graph 4[6]).

Graph 3

Number and share of US commercial and savings banks reporting annual losses



Source: Commercial and savings bank Call Reports.

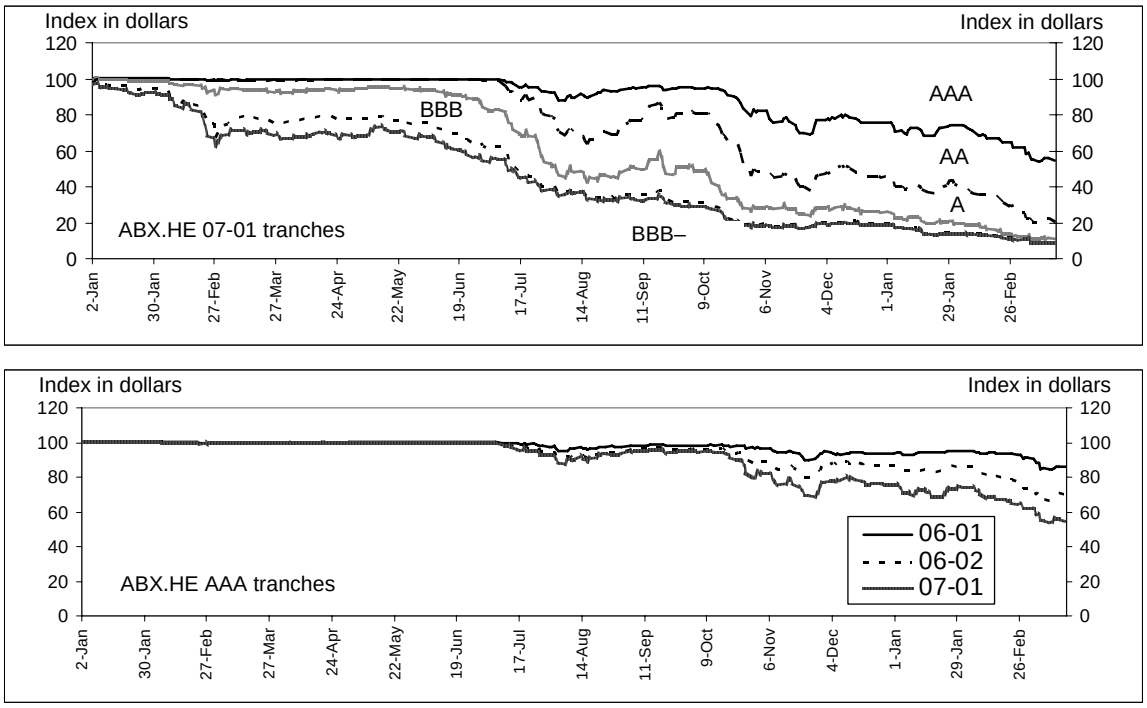
However, since the financial turmoil starting in July, the triple-A rated securities with payment streams derived from subprime loans have been trading as low as 60 percent of par. Such values likely reflect a significant risk premium for holding mortgage-backed assets. The size of that risk premium is somewhat surprising, since the defaults on the underlying subprime assets would need to be quite severe to result in such large losses for these highest-rated and most secure tranches – and investors would take losses on these high-grade securities only after all lower-graded securities had been wiped out.

Valuation has been made difficult by several factors – including uncertainty over both the number of borrowers that may eventually default on their subprime mortgage loans and the liquidation value of foreclosed properties in the depressed residential real estate market, and the large discounts that market participants have placed on complex financial assets tied to subprime loans. In addition, the deep discounts on highly rated securities have made investors sceptical of ratings as an indicator of default probabilities. With few trades taking place – and a large number of those trades qualifying as "distress sales" – the actual worth of many of instruments is difficult to determine with confidence.

[6] According to D Greenlaw, J Hatzius, A K Kashyap and H S Shin, "Leveraged losses: lessons from the mortgage meltdown", a paper presented at the 2008 US Monetary Policy Forum on 29 February 2008, "The ABX index represents a basket of credit default swaps linked to subprime mortgages. The indices are constructed by pooling mortgages with similar (internal) credit ratings."

Graph 4

Markit ABX.HE indices



Markit news releases define the Markit ABX.HE as "a synthetic index of US home equity asset-backed securities …. The index is a family of five sub-indices, each of which consists of a basket of 20 credit default swaps referencing US subprime home equity securities issued over the previous six months …." The ABX.HE-06-01 index was launched on 19 January 2006.

Source: Markit.

However, knowing both the nature of a bank's exposure to these assets and the possible pricing outcomes is critical to estimating the bank's potential losses and its management's likely responses to them, given an environment of falling housing prices and the prevalence of underwriting problems with many subprime loans originated after 2004. Bank supervisors have the ability to get detailed information on banks' exposures and the current and possible future pricing of the assets.

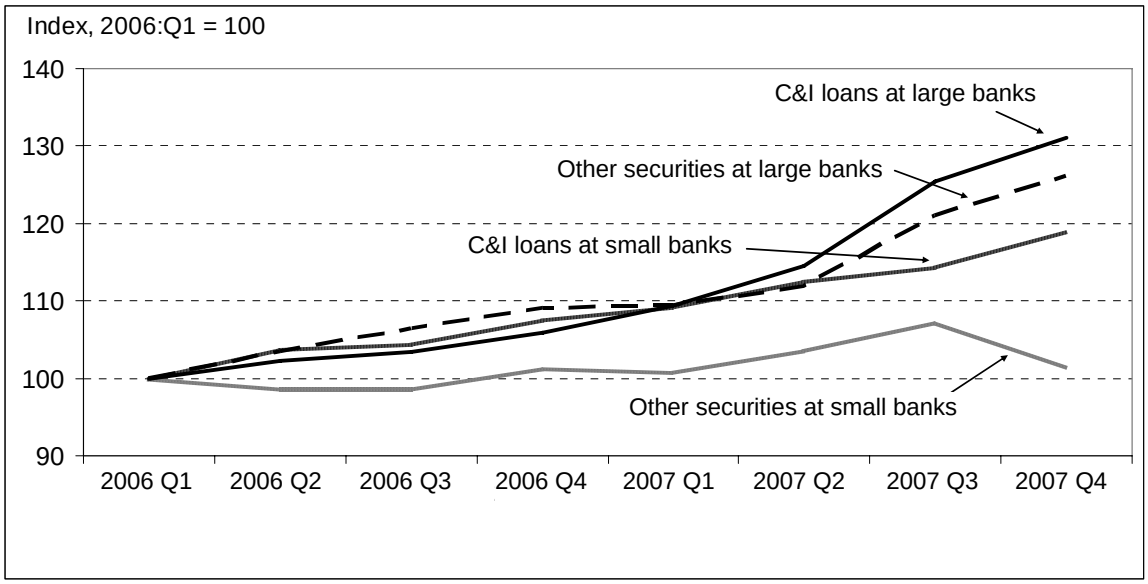
The importance of balance sheet constraints

How banks manage their lending in the face of balance sheet constraints can have significant macroeconomic effects. If banks are unwilling to lend in the subprime and jumbo markets because loans in these markets are now difficult to securitise, the recovery of residential real estate may be impeded. If banks cut back on loans to businesses, business fixed investment and investment in commercial property may be impeded. If banks choose to reduce lines of credit to consumers, consumption may be impeded. These examples simply underline the fact that during a period of financial turmoil it is important for central bankers to understand the degree of balance sheet constraint and how banks' management may choose to respond.

As Graph 5 illustrates, during the recent financial turmoil bank assets in the United States have actually grown, particularly at the largest institutions. Banks have reduced their holdings of government securities but have expanded their holdings of other securities and commercial and industrial loans.

Graph 5

Balance sheet growth at US commercial and savings banks, by asset size



Large banks are banks with assets of $50 billion or more. Other securities include all securities except government securities.

Source: Commercial and savings bank Call Reports.

Much of this growth is probably due to "involuntary lending" – that is, banks expanding assets because of previous liquidity commitments made when conditions were more favourable. Factors contributing to the increase in balance sheet assets include the inability to roll over commercial paper[7] and to sell either leveraged loans originated in the expectation that they would be quickly distributed or assets in the process of being securitised, liquidity triggers forcing the purchase of municipal bonds and expanded use of lines of credit. Such factors can significantly swell bank assets, placing pressure on capital-constrained banks to pull back in other areas. And banks' choices regarding which types of credit to shrink can have macroeconomic consequences.

Predicting how a bank is likely to respond requires detailed knowledge of its assets, both on-balance sheet and off-balance sheet, and information about which business lines each institution views as critical in the event it is forced to shrink its activity (in other words, to cut back on credit extension) in some areas.

Indeed, calculating how constrained banks are likely to become is not straightforward, requiring, among other things, an understanding of the size of any possible losses that reduce banks' capital. At the same time, the likely growth in bank assets can also be very

[7] For example, as problems with mortgage-related loans emerged, some investors became reluctant to continue lending in the asset-backed commercial paper (ABCP) market. This reduction in the availability of short-term funds caused the rates on ABCP to rise and also forced some financial institutions to buy back ABCP that they could no longer refinance, putting it on their balance sheets. The combination of uncertainty over the appropriate rating of mortgage-related securities and the expansion of bank balance sheets put significant pressure on the availability of short-term credit. In addition, banks, as liquidity providers, were expanding their balance sheets in other areas, and much of this expansion was not anticipated prior to the financial turmoil. Some banks have had to take writedowns on various assets, and the losses, in combination with involuntary growth in assets, have made some banks reluctant to expand their balance sheets further.

important – and it is virtually impossible to estimate without the kinds of ongoing discussions bank supervisors have with bank management.

Potential for spillover to retail consumption

While the problems at many large banks originated with subprime mortgages and securitisation, policymakers and others are rightly paying attention to potential spillovers. As banks have seen housing prices decline, they have been reducing lines of credit associated with credit cards and home equity loans. The decline in home prices, which is a key driver of subprime defaults,[8] also erodes the value of the collateral in home equity lines. Thus, geographic areas that are experiencing falling home prices are likely to see a decline in the credit available for home equity lines, even if credit scores have not changed.

Similarly, banks are noticing – perhaps not surprisingly – that non-performing credit card loans have increased more in areas with elevated home foreclosures.[9] As a result, some banks are re-examining their risk exposure with regard to lines of credit in areas with falling home prices and significant mortgage problems.

Consumers whose credit lines are reduced or limited to loans outstanding lose an important financing option. To the extent that untapped lines of credit serve as a precautionary source of funds, consumers may be less willing to make purchases, and purchases by consumers who find themselves limited to current cash flow are likely to decrease.

Let me emphasise that it is too early to determine the degree to which consumers will be restrained by a lack of credit in the current situation. But the central bank will be able to detect such trends more easily, earlier and with greater accuracy if it has supervisory engagement with financial institutions.

Bank supervision and the lender of last resort

I would argue that it is very difficult for a central bank to be an effective lender of last resort without significant knowledge of the current and prospective value of assets and liabilities held by financial institutions. Like any counterparty, a central bank acting as a lender needs to be able to evaluate the solvency and liquidity of a borrowing institution.

Of course, determining the future solvency of an institution can be challenging, particularly when assets are difficult to value. Knowing how likely it is that an institution's sources of funds will evaporate during times of financial stress requires significant understanding of the institution's liabilities and its counterparty relationships. Such information has been particularly important of late, as the Federal Reserve has initiated a variety of innovative techniques to provide liquidity to the marketplace.

Table 1 provides a list of the various initiatives taken recently by the Federal Reserve related to its discount window in an effort to enhance market liquidity and prevent difficulties from

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[8] See K Gerardi, A H Shapiro and P S Willen, "Subprime outcomes: risky mortgages, homeownership experiences and foreclosures", *Federal Reserve Bank of Boston Working Papers,* no W07-15, updated May 2008, at www.bos.frb.org/economic/wp/wp2007/wp0715.htm .

[9] In his testimony to the US Senate Committee on Banking, Housing and Urban Affairs on 4 March 2008, Federal Reserve Board Vice Chairman Donald Kohn noted that delinquency rates on credit cards and consumer instalment loans had increased over the second half of 2007. He added that the Fed was monitoring these segments of the consumer loan market for signs of spillover from residential mortgage problems and that it was paying particular attention to the securitisation market for credit card loans.

spreading to more institutions and, ultimately, to the real economy and individuals. Because of the complexity of, and institutional details involved in, each of these initiatives, today I will focus on just one, the Term Auction Facility.

Table 1

Recent Federal Reserve initiatives

•	Term Auction Facility (TAF) – each auction (two per month) provides $50 billion in discount window loans.
•	Expanded collateral for Fed 28-day repurchase agreements – helps dealers finance mortgage-backed securities (MBS) – up to $100 billion.
•	Term Securities Lending Facility (TSLF) – lends up to $200 billion in Treasury securities in return for agency and MBS.
•	Primary Dealer Lending Facility (PDLF) – discount window loans available for primary dealers at the primary credit rate.

For a complete listing of the forms of Federal Reserve lending to financial institutions, see the Federal Reserve Bank of New York's website, www.newyorkfed.org/markets/Forms_of_Fed_Lending.pdf.

The Term Auction Facility allows banks to obtain short-term financing using, as collateral, a subset of assets that the marketplace currently sees as illiquid. It also provides an opportunity for banks to get financing for approximately one month during a period when obtaining such financing has sometimes proved difficult. Every other week, the Federal Reserve holds an auction where banks are able to use collateral to get a loan at the discount window. Currently, $50 billion in loans is available at each auction. The auctions have been well received and have generally resulted in financing rates (determined by the auction) that are somewhat higher than the federal funds rate.

To qualify, a bank needs, first of all, to be in sound financial condition, as the Federal Reserve must have confidence that the bank will be solvent for the term of the loan. While determining the bank's financial condition is left to the individual Federal Reserve Bank in whose district the institution resides, the Fed generally requires that the bank not have low supervisory ratings. Second, the institution needs to have collateral at the Federal Reserve. Our discount officers determine, as best they can, the market value of the collateral and apply an appropriate "haircut".

There is little question in my mind that both the determination of the potential solvency risk and the evaluation of the institution's collateral are greatly aided by having experienced bank supervisors at the central bank.

Conclusion

Two years ago, few analysts anticipated significant retail credit and banking problems. At that time, the most recent banking problems in the United States had been driven by problems in *commercial* real estate loans. The current turmoil stems from troubles with *residential* real estate loans that are, for the most part, owned indirectly, through securitisation.

The uncertainty surrounding the ratings applied to relatively new and opaque financial products and the difficulty in pricing complex financial assets have seriously disrupted the "originate-to-distribute" model of recent real estate finance. In particular, it is clear that instruments that involve financing long-term assets with short-term liabilities, without the backing of institutional liquidity, are not especially suited to withstand times of financial distress such as the one we are facing.

Today I have argued that knowledge of financial institutions has been a critical component of my own thinking as a central banker. In my view, a central bank incurring potential counterparty risk as a lender of last resort needs to have sufficient information to assess the solvency of its counterparty and the liquidity of the latter's collateral – the same information required by private counterparties.

Much of our understanding of the economy's evolution since July 2007 has been greatly influenced by the turmoil affecting financial markets. The economy's path will vary depending on the size and nature of the problems at financial institutions, the distribution of those problems and the reaction of bank management to them. I believe strongly that at the Federal Reserve, our role as bank supervisors within a central bank has greatly facilitated our ability to operate effectively during this challenging period.

Opening speech

Robert McCauley[1]

Governor Lee, President Rosengren, ladies and gentlemen:

First of all, I would like to welcome all the participants, some of whom have travelled far from home to attend this seminar. Second, I wish to commend the superb efforts of the staff of the Bank of Korea who, along with my colleagues from the Bank for International Settlements, have organised this seminar.

Indeed, this joint seminar is an expression of active and close cooperation between the Bank of Korea and the BIS. It will showcase the fruits of our collaboration in policy research – namely, the work of Tae Soo Kang and Guonan Ma on episodes of credit card lending distress in Asia. This seminar also draws on the widening cooperation between the BIS and central banks in Asia and the Pacific. We welcome the familiar faces of Michael Davies of the Reserve Bank of Australia and Tientip Subhanij of the Bank of Thailand, important contributors to the Asian research programme of the BIS. Both have worked on aspects of the housing market as research fellows at the BIS Asian Office and published studies jointly with BIS staff economists. We look forward to learning more from them today.

Given the ongoing turmoil in the global financial markets, a seminar on the implications of household debt for monetary policy and financial stability is especially timely. Excessive global liquidity, excessive leverage of financial institutions and excessive complexity of structured finance products all set the stage for the current financial market turmoil. And all of these forces contributed to the housing finance boom that occurred in many mature economies during the past several years. A big challenge for central banks, supervisors and other policymakers is to identify the proper policy responses when the aforementioned financial excesses build up. What should the authorities do in the face of excessive leverage and risk-taking on the one hand, and rapid diffusion of financial innovation on the other?

This joint seminar is very apt because the Bank of Korea and the BIS have, in different ways, taken the lead in addressing this question. In this century, the BIS has been a strong proponent of paying more attention to the relationship between credit growth and asset prices and putting greater emphasis on the macroprudential approach to monetary and financial stability. Policymakers in Korea, for their part, have been at the forefront in deploying a range of instruments to respond to emerging signs of financial imbalances and excesses in the Korean economy. In particular, in the face of a housing boom amid strong inflows of capital in recent years, they have responded not only with monetary policy but also with prudential regulation, credit rules, capital outflow liberalisation and supply measures. In particular, the authorities sought to reinforce norms for down payments (or equivalently, to limit the rise in loan-to-value ratios) in the mortgage market.

The seminar today is also an occasion for policymakers at central banks in Asia to come together and share their thoughts and experiences in handling the policy issues posed by household debt. One can postulate a kind of Kuznets curve whereby a higher level of personal income is associated with higher household debt in relation to income. At the upper right on this curve are the mature markets of Australia and Japan with relatively high debt

[1] Senior Adviser in the Monetary and Economic Department of the BIS. He was Chief Representative of the BIS Representative Office for Asia and the Pacific at the time of the seminar. The views expressed are those of the author and not necessarily those of the BIS.

levels. At the lower left are the less mature markets of China, India and Indonesia. In the middle, we find Korea, Malaysia, Taiwan (China) and Thailand.

In general, convergence to mature market levels of household debt is a welcome sign of improvement in consumer welfare and in the efficiency of the financial sector. This is particularly the case in economies like Korea, where banks for many years neglected household lending in favour of corporate lending. Under these circumstances, it is easy to be complacent when household debt grows very quickly: a stock adjustment process is under way, it is said. However, the catching-up process might not prove to be a smooth asymptote to the Kuznets curve. Instead, a painful boom-bust cycle may occur, as the episode of credit card lending distress in Korea in 2003 demonstrated. Even from a very low base, too fast an adjustment in the stock of consumer debt can overwhelm the capacity of risk management and market infrastructure.

The authorities thus need to work to upgrade risk management and the market infrastructure. In addition, experience shows that at times the authorities may need to encourage the widening of margins of safety, such as limits on leverage or debt service in relation to income and minimum repayment terms. This is particularly so during a transitional period marked by structural changes such as deregulation, intensified competition and increased penetration by global firms. In response to the Korean 2003 credit card lending debacle, Thai policymakers tightened income tests in the fast-expanding local credit card business and avoided a hard landing. By contrast, Taiwanese policymakers relied on the local consumer credit reporting system and suffered a crash of credit card lending in 2006. The recent turmoil in the mature markets testifies to the potential for problems when market participants lose track of basic prudential norms regarding leverage in relation to assets, and debt service in relation to income.

If Asia can manage a deepening of household credit without booms and busts, consumer welfare, economic growth and financial stability will be well served in the region over the coming decades. For some of the biggest Asian markets, such as China, India and Indonesia, this process is at an early stage. Therefore, it is my hope that this joint Bank of Korea/BIS seminar will help central bankers in the region learn from each other about policies related to household debt.

Thank you very much and I wish you all a successful seminar.

Household debt in Australia

Michael Davies[1]

Introduction

Over the past two decades, Australian households' debt levels have increased noticeably and are now fairly high by international standards. The increase in household debt is due largely to the sharp rise in housing debt. This paper first outlines the main drivers of the increase in housing debt: lower interest rates, increased availability of housing finance and strong demand for debt from investors. Next, it discusses the impact of the higher debt levels on households' debt servicing ratios and net worth. Third, it describes the impact of the turbulence in global capital markets on the Australian housing finance market. Last, it briefly discusses some of the implications of the increase in household debt for monetary policy and financial stability.

Trends in household debt

During the 1980s, the ratio of debt to disposable income for Australian households was fairly stable at around 45% (Graph 1). But since 1990, this ratio has risen rapidly, reaching 157% in December 2007. Housing debt accounts for the bulk of the increase, with the ratio of housing debt to disposable income rising from 31% to 134% over the period. By comparison, the ratio of personal debt to disposable income increased from 13% to 22% over the same period. The ratio of debt to assets has also risen sharply over the past two decades, from 8% in December 1989 to 17% in December 2007.

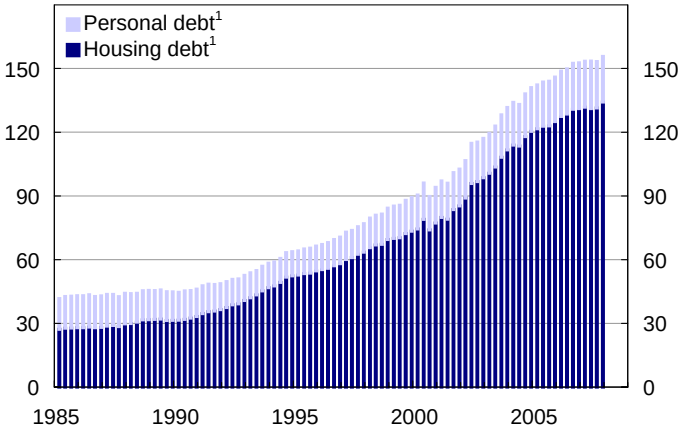
Many advanced economies have witnessed a large rise in household indebtedness over the past two decades. However, the increase in Australia has been particularly pronounced. The ratio of household debt to income in Australia went from being one of the lowest in the advanced economies in the late 1980s to one of the highest in December 2007 (Graph 2).

The ratio of debt to assets in Australia rose from the bottom to the middle of the range for the advanced economies over the same period (Graph 3).

[1] The views expressed in this paper are those of the author, and are not necessarily the views of the Reserve Bank of Australia.

Graph 1

Household debt



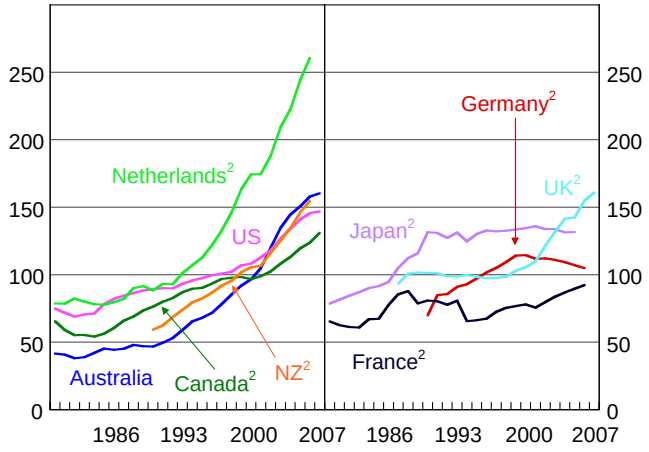
Household sector excludes unincorporated enterprises. Household disposable income is after tax and before the deduction of interest payments.

[1] As a percentage of household disposable income.

Sources: Australian Bureau of Statistics; RBA.

Graph 2

Household debt[1]

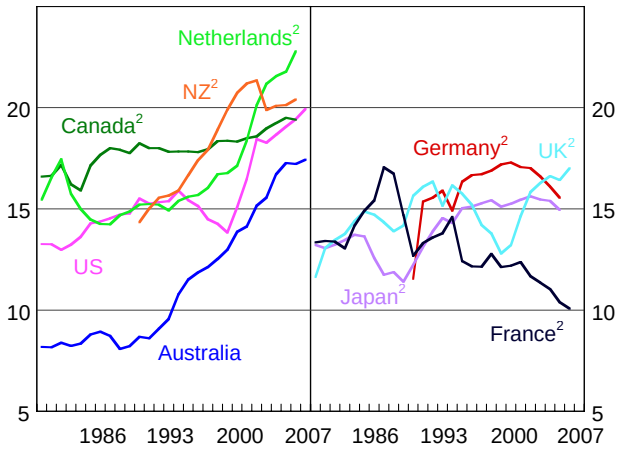


[1] As a percentage of household disposable income.
[2] Includes unincorporated enterprises.

Sources: National sources.

Graph 3

Household gearing ratio[1]



[1] Debt as a percentage of assets. [2] Includes unincorporated enterprises.

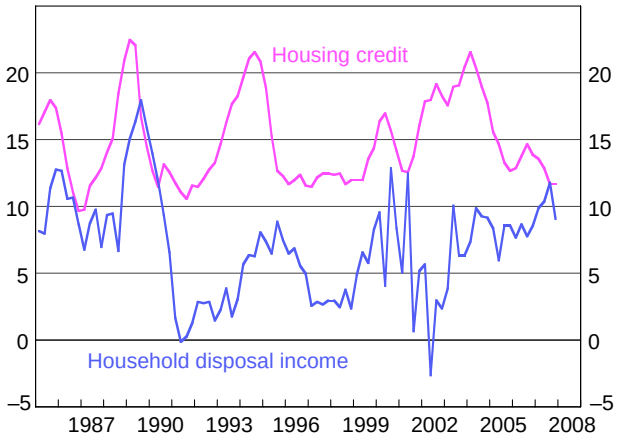
Sources: National sources.

Housing finance market

Given the dominance of housing debt in households' total debt, this paper focuses on the housing finance market. Since 1990, annual growth in housing debt has averaged 15%, with particularly strong growth in 1988–89, 1994 and 2002–04 (Graph 4). This is appreciably faster than the annual growth in household disposable income, which has averaged only 6% over this period.

Graph 4

Housing credit and household disposable income[1]



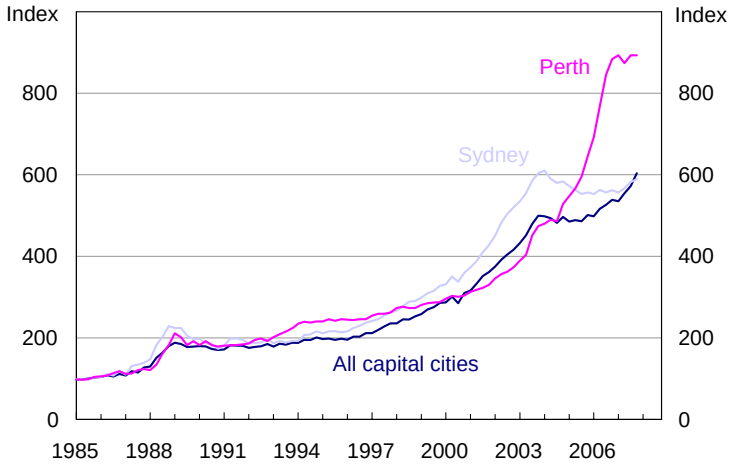
[1] Year-ended percentage change.

Sources: Australian Bureau of Statistics; RBA.

The rapid increase in housing debt has been accompanied by strong growth in house prices. House prices roughly doubled over 1987 and 1988, drifted slowly higher during the first half of the 1990s and more than doubled between 1997 and late 2003 (Graph 5). Since then, house prices (in aggregate) have continued to increase, although there have been markedly different trends across the country – house prices in Sydney have decreased a little, while house prices in Perth have risen strongly, supported by the resource boom.

Graph 5

Median house prices[1]



[1] Quarterly, 1985 = 100.

Sources: RBA; Real Estate Institute of Australia.

Several factors have contributed to the strong growth in housing debt over recent years,[2] the principal one being that lower interest rates in Australia allow households to borrow more when they take out their housing loan. This pushes up the average size of new loans and, over time, the average size of loans outstanding. Between 1989 and 1997 the standard variable mortgage rate fell from 17% to around 7–8%, where it has remained (Graph 6). The fall in mortgage rates was due mainly to the decrease in inflation – and hence in nominal interest rates – but also to a narrowing in lenders' interest margins. The average size of new owner-occupier housing loans has increased from around AUD65,000 (1.6 times annual household income) in 1989 to around $250,000 (three times annual household income). But even though the average loan size has quadrupled, loan repayments as a share of household disposable income are still a little below their 1990 peak.

The effect of the increase in households' borrowing capacity has been reinforced by an increase in the availability of housing finance. During the mid-1990s, specialist mortgage originators entered the housing loan market in Australia.[3] These new institutions competed aggressively for market share by undercutting existing lenders' mortgage rates and by

[2] See L Ellis, S Black and L Dixon Smith, "Housing finance in Australia", background paper for *CGFS Publications,* no 26, "Housing finance in the global financial market," Reserve Bank of Australia, 2005, http://www.bis.org/publ/wgpapers/cgfs26ellis.pdf; I J MacFarlane, "Do Australian households borrow too much?" *Reserve Bank of Australia Bulletin*, April 2003, pp 7–16; Reserve Bank of Australia, "Household debt: what the data show", *Reserve Bank of Australia Bulletin*, March 2003, pp 1–11.

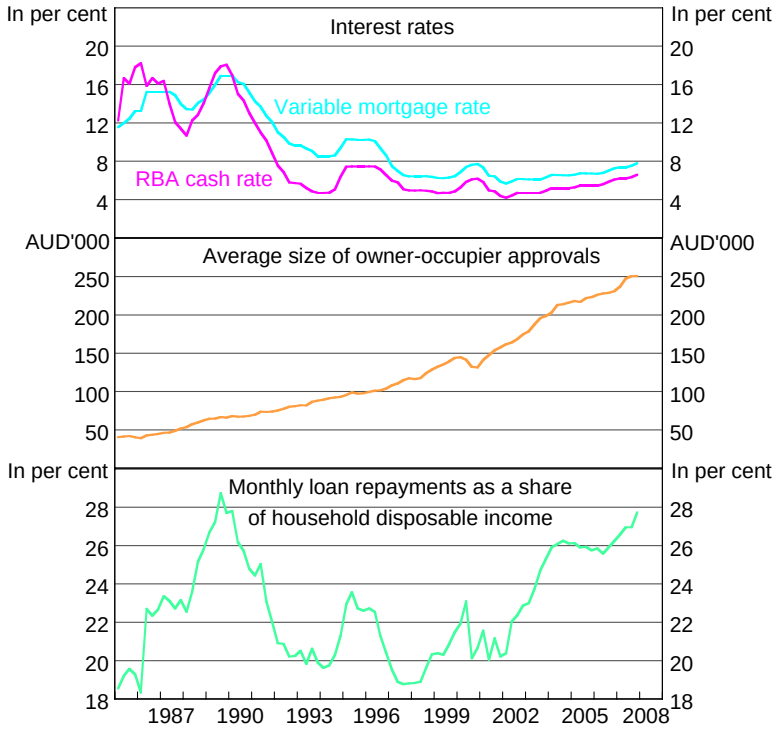
[3] Mortgage originators are specialist non-bank lenders that cannot accept deposits and therefore rely almost entirely on securitisation to fund their housing lending.

introducing new mortgage products such as home equity loans, interest-only loans and loans requiring little documentation. By the early 2000s, mortgage originators' market share had risen to about 10%.

There has also been an increase in the proportion of households with owner-occupier mortgage debt. According to the latest Australian census, 35% of households were paying off an owner-occupier loan in 2006, up from 27% in 1996, with households whose oldest members were between 45 and 64 years old accounting for most of the increase.[4]

Graph 6

Mortgage rates and loan size[1]



[1] Quarterly.

Sources: Australian Bureau of Statistics; RBA.

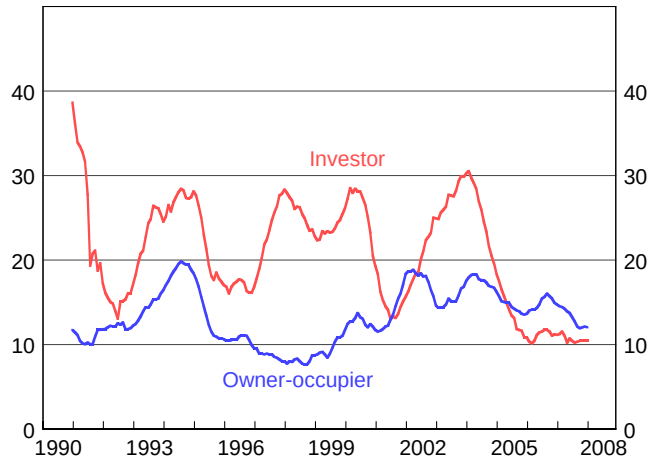
Strong demand for property from retail investors between 1990 and 2003 also made a substantial contribution to the increase in housing debt. Retail investors were attracted to residential property by the consistently strong growth in house prices, weak returns in alternative asset classes such as equities and innovations in the financing and tax treatment of residential property.[5] Much of this investment was funded using debt; between 1990 and 2003, lending to investors grew at an average annual rate of 23%, roughly double the rate of growth in lending to owner-occupiers (Graph 7). Over the past few years, investor demand for housing credit has subsided.

[4] See Reserve Bank of Australia, *Financial Stability Review*, September 2007.

[5] See Reserve Bank of Australia, "Submission to the Productivity Commission inquiry on first home ownership", *RBA Occasional Paper,* no 16, November 2003.

Graph 7

Housing credit growth[1]



[1] Year-ended percentage change.

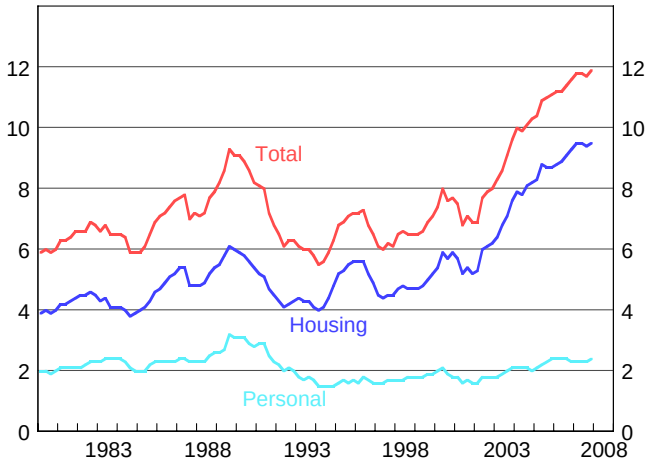
Sources: Australian Bureau of Statistics; Australian Prudential Regulation Authority; RBA.

Financial health of households

With the strong growth in housing debt over the past 15 years, household interest payments increased to a historic high of nearly 12% of disposable income in December 2007 (Graph 8). This is well above the previous peak of 9%, which was recorded in late 1989 when mortgage rates reached 18%.

Graph 8

Household interest payment ratio



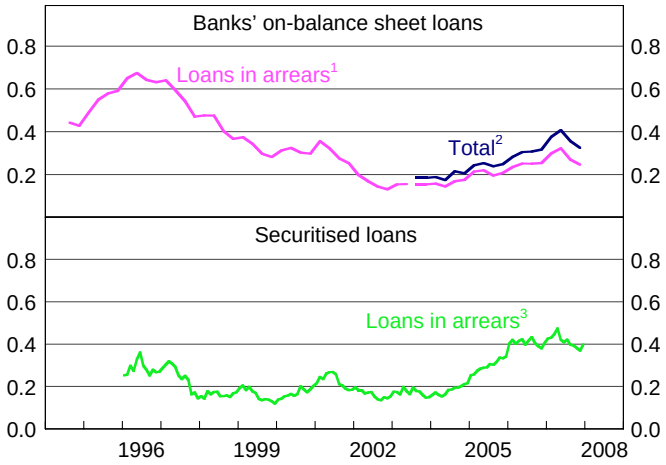
Interest paid as a per cent of household disposable income; excludes unincorporated enterprises.

Sources: Australian Bureau of Statistics; RBA.

However, despite the increase in their indebtedness, very few households are experiencing difficulties meeting their debt repayment obligations. In December 2007, only 0.32% of banks' housing loans (by value) were non-performing (Graph 9). This was down from 0.40% in mid-2007 and not that far above the extremely low level of 0.20% in mid-2003. The 90-day arrears rate on securitised housing loans, about 0.40% in December 2007, has been broadly unchanged since the beginning of 2006, after increasing in 2004 and 2005.

Graph 9

Non-performing housing loans



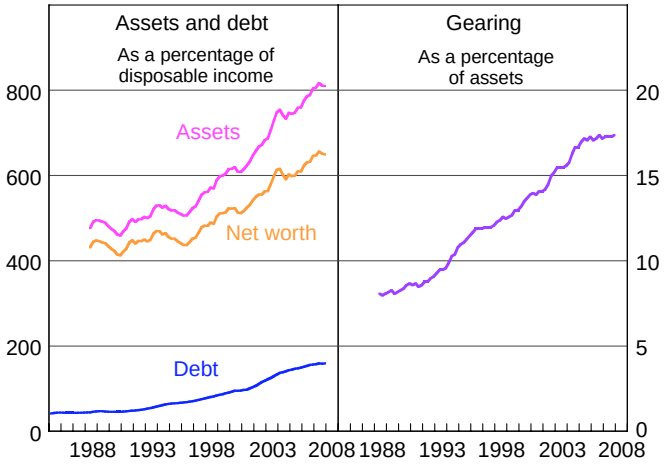
As a percentage of outstanding loans.

[1] Loans that are 90+ days past due but otherwise well secured by collateral. [2] Includes impaired loans that are in arrears and not well secured by collateral. [3] Prime loans securitised by all lenders, 90+ days past due.

Sources: RBA; APRA; Perpetual; Standard & Poor's.

Graph 10

Households' assets and debt



Sources: Australian Bureau of Statistics; Australian Prudential Regulation Authority; RBA.

Households' balance sheets also remain in good shape. Since 1990, the value of households' assets has risen from 4.7 times disposable income to 8.3 times disposable income (Graph 10). The substancial rise in the value of households' assets has more than offsett the increase in household debt. Households' net worth has risen from 4.3 times disposable income to 6.7 times disposable income over the period. The aggregate gearing of the household sector – the ratio of debt to assets – has increased to 17%, but this is still lower than in many comparable countries.

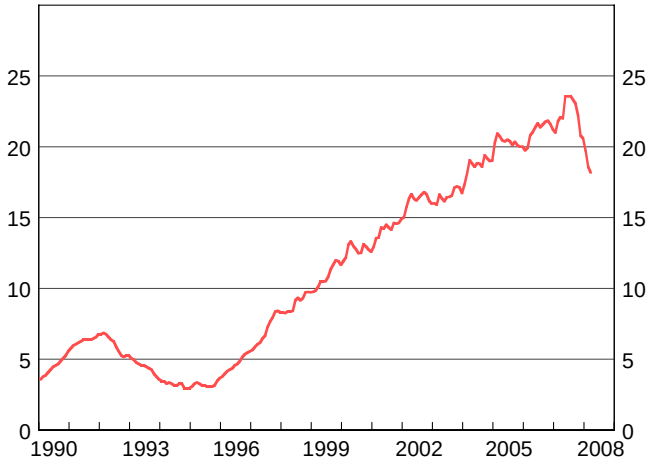
Impact of the turbulence in global capital markets

The turbulence in global capital markets has had a significant impact on the housing finance market in Australia. This is because deposits account for only about half of Australian financial institutions' total funding, with the balance sourced from domestic and foreign capital markets. While the overall supply of housing finance does not appear to have been restricted, there has been a significant change in lenders' market shares, and mortgage rates have risen.

The financial market turbulence has pushed up the cost of most forms of capital market funding and reduced the availability of some, but its impact has been felt the most in securitisation markets. Over the past decade or so, securitisation has developed into an important source of funding for housing loans. In mid-2007, 23% of outstanding housing loans had been securitised, up from 5% in the mid-1990s (Graph 11). Mortgage originators were securitising almost all of their loans, and regional banks, credit unions and building societies had increased their use of securitisation noticeably as it was a cost-effective source of wholesale funding.

Graph 11

Securitised housing loans[1]



[1] As a percentage of total outstanding housing loans.

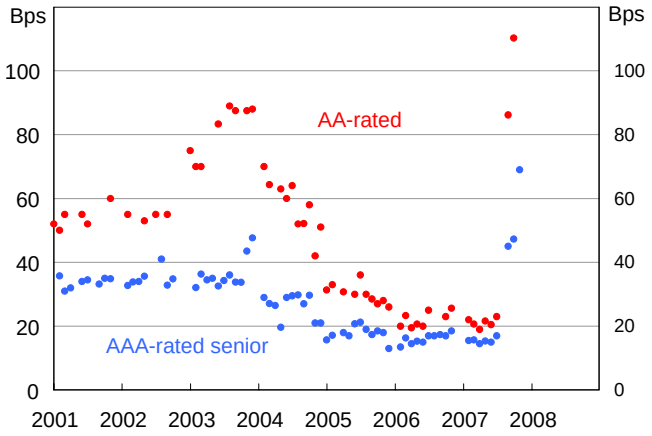
Sources: Australian Prudential Regulation Authority; RBA; Standard & Poor's.

But the securitisation market has been largely closed since the onset of the capital market turbulence in July 2007. For prime residential mortgage-backed securities (RMBS), which account for the majority of Australian asset-backed securities (ABS) issuance, spreads on AAA-rated senior tranches rose from about 15 basis points in mid-2007 to 75 basis points in December 2007 (Graph 12). Spreads on the subordinated AA-rated tranches increased from

about 20 basis points to around 110 basis points. The sharp increase in spreads has occurred even though the Australian housing market remains healthy and investors have never suffered a loss on rated Australian RMBS.[6] This is basically a "lemons" problem – all securitised products are being sold at a discount because investors have become concerned about the product itself.[7] Several structured investment vehicles (SIVs) have also sold RMBS, which has created excess supply in the secondary market.

Graph 12

Spreads on domestically issued prime RMBS

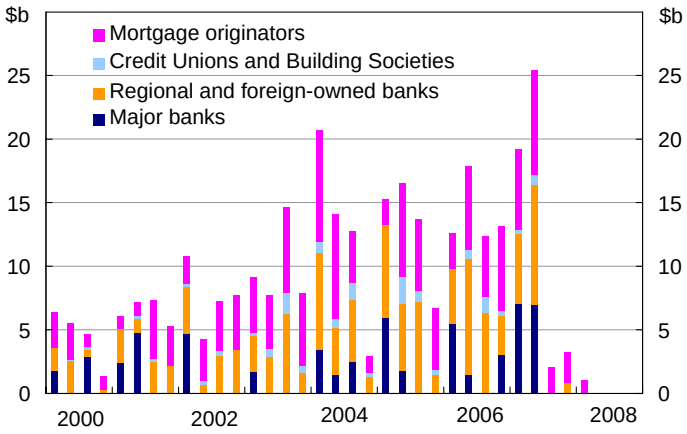


Spread over the bank bill rate; monthly average.

Source: RBA.

Graph 13

RMBS issuance by Australian entities[1]



[1] Quarterly.

Source: RBA.

[6] See Reserve Bank of Australia, "The performance of Australian RMBS", *Financial Stability Review*, March 2006, pp 63–68.

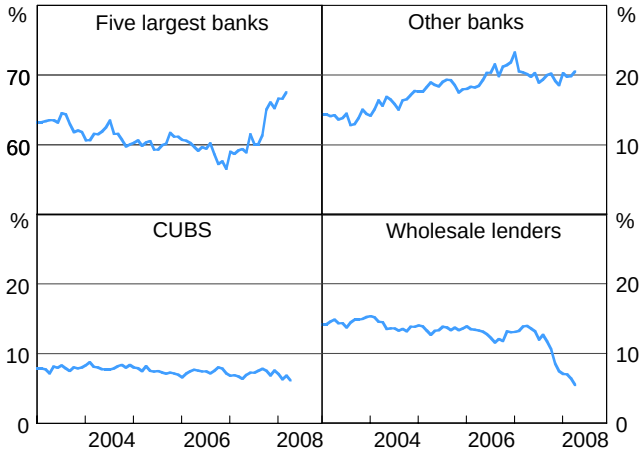
[7] See G Debelle, "Open market operations and domestic securities", address to the Australian Securitisation Forum, Sydney, 29 November 2007.

RMBS issuance has fallen noticeably since the onset of the market turbulence. There was about $2.5 billion of issuance in each of the last two quarters of 2007, compared with about $20 billion a quarter during the first half of 2007 (Graph 13). And in 2008 to date, there has only been one transaction – a $750 million private placement by a mortgage originator.

The inability to issue RMBS at a reasonable price (if at all) has made it much harder for mortgage originators to raise funding, thereby curtailing their ability to compete in the housing finance market. As a result, their share of new housing loan approvals has roughly been cut in half since July 2007, to just 7% (Graph 14). Banks – particularly the five largest – have increased their lending, with their market share rising by 6 percentage points to 86%. The larger banks have been able to increase their lending because they have solid deposit bases, and their strong credit ratings have allowed them to continue to raise short-term and long-term debt in their own names. Credit unions' and building societies' market share has remained at about 7%. The overall volume of new housing loan approvals was little changed over the second half of 2007, but has fallen noticeably over the first few months of 2008.

Graph 14

Share of owner-occupier loan approvals



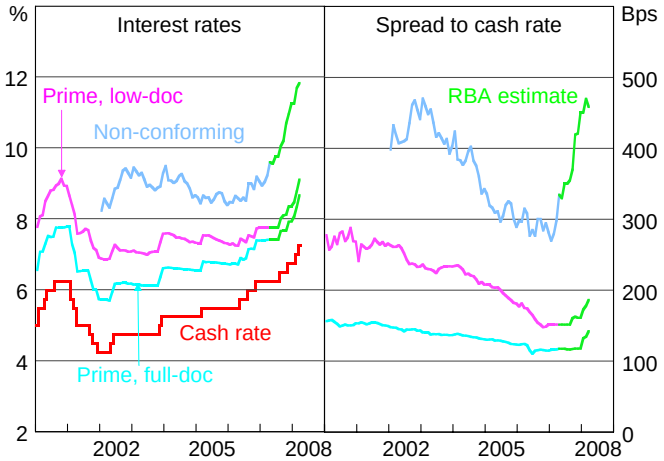
By lender, seasonally adjusted.

Sources: Australian Bureau of Statistics; Australian Prudential Regulation Authority.

Higher wholesale funding costs – both the larger spread between bank bills and overnight index swaps (OIS), and the increase in the spreads over bank bill rates on their new issues of bonds and RMBS – have squeezed lenders' interest margins. Lenders have responded by increasing their mortgage rates by more than the change in the official cash rate. Rates on prime full-documentation housing loans – the highest-quality loans – which account for about 90% of all housing loans in Australia, have risen by about 125 basis points since July 2007, 25 basis points more than the change in the cash rate of the Reserve Bank of Australia (Graph 15). This is unusual; abstracting from discounts, the standard variable indicator rate has moved in lockstep with the cash rate since 2000. Rates on prime low-documentation loans and non-conforming loans, which are the riskier housing loans, have risen by 135 basis points and 210 basis points, respectively.

Graph 15

Variable mortgage rates



Average actual rates paid on new loans.

Estimates are based on movements in advertised rates.

Sources: Perpetual; RBA.

Implications for financial stability and monetary policy

Deregulation and financial innovation have greatly increased the household sector's access to credit. And the strong ongoing performance of the economy has made households more comfortable in taking on debt. Household debt has risen significantly but, overall, household balance sheets remain in good shape, with a substantial rise in the value of assets offsetting the increase in debt.[8] Moreover, most of the increase in debt is held by households that are well placed to service it. Macroeconomic conditions are also favourable: the economy continues to grow at a strong pace, unemployment is low and house prices are rising in most parts of the country. Consistent with this, the share of households experiencing difficulties meeting their debt obligations, while having risen in recent years, remains low relative to history and by international standards.[9]

Also, housing lending has traditionally not been a source of significant risk for the Australian financial system. And a considerable amount of analysis by the Reserve Bank of Australia and other Australian regulators over the past five years suggests that developments to date do not pose a significant risk to Australian financial institutions. This conclusion is based on a series of surveys, stress tests and research projects that shed light on the potential for banks and other financial institutions to suffer significant losses from their housing lending activities.[10]

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[8] See R Battellino, "Some observations on financial trends", address to Finsia-Melbourne Centre for Financial Studies, 12th Banking and Finance Conference, Melbourne, 25 September 2007.

[9] See Reserve Bank of Australia, *Financial Stability Review*, March 2008.

[10] See Reserve Bank of Australia and Australian Prudential Regulation Authority, "Joint RBA-APRA submission to the inquiry into home lending practices and processes", submission to House of Representatives Standing Committee on Economics, Finance and Public Administration, August 2007.

The structure of the Australian housing finance market is such that changes in the Reserve Bank of Australia's cash rate have always flowed directly through to mortgage rates. About 85% of outstanding Australian housing loans are at variable rates. According to the Committee on the Global Financial System (CGFS), this share is quite high by international standards.[11] In countries where variable rates dominate, changes in the policy rate tend to flow quickly through to mortgage rates. In countries where fixed rates are more common, the pass-through to mortgage rates is less clear as the interest rates affecting most borrowers or lenders may be only loosely tied to the policy rate. Also, in Australia variable mortgage rates generally move only when there is a change in the policy rate, rather than being tied to short-term market rates (such as the one-year treasury bond rate and the one-year or six-month Libor) as in the United States. The increase in household debt has, however, made household debt payments more sensitive to changes in interest rates.

The capital market turbulence has increased the influence of non-monetary policy factors on the tightness of financial conditions. As the spread on bank bills over OIS has risen, banks have progressively passed on their higher funding costs to borrowers by increasing their lending rates by more than the increases in the cash rate. Because these higher spreads have been volatile, and the timing and degree of pass-through of these higher spreads to borrowing rates have been uncertain, there has been greater uncertainty about how tight financial conditions will be in the near term.

[11] See Committee on the Global Financial System, "Housing finance in the global financial market", *CGFS Publications,* no 26, Bank for International Settlements, Basel, 17 January 2006.

Household debt, monetary policy and financial stability: still searching for a unifying model

Andrew Filardo[1]

1. Introduction

Household debt has been on a secular rise across a wide range of economies. In many cases, this reflects the deepening of financial markets and, in particular, the ability of households to tap human and non-human wealth in ways that had not previously been available. A key policy question is whether there is a downside to such developments, ie do they represent key sources of risk to the macroeconomy and how best can these issues be modelled?

An optimistic view is that the trend is generally good for households, reflecting a sounder economic and financial environment. A less optimistic view is that the debt trends indicate an increased vulnerability for household balance sheets, as households leverage against high and rising asset prices (eg real estate and stock markets). If asset prices prove to be largely unsustainable, households could find themselves saddled with debt overhangs and heavy debt servicing costs.

At the aggregate level, such household vulnerabilities raise the risks of triggering an economic slowdown or, worse still, of amplifying an initial economic slowdown into a disorderly downward slide. In the worst case, downside pressures could mount as property foreclosures and personal bankruptcies multiply in a systemic way with serious macroeconomic consequences, not least being a vicious recession, a financial spiral and deflation. Arguably, the unfolding financial strains in global markets since last summer underscore the seriousness of such possibilities.

Questions naturally arise for central banks. What is the appropriate policy regime to address the new environment? And, in particular, how should central banks react as vulnerabilities rise and as worst case scenarios materialise? At their heart, these questions raise complex issues associated with the nexus between monetary and financial stability.

To shed some light on the current debate, this article offers a monetary policy perspective on these issues. Section 2 presents a pedagogical monetary policy model that features fundamental and non-fundamental asset prices and household debt with which to illustrate some of the potential trade-offs that central banks face. Section 3 discusses how to extend the model to incorporate financial stability issues. Section 4 concludes that central banks can, and in many cases should, incorporate the information about household debt in setting policy rates and in assessing the policy risks.

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[1] Andrew Filardo is the BIS Head of Economics Asia & Pacific. The views expressed are those of the author and not necessarily those of the BIS. The author is grateful to Claudio Borio, Piti Disyatat, Prasanna Gai, Hans Genberg, David Vestin and seminar participants at the Federal Reserve Bank of Kansas City and the BIS for useful comments and suggestions, and Marek Raczko for excellent research assistance.

2. Adding household debt into a benchmark monetary policy model: in search of a special role

To explore the ways in which household debt might influence policy trade-offs from a modelling perspective, it is important to consider the various ways in which household debt affects the components of aggregate demand. The microeconomics literature suggests that household debt can affect consumption decisions via various channels, not least through debt servicing costs as interest rates change, borrowing constraints imposed by financial institutions and the influence on consumers' perceptions about how the debt may impinge upon their ability to achieve lifetime consumption goals.

Despite the micro evidence, household debt has typically played a minor role, if any, in benchmark monetary policy models. In part, the reason for this arises from the tendency of macroeconomic modellers to see household debt as not only an endogenous variable reflecting intertemporal consumption and saving decisions but also as a passive one. Addressing this shortcoming, this section first sketches out a simple benchmark monetary policy model with a passive role for household debt before considering various ways in which household debt may play a more active role, as a driver of the aggregate demand and then as an indicator of boom-bust cycles.

A benchmark monetary policy model

This section begins by extending the optimal monetary policy model of Filardo (2007) to include consideration of household debt. At its heart, the model comprises several interrelated blocks of equations which provide a means to explore some of the theoretical trade-offs of a central bank in an economy subject to typical cyclical fluctuations as well as boom-bust asset price dynamics. Specifically, there is a macroeconomic block, an asset price block, a household debt block and a monetary policy block, all of which are discussed in turn.

Macroeconomic block

The macroeconomic block is an extension of the Rudebusch and Svensson (1999) model incorporating a vector of asset prices. The demand side of the model is assumed to have a standard IS curve specification. Inflation fluctuations are modelled as a standard backward-looking Phillips curve (PC) with an additional source of inflation coming from asset prices. As specified, it is only the non-fundamental, or bubble, component of asset prices that contributes to inflation, above and beyond what is already captured in the output gap or past inflation rate. The specification is adopted to capture the stylised fact that many past asset price booms were often associated with fairly benign inflation behaviour. Algebraically, the first block of the system is represented compactly as follows:

$$\begin{aligned} &\textit{Macro block} \\ &(IS) \quad y_t = -\gamma r_{t-1} + \theta y_{t-1} + \boldsymbol{\varphi}\left(\boldsymbol{\pi}_{AP,t-1} - \boldsymbol{\pi}_{t-1}\right) + \boldsymbol{\psi}_y \mathbf{Z}_{t-1} + \varepsilon_t \\ &(PC) \quad \pi_t = \pi_{t-1} + \alpha y_{t-1} + \boldsymbol{\beta}\boldsymbol{\pi}_{NF,t-1} + \boldsymbol{\psi}_\pi \mathbf{Z}_{t-1} + \eta_t \end{aligned} \tag{1}$$

where $\boldsymbol{\varphi} = (\phi_e, \phi_h)$ and $\boldsymbol{\beta} = (\beta_e, \beta_h)$; y is the output gap, r is the interest rate controlled by the monetary authority, π is the inflation rate, $\boldsymbol{\pi}_{AP}$ is a vector of the rates of asset price appreciation, which in turn is a function of $\boldsymbol{\pi}_F$ (the rate of change in asset prices attributable to fundamentals) and $\boldsymbol{\pi}_{NF}$ (the rate of change in asset prices attributable to the bubble component of asset prices). **Z** is a set of exogenous variables that may be useful to predict output and inflation.

To be more specific, the real return on asset prices in the *IS* equation captures the potential channels of asset prices, eg equity and housing price inflation, on consumption (via a real or perceived wealth effect), investment (via a cost of capital effect) and government spending (via a tax revenue effect). The linkages are kept fairly simple and linear in order to keep this block of equations relatively easy to manipulate and interpret. The error terms in the *IS* and *PC* equations are assumed to be normally distributed with a zero mean and a fixed variance.

Asset price block

The simplicity of the first two equations stands in contrast to the asset price specification. As is evident from cross-country experiences with boom-bust type asset price behaviour, the associated dynamics can have a great and non-linear impact. Incorporating such dynamics enriches the range of monetary policy reactions that can be explored. It also allows us to consider various channels through which household debt can interact with asset price and macroeconomic dynamics.

Without loss of generality, we assume a bivariate asset price specification; clearly, this can be easily extended to a greater number of asset prices. In light of recent history, it is natural to think in terms of equity price and housing price developments. The components of the asset price block have the following specification:

$$\begin{array}{l} \textit{Asset price block} \\ (AP)\ \boldsymbol{\pi}_{AP,t} = \boldsymbol{\pi}_{F,t} + \boldsymbol{\pi}_{NF,t} \end{array} \tag{2}$$

where

$$(F)\quad \boldsymbol{\pi}_{F,t} = \begin{pmatrix} \pi^{e}_{F,t} \\ \pi^{h}_{F,t} \end{pmatrix} = i\pi_{t-1} + \begin{pmatrix} \lambda^{e} \\ \lambda^{h} \end{pmatrix} y_{t-1} + \begin{pmatrix} \nu^{e}_{t} \\ \nu^{h}_{t} \end{pmatrix} \tag{3}$$

$$(B)\quad \boldsymbol{\pi}_{NF,t} = \begin{pmatrix} \pi^{e}_{NF,t} \\ \pi^{h}_{NF,t} \end{pmatrix} = \zeta_{t}(y_{t-1}, r_{t-1}) \tag{4}$$

where *i* is a unit vector, $(\lambda^{e}, \lambda^{h})$ are coefficients and $(\nu^{e}, \nu^{h}) \sim N(0, \sigma^{2}_{j}),\ j = \{e, h\}$.

The fundamental components of asset prices (F) are assumed to have a simple structure. The real growth rate of housing and equity prices is proportional to output, *y*. More complicated functions can be constructed but this is suppressed for simplicity. The non-fundamental, or bubble, components (B) are modelled as endogenous, non-linear random functions of output and interest rates.

One important feature of this bubble specification is that monetary policy can directly and indirectly influence the (transition) probability of bubbles. Higher interest rates would directly lower the probability that a bubble would continue and would indirectly lower it by slowing down economic growth. One interpretation of this endogenous behaviour is that central banks, via its policy rates, can prick asset price bubbles.[2] More details about $\zeta(y_{t-1}, r_{t-1})$ are

[2] It might be more accurate to say that central banks can "stochastically" prick asset price bubbles in this model. In particular, central banks in this model cannot control the exact level of the bubble, but can alter the conditions that foster bubbles. For example, higher policy interest rates raise the probability that a bubble will collapse. In expectation terms, higher interest rates lower the expected duration of bubbles, and hence lower their expected size. By way of contrast, other modeling approaches typically downplay this stochastic element; for example, see Bernanke and Gertler (1999, 2001), Cecchetti et al (2000, 2003), Gruen et al (2003) and Kent and Lowe (1997).

described below. As will be seen, the non-linearity implied by this assumption introduces interesting non-linear dynamics and enriches the types of trade-offs that the hypothetical monetary authority faces in such an environment.

Household debt block

The simplest assumption to address household debt issues is to append the macroeconomic block with an equation for the law of motion of debt. Without loss of generality, we can assume that household debt evolves as a function of output, inflation and interest rates:

$$\textit{Household debt block}$$

$$(D) \quad D_t = \kappa_0 + \kappa_y y_{t-1} + \kappa_\pi \pi_{t-1} + \kappa_r r_{t-1} + \xi_t \tag{5}$$

It is useful to note that debt plays a passive role in this simple extension of the benchmark model; while household debt may vary with the state of the economy it does not feed back into the macroeconomic block or the asset price block. In a sense, this assumption would be valid if debt levels were not considered important drivers of macroeconomic behaviour. This is consistent with standard consumption theory. In theory, debt is not a driving variable unless it is so large that the transversality condition for the consumer's intertemporal budget constraint becomes an issue.[3] Subsequent sections examine the policy implications of debt playing an active role.

Monetary policy block

Given this structure of the macroeconomy and asset price and debt dynamics, the monetary authority's challenge is to choose a policy interest rate that minimises the weighted average of the variance of output, inflation and the change in interest rates, that is, the monetary authority's loss function:[4]

$$\textit{Monetary policy block}$$

$$L = \text{var}(y) + \mu_\pi \text{ var}(\pi) + \mu_r \text{ var}(r - r_{-1}) \,. \tag{6}$$

For this specification of the household debt dynamics in equations (1), (2) and (5), the optimal policy rule would have the form of:

$$(R) \quad r_t = a_y y_t + a_\pi \pi_t + \mathbf{a}_F \boldsymbol{\pi}_{F,t} + \mathbf{a}_{NF} \boldsymbol{\pi}_{NF,t} \tag{7}$$

where the parameters of the policy rule would solve the following optimisation problem:[5]

$$\underset{\{a_y, a_\pi, \mathbf{a}_F, \mathbf{a}_{NF}\}}{\text{argmin}} L \text{ subject to equations } (1),\ (2) \text{ and } (5) \,. \tag{8}$$

The policy implications for household debt are rather stark. In the benchmark model, the optimal interest rate rule does not include household debt. This is because household debt plays no role in driving output and inflation dynamics. The basic message from this simple model is that household debt will only matter to the extent that it affects the dynamics of

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[3] Moreover, in aggregate consumer versions of closed-economy macroeconomic models, (net) debt is typically assumed to be zero.

[4] The variance of the change in the interest rate is included to reflect the general desire of central banks to smooth interest rate fluctuations. Part of this desire might reflect financial stability concerns.

[5] See eg Chow (1978).

inflation, output and asset prices. If we were to extend the model to make it forward-looking, ie build in expectations, the same type of intuition would result: household debt would only matter to the extent that it predicts inflation, output and asset prices.[6]

Two extensions of the benchmark model

Various extensions of the benchmark model to include household debt can be motivated by empirical observations. Two stem from the role of household debt in household liquidity constraints and as an indicator of boom-bust dynamics.

Household debt and liquidity constraints

Household debt may play a significant role in the propagation of macroeconomic shocks via borrowing constraints in the lending channel. Higher debt levels, all else the same, would lower net worth and therefore raise the cost of borrowing.[7] Debt levels can also increase the incidence of credit rationing. In these ways, household debt levels can affect aggregate consumption and therefore impact business cycle dynamics.[8]

This consideration suggests that economies facing significant liquidity constraints might be better represented by an IS curve (equation (1)) that includes a household debt (here thought of as a deviation of the household debt-to-income from its steady state ratio) variable:

$$(IS') \quad y_t = -\gamma r_{t-1} + \theta y_{t-1} + \boldsymbol{\varphi}\left(\boldsymbol{\pi}_{AP,t-1} - \boldsymbol{\pi}_{t-1}\right) + \beta D_{t-1} + \boldsymbol{\psi}_y \mathbf{Z}_{t-1} + \varepsilon_t .$$

In this equation (*IS'*), the coefficient on household debt would generally have a negative sign, reflecting the influence of borrowing costs and credit rationing on output. In this case, the resulting policy rule would change to include a reaction to household debt:

$$(R') \quad r_t = a_y y_t + a_\pi \pi_t + \mathbf{a}_F \boldsymbol{\pi}_{F,t} + \mathbf{a}_{NF} \boldsymbol{\pi}_{NF,t} + \mathbf{a}_{D,L} D_t .$$

In general, the policy rule (*R'*) coefficient on household debt is negative, suggesting that as household debt rises, monetary policy should optimally be eased, all else the same.[9]

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[6] See Disyatat (2005) for such a derivation and discussion.

[7] See Bernanke, Gertler and Gilchrist (1999). Debelle (2004) notes that lower interest rates and less binding liquidity constraints have helped to boost household debt levels worldwide. Higher household debt levels, especially in economies dominated by variable rate loans, have increased the macroeconomic sensitivity to changes in interest rates, income and asset prices. In a fully articulated Dynamic Stochastic General Equilibrium (DSGE) model, this is analogous to the "collateral constraint effect" in Monacelli (2006). Bordo and Jeanne (2002) argue in a somewhat different equilibrium model that the non-linearity implied by collateral constraints suggests a more complicated class of optimal policy rules.

[8] Assenmacher-Wesche and Gerlach (2008) could be interpreted to raise empirical doubts about the significance of such a channel. Using cross-country data, they find little difference in the response of output to monetary policy shocks in low versus high mortgage debt-to-GDP ratio economies.

[9] It is important to note that the rise in household debt in this comparative static exercise should be interpreted carefully. The thought experiment is one where a household wakes up and finds that its debt obligations have risen in a way largely independent of the economy. Such an exogenous shock would lower net worth and would set in motion economic weakness, both through a traditional wealth effect channel and because of tighter liquidity constraints that would further depress output, inflation and asset prices. In such a situation of an exogenous increase in debt, the monetary authority would ease monetary policy to cushion the blow to the macroeconomy. See also Akram and Eitrheim (2006) for an alternative specification for debt in the macroeconomic block.

This should be contrasted with the benchmark model. In the benchmark model, debt is modelled as being passive, ie debt is correlated with the state of the economy but does not influence the dynamics. In such a setting, a monetary authority can simply respond to the output, inflation and asset price dynamics, but ignore household debt levels. In other words, household debt in the benchmark model does not contain marginally useful information above and beyond that already contained in output, inflation and asset prices. But in this extension of the model, household debt does provide useful information for policy. The key question is how best to evaluate and respond to the marginal value – which, ultimately, is an empirical question.

Household debt as an indicator of boom-bust behaviour

Alternatively, household debt can be seen as a potential indicator of boom-bust behaviour. As an indicator, it would not necessarily be a direct driver of inflation and output but rather would act as an indicator of the conditions that foster frothy asset price valuations, ie asset price bubbles.[10] Graph 1 illustrates, using data going back a few decades, that there is a strong correlation during boom periods.

To capture the basic characteristics of such a link to boom-bust dynamics, one can augment the asset price block to incorporate household debt. Ideally, it would not be household debt per se that would be added to equation (4), but rather some unobserved variable $\tilde{D}_{t-1}$ that reflects the portion of household debt that is out of line with fundamentals:[11]

$$(B') \quad \boldsymbol{\pi}_{NF,t} = \begin{pmatrix} \pi^{e}_{NF,t} \\ \pi^{h}_{NF,t} \end{pmatrix} = \zeta_t(y_{t-1}, r_{t-1}, \tilde{D}_{t-1}(D_{t-1})) \tag{9}$$

In this case, the resulting optimal policy rule would include a reaction to household debt:

$$(R'') \quad r_t = a_y y_t + a_\pi \pi_t + \mathbf{a}_F \boldsymbol{\pi}_{F,t} + \mathbf{a}_{NF} \boldsymbol{\pi}_{NF,t} + \mathbf{a}_{D,NF} \tilde{D}_t(D_t) .$$

In general, the coefficient on excessive household debt in (*R''*) would be positive, indicating that, as excessive household debt rises, monetary policy should be tightened. This stands in contrast to the incentives to ease as liquidity constraints tighten.

The implications for policy reactions to debt would be somewhat complicated and would depend on the assumed drivers of debt, ie the nature of the shocks hitting the economy. Two examples illustrate the difficulties.

In the case of a house price-debt spiral, ie the mutually reinforcing dynamic owing to the role of housing prices as collateral and of easier access to credit as a driver of housing prices, central banks should respond to higher debt with higher policy rates in this model. Rising stock market valuations would also feed this process. In a nutshell, higher debt adds to the frothiness of asset price bubbles and, in turn, signals the rise in the unobserved measure of excess debt $\tilde{D}_{t-1}$. This is a traditional channel that can lead to strong boom-bust cycles.

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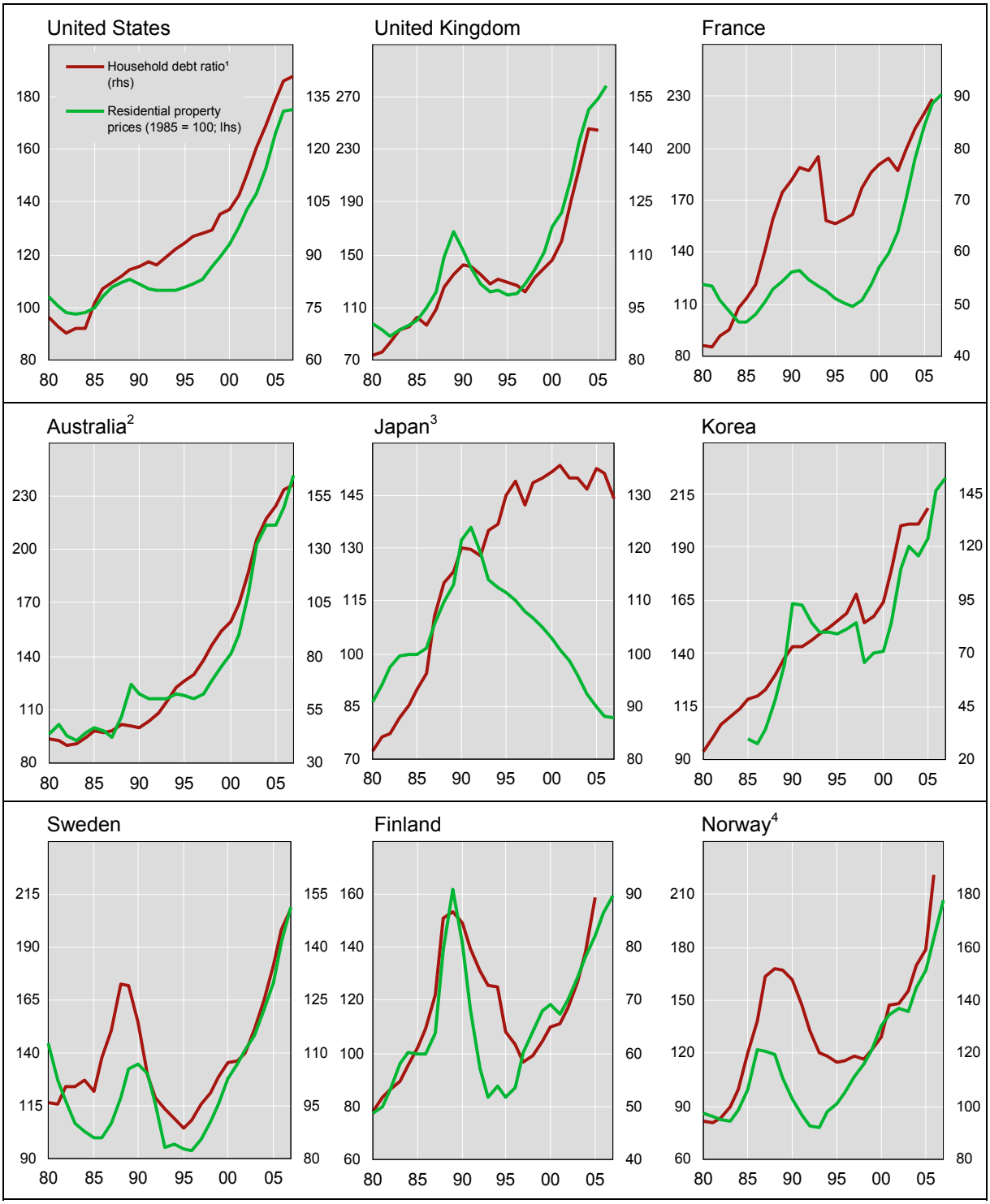
[10] It is also possible that a debt-asset price self-reinforcing process, on the way up as well as on the way down, could be part of the story.

[11] The unobserved variable, $\tilde{D}_{t-1}$, could, in principle, be estimated using a probit model, applying methods advocated in Filardo and Gordon (1999).

Graph 1

Residential property prices and household debt



[1] Total financial liabilities of personal sector and non-profit institutions serving households as a percentage of household disposable income. [2] Total household debt as a percentage of household disposable income. [3] Structural break in 1996. [4] Household domestic debt as a percentage of household disposable income.

Sources: OECD, *Economic Outlook*; CEIC; national data.

Alternatively, higher household debt might be seen as largely reflecting, rather than driving, unsustainable asset prices. However, higher household debt levels could still contribute to the fragility of the economic and financial environment if asset prices were to suddenly collapse. A bursting bubble would likely lead to recession and hence increasing difficulties in servicing the debt. Such adverse outcomes would still indicate that a bubble was growing and excessive debt $\tilde{D}_{t-1}$ accumulating. This, according to the model, would call for a tighter policy response during the build-up phase because of the increased vulnerabilities. The absence of the asset price-debt amplification mechanism indicates a boom-bust dynamic, but of a less virulent nature than the previous example.

Of course, one could not rule out a priori that soaring asset prices reflected fundamentals and household debt rose in response. This could occur in the case of improved productivity. In such a situation, no policy reaction to debt movements is called for because the higher household debt would not necessarily raise $\tilde{D}_{t-1}$.[12] This possibility underlines the practical difficulties for central banks in diagnosing rising asset prices and debt as representing fundamentals or non-fundamentals. While diagnosing imbalances at central banks has benefited from research efforts over the past decade, it still remains a daunting task and further efforts are called for.

Several key policy implications, deriving in part from the multiple bubble aspect of model, are worthy of note.

First, this model indicates that monetary policy should be tightened during periods of rising household debt. Higher debt increases the probability of asset price bubbles, which tend to lead to economic overheating. As a consequence, higher interest rates are called for not only to cool down aggregate demand via the interest rate channel but also to raise the chances of pricking the asset price bubbles. In terms of expectations of the asset price bubbles, higher interest rates reduce the expected speed and ultimate size of the correction.

Second, this model underscores the possibility that price stability might not be enough to ensure macroeconomic stability. As has been seen in various economies around the globe at different times, the co-movement of asset prices and strong economic growth need not result in higher inflation or inflation expectations during the build-up phase.[13] As a consequence, a natural feedback from inflation to tighter monetary policy appears to be broken. This possibility could lead to particular difficulties, especially with respect to communication, for central banks following an explicit inflation targeting framework and facing sharply rising household debt and asset prices.

Third, the collapse of an asset price bubble would generally call for a sharp easing of monetary policy. If a household debt overhang ensues, a stronger policy reaction would be called for, in part because an overhang might lead to rounds of fire sales of assets. Note that the apparent asymmetry of the monetary policy reaction – slowly tightened during the build-up and rapidly eased after the bust – does not reflect the time-varying preferences of the central bank but rather the fact that asset price movements are slow to rise but quick to decline. Paraphrasing Greenspan (1999), monetary policy is not asymmetric, asset prices are.

Fourth, while a sharp easing of monetary policy is important, it is crucial that the reaction should not be too sharp. In a world of multiple bubbles, policy actions that are too aggressive with respect to one bubble collapsing may unwittingly sustain another bubble, and even

[12] It should be noted, however, that if trend productivity steepened, the natural rate of interest would tend to rise, thereby calling for a higher policy rate, all else the same.

[13] For a more detailed analysis of this perspective, see White (2006).

stoke the pressures for still loftier prices. One could argue that the low interest rate environment in the early part of the decade – when policy interest rates were too low for too long – contributed to the unsustainably high real estate prices and abetted the self-reinforcing debt-asset price cycle.[14] Policy efforts focused too sharply on easing the strains in one sector of the economy may lead to a build-up of vulnerabilities in another. The moral here is that policymakers need to be always mindful of the unintended consequences of their actions.

A couple of caveats are worth mentioning. First, the modelling approach abstracts from the ultimate source of the drivers of the boom-bust behaviour. History suggests that there are several possible sources such as the central bank, the banking sector, prudential regulators and borrowers themselves. For example, overly expansive monetary policy may create excess liquidity. The banking sector might systematically underestimate the risks and extend credit on too lenient a basis. Financial liberalisations might lead to excessive credit creation especially if prudential norms prove to be obsolete after financial liberalisations. And, last but not least, borrowers may overestimate their capacity to repay loans and become over-leveraged, only to discover later that it just wasn't the case.

These various sources suggest that there could be gains from monitoring each as a means to better understand the nature of the frothiness in asset markets, rather than relying solely on aggregate household debt statistics or some other quantitative measure of unsustainable lending. Progress at central banks with respect to financial stability monitoring is moving in a positive direction.

Second, the modelling approach above emphasises quantitative measures of financial vulnerabilities but this should not be seen as discounting the potential role of price measures. In some instances, price measures might be even more reliable. Indeed, the availability of a wide range of interest rate and swap spreads (eg CDS premia, TED spreads, Libor-OIS spreads) at the touch of a computer screen suggest price measures may be essential in real-time crisis management. That said, it is not clear that such spreads are always reliable at signalling a low-frequency building of financial imbalances. This would be particularly true if asset price frothiness were due to unsustainably high risk appetites, which, arguably, has been an important part of the story behind the turmoil in financial markets in 2007–08. Overall, both quantitative and price measures of financial market stress are likely to be important, if only as cross-checks on the more disaggregated evidence. The key challenge is to model these financial conditions indexes in a reliable manner.[15]

3. Factoring in financial stability concerns

The current policy debate in many central banks goes beyond consideration of the narrow macroeconomic stabilisation issues. Since the start of the financial turmoil of 2007, central banks have had to look to all the tools at their disposal to address the various risks that have flared up. The old adage that necessity is the mother of invention comes to mind. Indeed, central banks have been facing daunting challenges in part because financial innovations over the past decade have so altered the monetary transmission mechanism that new tools, or at least new practices, have been called for. New auction facilities have been created. Eligible collateral standards have been relaxed. New coordinated central bank swap lines have been adopted by major central banks.

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[14] A detailed analysis of the multiple bubble model without household debt is found in Filardo (2007).

[15] See, for example, Goodhart and Hofmann (2001). For an alternative method that focuses on financial market stress, see Illing and Liu (2006).

While it is still too early to evaluate fully the actions taken to date, it is nonetheless clear that central banks have the ability, the authority and the willingness to take strong actions in pursuit of financial stability. These actions, however, have not been undertaken without some trepidation of mission creep – that is, taking actions that go well beyond the key mandate of price stability. Could such actions by central banks raise credibility issues? Could such actions be taken by some other, perhaps more appropriate, regulatory agency or government body? These questions raise deep and difficult issues, especially those associated with moral hazard, the consequences for the resilience of financial markets and the appropriate use of lender of last resort powers.

While debates of these issues are likely to go on well after the current financial turmoil subsides, a more immediate concern arises from consideration of the appropriate use of policy interest rates as yet another tool to help fix the financial problems. Lower policy rates and the associated boost in liquidity could help to cushion financial markets, ease debt financing burdens and facilitate the cleanup process. While such actions could also help to boost the macroeconomy by strengthening economic and financial fundamentals and by bolstering confidence, easier monetary policy could increase the risk of weakening its commitment, actual or perceived, to price stability.[16]

The article now turns to modelling financial stability concerns in order to analyse some, but certainly not all, of the trade-offs facing central banks. To preview the findings, the model will provide rather stark implications about the potential benefits of expanding central bank mandates beyond price stability and will offer a rationale for such actions.

Three extensions of the benchmark model

This section focuses on three different extensions of the benchmark model to highlight some insights about the trade-offs central banks face, particularly when addressing concerns about financial stability via the setting of policy interest rates. The first addresses how a central bank might explicitly factor in central bank concerns/mandates about financial stability. The second sheds some light on the quandary in which central banks might find themselves when authorities other than the central bank cannot or will not react to financial stability concerns in a timely fashion. The third speaks to the special complications arising from high impact, low probability risks (ie tail risks).

Factoring in general concerns about financial stability

A way to conceptualise the central bank concerns about financial stability is to alter its preferences with respect to output, inflation and interest rate volatilities. In terms of the model above, this would translate into a modification of equation (6). The simplest case to consider would be to merge the preferences for both monetary stability (MS) and financial stability (FS) in an additive fashion:

$$
\begin{aligned}
L_{MS} &= \mathrm{var}(y) + \mu_{\pi}^{MS}\,\mathrm{var}(\pi) + \mu_{r}^{MS}\,\mathrm{var}(r - r_{-1}) \\
L_{FS} &= \mu_{y}^{FS}\,\mathrm{var}(y) + \mu_{\pi}^{FS}\,\mathrm{var}(\pi) + \mu_{r}^{FS}\,\mathrm{var}(r - r_{-1}) \\
L = L_{MS} + L_{FS} &= (1 + \mu_{y}^{FS})\,\mathrm{var}(y) + (\mu_{\pi}^{MS} + \mu_{\pi}^{FS})\,\mathrm{var}(\pi) + (\mu_{r}^{MS} + \mu_{r}^{FS})\,\mathrm{var}(r - r_{-1})
\end{aligned}
\tag{10}
$$

In this case, the qualitative results of Filardo (2007) would still hold in the sense that the functional form of the central bank's loss function is the same up to the particular values of

[16] See Borio and Lowe (2004), Borio and White (2003) and Roubini (2006) for a further discussion of these issues. See Gertler (2003) for a more sceptical view.

the weights on inflation, output and interest rate volatility.[17] In light of the typical concerns associated with financial stability, measures of financial vulnerabilities such as household debt burdens would naturally show up prominently in the modelling efforts, especially when thinking about medium-term risks.[18]

Quantitatively, however, financial stability concerns would probably entail the placing of greater relative weight on economic stability versus inflation stability. This would naturally suggest more aggressive actions to smooth output, especially when boom-bust dynamics were particularly worrisome.

This shift is not a unique implication of this model but would generally be the case when one instrument (ie the policy rate) is used to trade-off multiple goals. Greater emphasis on financial stability would imply a tilting of central bank actions away from a narrow mandate of inflation stability.[19] From theory, it may be inadvisable to design frameworks which suffer from this policy assignment dilemma. Arguably though, putting weight on financial stability concerns alongside those of price stability is already business as usual at most central banks. What this model does is provide a more explicit framework with which to explore the possible trade-offs.

Compounding this assignment problem are the associated practical communication issues. Explaining the subtleties of policy decisions arising from the nexus between monetary and financial stability raises the level of complexity of public discourse and hence increases the risk of miscommunication.

It is important to note, however, that the analysis based on equation (10) is simplified greatly by assuming that central bank preferences can be adequately "mapped" in an additive fashion into variances of output, inflation and interest rates.[20] Much can be gained from analysing the monetary policy trade-offs under this assumption, but there are important limitations implied by this assumption about the nature of financial vulnerabilities. In particular, the setup of the model implies that the optimal policy should focus on changes in the expected values of the targeted variables. While this might prove to be sufficient in some situations, it is also possible, if not more likely, that major concerns about financial stability

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[17] That is, the qualitative results are preserved under affine transformations of the loss function.

[18] This assumes that the underlying structure of the macroeconomic, asset price and debt blocks of the model outlined in section 2 is appropriate. For a pedagogical discussion of alternative central bank preferences for financial stability, this might be fine, but it skirts the deeper issues of how best to add a financial sector into the model and how best to define financial stability. A full treatment of the issues would include microeconomic justification of the underlying theories that lead to financial instability (see, for example, Allen and Gale (1999, 2007) and Gai et al (2008)) and the nature of the externalities that call for government regulation in general and actions from the central bank in particular. Goodhart and Tsomocos (2007) in a special journal issue on the theory and applications of financial stability highlight various current approaches to provide a more rigorous definition of policy-relevant financial stability. There are additional issues about how to translate financial stability in a meaningful macroeconomic way (see, for example, Haldane et al (2004)).

[19] See also Mussa (2003) on this point. Ideally, this issue of the number of policy instruments and goals (the assignment problem) would call for a unique instrument for each goal. In practice, this ideal might not be achieved. Even in the case where a central bank may have additional instruments in its policy bag (such as policy rates, quantitative measures such as lender of last resort or lender of collateral, and moral suasion), these instruments might prove to be too blunt to address the policy concern in a precise manner. See Fisher and Gai (2005) for a discussion of a range of financial stability instruments that may either support or complicate the ability of central banks to pursue monetary stability. In the situation where other authorities are unwilling or unable to respond with the most appropriate policy instruments, a central bank might be the only feasible option given the constraints on others.

[20] It is important to note that the inclusion of the variance of interest rate changes in conventional specifications of central bank preferences can also reflect concerns about the impact of policy rate volatility on financial markets. In this sense, financial stability issues of this type are already incorporated in standard monetary policy models.

arise from tail risk, ie low probability but high impact outcomes. Tail risks do not fit well into the benchmark model, and the implications are discussed in greater detail below.

Central banks going it alone

The model above might be interpreted as suggesting that central banks "go it alone" in dealing with financial stability issues. Such an interpretation would not be completely off the mark. There is a sense in which government authorities other than central banks are not fully addressing the financial stability issues. In such a vacuum, central banks may find themselves obliged to help.

This might motivate an extension to the preferences in (10). Rather than always weighing the implications of financial stability in terms of variances of output, inflation and interest rates in policy decisions at all times, it might be more appropriate to model central bank behaviour in a particular state-dependent way. During normal times, central banks would largely rely on other government authorities to attend to financial stability issues. Regulators and prudential authorities would address soundness and safety concerns in the bank and non-bank financial sector, and central banks would focus on price stability. However, during periods of imminent or actual financial instabilities, central banks would place weight on financial stabilities and hence adopt different preferences. This might also represent the outcome of a more complex game-theoretic approximation of stable underlying preferences that are mapped to a reduced form representation in the variances of macroeconomic variables. These "state-dependent" preferences might be appropriately modelled in the following way:

$$\begin{aligned} L &= L_{MS} + I(s_t)L_{FS} \\ &= (1 + I(s_t)\mu_y^{FS})\,\mathrm{var}(y) + (\mu_\pi^{MS} + I(s_t)\mu_\pi^{FS})\,\mathrm{var}(\pi) + (\mu_r^{MS} + I(s_t)\mu_r^{FS})\,\mathrm{var}(r - r_{-1}) \end{aligned} \tag{11}$$

where $I(s_t) = \begin{cases} 0, \text{ if normal times} \\ 1, \text{ if imminent financial instabilities} \end{cases}$.

The implications for policy responses flow directly from equation (11). In normal times when financial instabilities are minimal or when other government authorities are adequately attending to the concerns, the central bank would respond in a way consistent with the models in section 2. Otherwise, the central bank would alter its reaction function (ie the weights in the Taylor-type rule) in the manner suggested by equation (10).

Beyond the specification of the weights in the Taylor-type rules, the state-dependent preferences raise some important policy considerations about the appropriate role of central banks. On the one hand, some would probably raise objections to central banks diverting their eyes from the main goal of price stability. Such actions could adversely affect credibility and all that that entails. On the other hand, as the current market turmoil has illustrated, central banks might, at times, be the only institutions with the resources and ability to move flexibly enough in an emergency.

For instance, the recent policy response to financial troubles at Bear Sterns and the setting up of the Primary Dealer Credit Facility at the Federal Reserve Bank of New York required a nimble institution with considerable credibility. The actions appeared to boost confidence that financial markets were fundamentally sound. The aggressive cut in US policy rates, especially in contrast to the actions of other central banks, also appears to be part of the Federal Reserve's approach to the current situation. Despite putative success so far, questions remain. Could other bodies have dealt with the concerns? What would have been the risks? What risks has the Federal Reserve taken both directly, in terms of the quasi-fiscal action of writing a free option and indirectly, in terms of possibly distorting the incentives of market-based financial intermediation and the central bank's credibility as an inflation fighter?

All this leads to the point that central banks may find themselves in difficult situations where, as a representative of the government, they are the only feasible option, however

undesirable from the perspective of the mandate of price stability. The bigger question is not whether or not to act in an emergency but whether, in a risk management approach to monetary policy, central banks should take such actions into account.

In terms of the trade-offs associated with using policy rates in "going it alone", the benchmark model can be informative. Underlying the law of motion of the asset price bubbles described in equation (4) is a set of relationships between the economic environment and the endogenous behaviour of the bubbles. For example, the transition probability of an asset price bubble, whether a housing price bubble or a stock market bubble, is modelled as having the following functional form in Filardo (2007):

$$P(\text{bubble at t} \mid \text{bubble at t-1}, y_{t-1}, r_{t-1}, \tau_{t-1}) = \frac{\exp(2.5+1.1y_{t-1}-0.4r_{t-1}-0.1\tau_{t-1})}{1+\exp(2.5+1.1y_{t-1}-0.4r_{t-1}-0.1\tau_{t-1})}. \quad (12)$$

This indicates that the probability of an asset price bubble at time *t* is a function of whether the economy was already in a bubble state at time *t-1*, as well as the state of the economy. If in an expansion, the probability of a bubble continuing is higher than in a recession and, if the central bank is easing monetary policy, the bubble is more likely to continue. To some extent, the bubble longevity variable, τ, can be interpreted as a measure of regulatory forbearance,[21] and it can provide a means with which to get a sense of the trade-offs that central banks face if other government bodies are reluctant or unable to respond to bubbly conditions. For example, if bank regulators failed to react to a lowering of mortgage lending standards to highly leveraged households, one could reasonably argue that excessive lending would boost the longevity of a housing bubble. In this framework, greater forbearance can be modelled as a larger (negative) impact coefficient on τ.[22]

Simulations of this possibility confirm one's intuition that the greater the forbearance by other government bodies, the greater the incentive for the central bank to step in and react more aggressively to bubbly asset prices. In a sense, as the liquidity in the proverbial punchbowl flows in faster, the central bank should work harder to siphon the excess liquidity by tightening monetary policy.

The transition probability for the bubble (equation (12)) in this benchmark model also captures endogenous feedback from economic and financial developments to the behaviour of the asset price bubble. Accordingly, actions by the central bank would affect the expected duration and size of bubbles, through the (lagged) impact of interest rates directly and on output (y_t) indirectly. In the case of higher policy interest rates, the expected duration of the bubble and the expected peak size would tend to decline. In the extended version of the model based on equation (9), the endogenous interactions of monetary policy actions and household debt (D_t) would also factor in. Higher interest rates would tend to impede the growth in debt due to exuberance and reinforce the downward pressure on the expected duration and peak size.[23]

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[21] Technically, it is a measure of duration dependence, ie the tendency that asset price bubbles can collapse eventually under their own weight.

[22] This interpretation of τ might be viewed as being too narrow. It can also be viewed as a measure of asset price momentum. It might be reasonable to assume that, from the perspective of the central bank, asset price bubbles tend to have a momentum that prevents "acceptable" movements in the policy rate to reverse their trajectory. This underlying momentum could be captured by constant term and τ. Intuitively, it provides a way to weaken the link between asset price dynamics and the actions of the monetary authority.

[23] For example, growing financial imbalances in the form of unsustainable debt levels, $\tilde{D}_{t-1}$, might be modelled as having a negative impact on the bubble's transition probability; greater debt imbalances raise the risk of an asset price bubble collapse in the sense that the financial imbalances are more likely to unwind under their

Given this linkage between monetary policy and bubbles, two types of policy strategies are suggested. The first are called *defensive strategies*. They are the ones aimed at pricking asset price bubbles as a means to cushion the economy from a larger and more painful correction in the future. In this model, significantly higher policy interest rates would tend to dash the irrational exuberance that was driving asset prices. In practice, higher interest rates directly drive up the discount on future payouts from assets and would lower the prospects for economic activity. Together, they would tend to reduce the incentives to borrow, raise the cost of existing debt servicing and, ultimately, take the wind out of the sails of asset prices. In this scenario, household debt might be a good indicator of the effectiveness of monetary policy.[24]

The model also suggests other, more controversial, strategies – the *opportunistic strategies*. Strictly speaking, such strategies suggest that central banks might want to foster favourable conditions for positive bubbles when the economy is weak and for negative bubbles when the economy is strong.[25] To many this may sound odd. But a more compelling interpretation is based on confidence building. To the extent that the economy is weak or suffering a crisis, the central bank might like to talk up the economy, ie cheerleading, in order to engender confidence. Conversely, if the economy is strong, the central bank might like to rein in the exuberance, perhaps by reiterating the downside risks to the forecast owing, for example, to overleveraging of household balance sheets and the possible non-linear and outsized reactions to a slowdown. Taking this perspective, opportunistic strategies do not seem to be wildly at odds with what central banks actually do.

Both types of strategies – defensive and opportunistic – are, in theory, suggested by the model. But their practical importance is likely to be greater when considering the nexus of financial and monetary stability. The additional concern about financial stability naturally provides greater ammunition for those advocating a more proactive approach to conditions characterised by bubbles rather than to macroeconomic stabilisation alone. This would apply to central bank efforts both during the build-up phase of the bubble and the collapse. In either case, though, central banks might find it very difficult to calibrate the policy responses with a sense of confidence.

Arguably, recent events underscore the possibility that central banks (and other government bodies) were behind the curve during the build-up phase of the financial vulnerabilities. And, by all accounts, central banks are now facing very serious financial sector problems that may spill over to the global economy. One silver lining to the current crisis is that the banking system was generally well capitalised going into the turmoil. If it had not been, the depth and duration of the crisis could have been much worse. Higher household debt levels, on the other hand, have been a contributing factor to the cause and the propagation of the shocks to the system. More research into the current situation to understand the various causes, consequences and implications for the future is called for.

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own weight. However, if $\tilde{D}_{t-1}$ primarily acts as a signal of underlying bubble conditions, then the modelling of the role of $\tilde{D}_{t-1}$ might be more complicated but nonetheless generate similar policy trade-offs. For example, the financial imbalances' influence might be best captured in the updating equations of a non-linear Kalman filtering algorithm of the type in time-varying Markov switching models. In either case, tighter monetary policy would tend to lower the probability of the continuation of a bubble.

[24] Some commentators argue that such defensive strategies are too risky, in part because of the difficulty in identifying bubbles. Another part of the argument appears to rest on the assumption that pricking bubbles is too hard to calibrate with any sense of confidence; there is a sense of resignation that markets are likely to be better at defusing bubbles than central banks. Both arguments are empirical in nature. The recent financial turmoil may be seen as undercutting the strength of both arguments.

[25] See also Blanchard (2000) on this point.

Dealing with high impact, low probability risks

As noted above, the mapping of financial stability concerns into variances of output, inflation and interest rates might not be a good characterisation of the policy environments that most concern central banks. Indeed, some have argued that financial instabilities are best thought of as low probability, high impact events that might justify time-varying policy rules.

Two different assumptions have been put forth in recent years to justify time-varying policy rules. The first models the central bank as having state-dependent preferences. The second models tail risk, which implies very non-linear central bank reactions during periods of relative turbulence compared with periods of relative quiescence.

A state-dependent preferences approach to financial stability concerns was proposed by Svensson (2003) and explored by Disyatat (2005). In their research, the state-dependence assumption serves largely as a linear approximation of stable but non-linear central bank preferences; this approximation simplifies the decision problem sufficiently to justify application of conventional model solution methods.

Alternatively, state dependence might be thought of as an intrinsic part of decision-making amongst authorities with policy tools that can influence the health of the financial system. This amendment to the benchmark monetary policy model reflects the fact that central banks, from time to time, will be expected to step in to help preserve the stability of the financial system or they may have to contribute to a financial sector cleanup. Given that these events are sufficiently rare, central banks can typically focus on conventional monetary stability issues with little prejudice towards financial stability most of the time. At other times, when financial instabilities arise, central banks may need to switch to alternative policy rules that better address the needs of the public welfare.

These considerations might suggest transforming standard central bank preferences by adding a more complicated state-dependent measure of financial imbalances. Following Disyatat (2005), we could rewrite equation (10):

$$L = \text{var}(y) + \mu_{\pi}\,\text{var}(\pi) + \mu_{r}\,\text{var}(r - r_{-1}) + \Gamma(\widetilde{D})^2, \text{ where } \Gamma = \begin{cases} = 0, if\ \widetilde{D} \le \overline{D} \\ > 0, otherwise \end{cases} \quad (13)$$

In this specification, more conventional preferences apply until debt, or leverage, conditions get sufficiently worrisome when a debt threshold is breached.

In general, the period-by-period optimal monetary policy rule implied by these preferences would be similar to that of the benchmark model in section 2. During periods of imminent financial instability, the policy rule would switch to one with more weight on measures of debt. It is important to note here that the mandate of price stability is not abandoned but rather weighed along with the competing goal of financial stability.

Three practical implications flow from this extension. First, inflation problems that might arise during a period of imminent financial crisis are likely to be dealt with less aggressively, and hence deviations of inflation from implicit or explicit targets are likely to be larger and to be brought back to target more slowly.

Second, these preferences also suggest that if financial stability concerns were being appropriately addressed by other government bodies, the central bank would generally keep a closer focus on price stability.

Third, at the tipping point for a switch between policy rules, policy interest rates could swing abruptly, in contrast to the general implications in more conventional models that central banks should react gradually to changing economic conditions.

While these three implications are hardly novel, the modelling exercise here illustrates that modelling options do exist to address this nexus of monetary and financial stability. More

research into understanding the factors driving financial instabilities can, in principle, help to illuminate some of the trade-offs that central banks face in practice.

One drawback of the state-dependent preferences approach implied by equation (13) is that it might not depart too far from the certainty-equivalence modelling world where expected values of the targeted variables are sufficient to characterise the policy reaction function. To be sure, central bank behaviour would be non-linear at the tipping point. But on either side of the tipping point, the reaction function would be linear in the measure of household debt. Another way to make this point is that, even though the preferences switch, the shocks in the other blocks of the model are normally distributed.

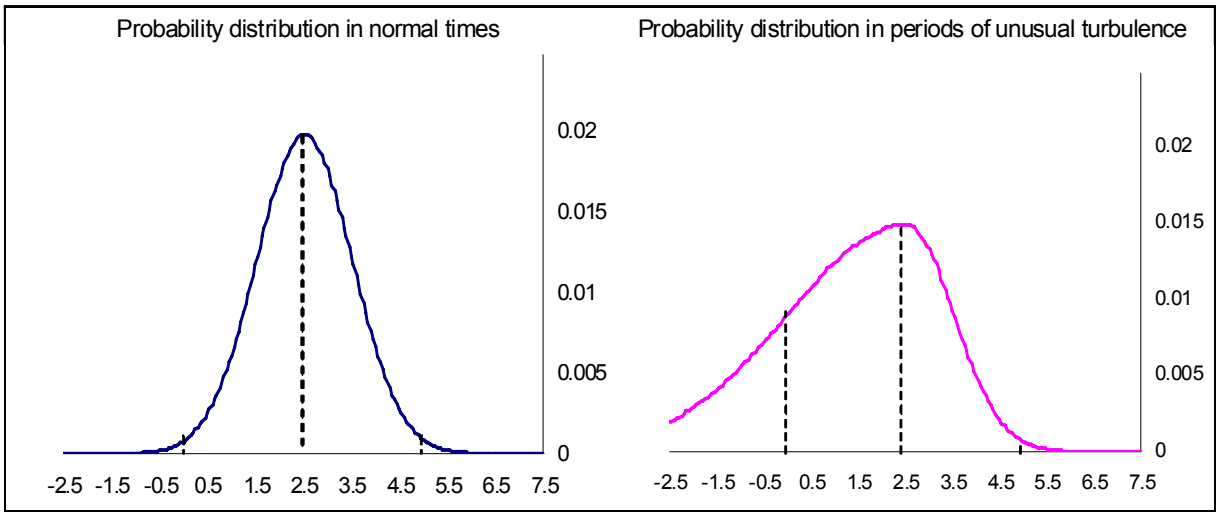
An alternative approach would be to emphasise the possibility that very non-linear monetary policy rules could arise from tail risks, ie non-normal shocks.[26] While a detailed discussion of the robust control in the presence of tail risk goes beyond the scope of this article, there are some conceptual issues worth mentioning. Three practical implications of tail risks for monetary policy were recently summarised by Mishkin (2008):

First, strong policy actions are called for. It is well known that additive uncertainty (eg assuming normally distributed errors) of the Brainard (1967) type calls for policy gradualism. Tail risks, however, call for more significant actions to insure against very bad outcomes. Arguably, such tail risks would rise with the level of household leverage. Second, central banks should move promptly as significant tail risks are realised. In the benchmark model case, by way of contrast, policy rules tend to suggest that central banks smooth policy responses over time. Third, policy actions should be decisive and the reasoning behind the actions should be transparent. In this case, actions are equivalent to taking out insurance against the low probability events (ie the tail risk events) that may have very dire consequences. It is important to make clear that the insurance motive arises from the tails of the distribution of likely outcomes rather than from a shift in the mode of the distribution (ie the most likely outcome). Graph 2 illustrates this difference.

Graph 2

An illustration of tail risk

Growth rate of economic activity, in percentage points



[26] See Cecchetti (2006) and Gochoco-Bautista (2008) on the empirical relevance of such concerns.

Conclusions

This article began with the observation that credit growth, especially to households, has been a defining feature of economic environments that appear to have been correlated with past and current financial turmoil, and ended with a discussion of how central banks might want to respond to low probability, high impact risks that can be associated with such developments. To be sure, current attempts to model such issues are a work in progress. And the current financial market turmoil illustrates just how hard it is to tailor responses to problems that arise in real-time and, in some sense, are difficult to solve because they often include new dimensions with no historical precedent.

This article highlights the fact that a rise in household debt, in and by itself, is not a sufficient reason to call for a monetary policy response. Rather, the impact on monetary policy decisions should depend on the particular role that household debt plays in an economy. The various extensions developed in the article underscore the possibility that an economy subject to significant liquidity constraints would call for a very different policy response from one where household debt played a role in boom-bust dynamics. Further complicating the policy trade-offs is the likelihood that most economies could be subject to both roles at the same time. Calibrating the policy implications in such a setting would require a clear understanding of the relative importance of the roles and the likely outcomes, including the possibility of significant tail risks arising from financial instabilities and, in the extreme, full-blown credit crunches.

More research is called for. First, and foremost, better measures of financial instability are needed. Empirical work to date has provided some leads worth pursuing. At the aggregate level, credit aggregates stand out in this respect. Increasingly, though, more efforts to bridge the gap between the detailed micro data and aggregate measures of instability are needed. Given the various ways in which financial instability can arise, a suite of models is likely to be the way forward.[27] Naturally, different types of financial instability will probably call for different types of measures.

The more difficult angles to grapple with, however, are the interactions amongst the various players at the centre of financial instabilities. On the one hand, financial market participants are human and do not always act as the sophisticated mathematical financial models suggest. In extreme conditions, participants may simply stop trading in the face of Knightian risks. The recent turmoil has illustrated just how serious a risk this is. In such circumstances, it may be difficult to know, with even a moderate degree of confidence, the combination of policy efforts that are necessary to restore confidence and accelerate a return to normality.

On the other hand, the behaviour of government bodies also affects the options facing central banks. Forging common diagnoses, prescriptions and coordinated actions across regulatory, prudential, fiscal and monetary authorities appears to remain a significant challenge. Moreover, globalisation raises additional dimensions of interactions related to cross-border spillovers and policy jurisdictions.

Whether simple models can be written down to capture all these issues in an adequate and insightful way is an open question. In the meantime, though, central banks will nonetheless have to confront reality. In this sense, modest quantitative steps, while surely leaving much to be explained, might offer useful ways to think about the complex issues.

[27] A range of historical financial crises is studied in recent research by Reinhart and Rogoff (2008).

References

Akram, F and Ø Eitrheim (2006): "Flexible inflation targeting and financial stability: is it enough to stabilise inflation and output?", *Norges Bank Working Paper*, no 2006/7, July.

Allen, F and G Gale (1999): "Bubbles, crises, and policy", *Oxford Review of Economic Policy*, vol 15, no 3, pp 9–18.

Allen, F and G Gale (2007): "Understanding financial crises", Oxford: Oxford University Press.

Assenmacher-Wesche, K and S Gerlach (2008): "Ensuring financial stability: financial structures and the impact of monetary policy on asset prices", unpublished Institute for Monetary and Financial Stability working paper, January.

Bernanke, B and M Gertler (1999): "Monetary policy and asset price volatility", in *New challenges for monetary policy*, Jackson Hole Symposium, Federal Reserve Bank of Kansas City, Wyoming, 26–29 August.

——— (2001): "Should central banks respond to movements in asset prices?", *American Economic Review*, May.

Bernanke, B, M Gertler and S Gilchrist (1999): "The financial accelerator in a quantitative business cycle framework", in *The Handbook of Macroeconomics* (J Taylor and M Woodford, eds), North-Holland.

Blanchard, O (2000): "Bubbles, liquidity traps and monetary policy", *Japan's Financial Crisis* (A Posen and R Mikitani, eds), International Institute of Economics: Washington DC.

Borio, C and P Lowe (2004): "Securing sustainable price stability: should credit come back from the wilderness?", *BIS Working Papers*, no 157, July.

Borio, C and W White (2003): "Whither monetary and financial stability? The implications of evolving policy regimes", in *Monetary policy and uncertainty: adapting to a changing economy*, Jackson Hole Symposium, Federal Reserve Bank of Kansas City, Wyoming, 28–30 August.

Bordo, M and O Jeanne (2002): "Monetary policy and asset prices: does 'benign neglect' make sense?", *International Finance*, Summer.

Brainard, W (1967): "Uncertainty and the effectiveness of monetary policy", *American Economic Review*, May.

Cecchetti, S (2006): "Measuring the macroeconomic risks posed by asset price booms", *NBER Working Paper*, no 12542, September.

Cecchetti, S, H Genberg, J Lipsky and S Wadhwani (2000): "Asset prices and monetary policy", report prepared for a conference on Central banks and asset prices, organised by the International Centre for Monetary and Banking Studies, Geneva, May.

Cecchetti, S, H Genberg and S Wadhwani (2003): "Asset prices in a flexible inflation targeting framework", in *Asset Price Bubbles: the Implications for Monetary, Regulatory, and International Policies* (W Hunter, G Kaufman and M Pomerleano, eds), MIT Press: Cambridge.

Chow, G (1978): "Evaluation of macroeconomic policies by stochastic control techniques", *International Economic Review*, June.

Debelle, G (2004): "Household debt and the macroeconomy", *BIS Quarterly Review*, March.

Disyatat, P (2005): "Inflation targeting, asset prices and financial imbalances: conceptualizing the debate", *BIS Working Papers*, no 168, January.

Filardo, A (2007): "Asset price bubbles and monetary policy: a multivariate extension", unpublished BIS working paper, June.

Filardo, A and S Gordon (1999): "Business cycle turning points: two empirical business cycle model approaches", in *Nonlinear Time Series Analysis of Economic and Financial Data* (P Rothman, ed), Kluwer Academic Publishers: Boston.

Fisher, C and P Gai (2005): "Financial stability, monetary stability and public policy", *Bank of England Quarterly Bulletin*, Winter.

Gai, P, S Kapadia, S Millard and A Perez (2008): "Financial innovation, macroeconomic stability and systemic crises", *Economic Journal*, March.

Gertler, M (2003): "Commentary", in *Monetary policy and uncertainty: adapting to a changing economy*, Jackson Hole Symposium, Federal Reserve Bank of Kansas City, Wyoming, 28–30 August.

Gochoco-Bautista, M (2008): "Asset prices and monetary policy: booms and fat tails in East Asia", *BIS Working Papers*, January.

Goodhart, C and B Hofmann (2001): "Asset prices, financial conditions and the transmission of monetary policy", Federal Reserve Bank of San Francisco proceedings of a conference on Asset prices, exchange rates and monetary policy, February.

Goodhart, C and D Tsomocos (2007): "Financial stability: theory and applications", *Annals of Finance*, January.

Greenspan A (1999): "General discussion: monetary policy and asset price volatility", in *New challenges for monetary policy*, Jackson Hole Symposium, Federal Reserve Bank of Kansas City, Wyoming, 26–29 August.

Gruen, D, M Plumb and A Stone (2003): "How should monetary policy respond to asset price bubbles?", *Reserve Bank of Australia Conference Volume*.

Haldane, A, S Hall, V Saporta and M Tanaka (2004): "Financial stability and macroeconomic models", *Bank of England Financial Stability Review*, June.

Illing, M and Y Liu (2006): "Measuring financial stress in a developed country: an application to Canada", *Journal of Financial Stability*, October.

Kent, C and P Lowe (1997): "Asset-price bubbles and monetary policy", *Reserve Bank of Australia Working Paper*, December.

Mishkin, F (2008): "Monetary policy flexibility, risk management and financial disruptions", speech at the Federal Reserve Bank of New York, 11 January.

Mussa, M (2003): "Remarks on achieving monetary and financial stability" in *Monetary Stability, Financial Stability and the Business Cycle: Five Views*, *BIS Papers*, no 18, September.

Monacelli, T (2006): "New Keynesian models, durable goods and collateral constraints", unpublished Bocconi University working paper presented at the Deutsche Bundesbank–ZEW Mannheim conference on the Relation between monetary policy and financial markets, October.

Reinhart, C and K Rogoff (2008): "This time is different: a panoramic view of eight centuries of financial crises", unpublished Harvard University working paper, March.

Roubini, N (2006): "Why central banks should burst bubbles", unpublished New York University manuscript, January.

Rudebusch, G and L Svensson (1999): "Policy rules for inflation targeting", *Monetary Policy Rules* (J Taylor, ed), Chicago: University of Chicago Press.

Svensson, L (2003): “Monetary policy and real stabilization”, in *Rethinking stabilization policy*, Jackson Hole Symposium, Federal Reserve Bank of Kansas City, Wyoming, 29–31 August.

White, W (2006): “Is price stability enough?”, *BIS Working Papers*, no 205, April.

Development of consumer credit in China

Shen Bingxi and Yan Lijuan[1]

Summary

Consumer credit – particularly personal consumer loans such as home mortgages and loans financing purchases of automobiles and large durable goods – has developed at a very rapid pace in China over the past decade. With the deepening reform of the house market beginning in 1998, commercial banks began to extend mortgage loans to individuals seeking to buy their own homes. Mortgage loans are now among the best assets held by China's commercial banks. However, China's policymakers and regulators are still facing challenges, including a nascent economy-wide credit information system, financial institutions with varying risk management standards and, in recent years, surging house prices. Therefore, in the context of China's macroprudential policies, the Chinese regulatory authorities have adopted a series of mortgage-related policies and regulations to mitigate and control credit risks and facilitate the healthy development of housing finance, home ownership and housing markets.

Volume of consumer credit

China's consumer finance market is at an early stage of development. Consumer credit is the main financing channel for households. In 2007, total outstanding loans to households increased by RMB 1.2 trillion, representing a year-on-year increase of 30.4%. This represents an acceleration of 9.3 percentage points, or RMB 546.6 billion, from the lending pace of 2006. Consumer loans outstanding, of which 80% were housing loans, increased by RMB 868.6 billion during 2007, compared with 2006. Outstanding business-related loans to the household sector increased by RMB 311.1 billion over the levels at the end of 2006.[2]

With the rapid development of the Chinese economy and the deepening reform of the financial system since 1998, the household lending market, especially consumer loans, has grown sharply. By the end of 2007, outstanding consumer loans reached RMB 3.28 trillion, an increase of RMB 3.14 trillion over the level at the end of 1999, representing an average year-on-year growth rate of 48% over the period. Meanwhile, as corporate direct financing gained in importance and household incomes rose, consumer loans became an increasingly important asset class for commercial banks, resulting in significant changes in the asset structure of Chinese banks in recent years. The proportion of consumer loans outstanding in total RMB bank loans in China rose to 12.5% at the end of 2007, from 1.5% in 1999 (Graph 1).

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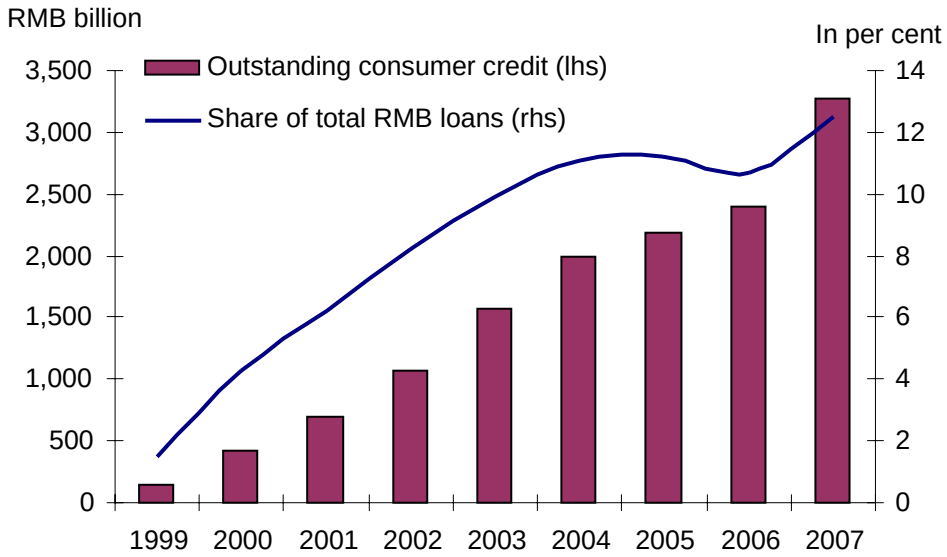
[1] The authors are staff of the Financial Market Department of the People's Bank of China (PBC). However, the views in this paper are those of the authors and do not necessarily represent those of the PBC.

[2] PBC, *China Quarterly Monetary Policy Report*, fourth quarter, 2007.

Graph 1

Consumer credit growth in China



Source: PBC.

RMB = renminbi.

Structure of consumer credit

The main lenders to consumers in China today are commercial banks and a number of auto financing corporations. However, mortgage loans still dominate consumer credit, even though auto loans, student loans and loans for the purchase of large durable goods have been growing rapidly in recent years. In order to promote the development of the household credit market, the PBC has put in place a series of credit policies. Documents such as "Management measures on individual housing loans" (1998), "Management measures on auto loans" (1998) and "Opinions on consumer credit development" (1999), among others, spell out the basic framework of supporting and regulatory measures adopted to facilitate the development of consumer finance.

Mortgage loans

China's outstanding residential mortgage loans increased 142 times from 1997 to 2007, or 64% a year, on average, to reach RMB 2.7 trillion at the end of 2007. By the end of 2007, mortgage loans accounted for 82.5% of total outstanding consumer loans. In 2007, the ratio of mortgage loans to GDP reached 10.9%, compared with only 0.2% in 1997. According to the mortgage survey of 20 big Chinese cities conducted by the PBC in 2007, the average size of a home mortgage loan is RMB 274,000, the average maturity is 15.6 years and the average down payment is 37.4%.

Besides commercial banks, another source of housing finance available to homebuyers in China is the Housing Provident Fund (HPF) system. Out of a pool of funds contributed by employers and their employees, an HPF provides long-term financing to employees of HPF members for the purchase, building, rebuilding and repair of owner-occupied houses or apartments. The typical structure of an HPF consists of the following five key elements: (1) the decision-making body is the HPF management committee; (2) the HPF management centre operates the fund and implements the decisions of the management committee;

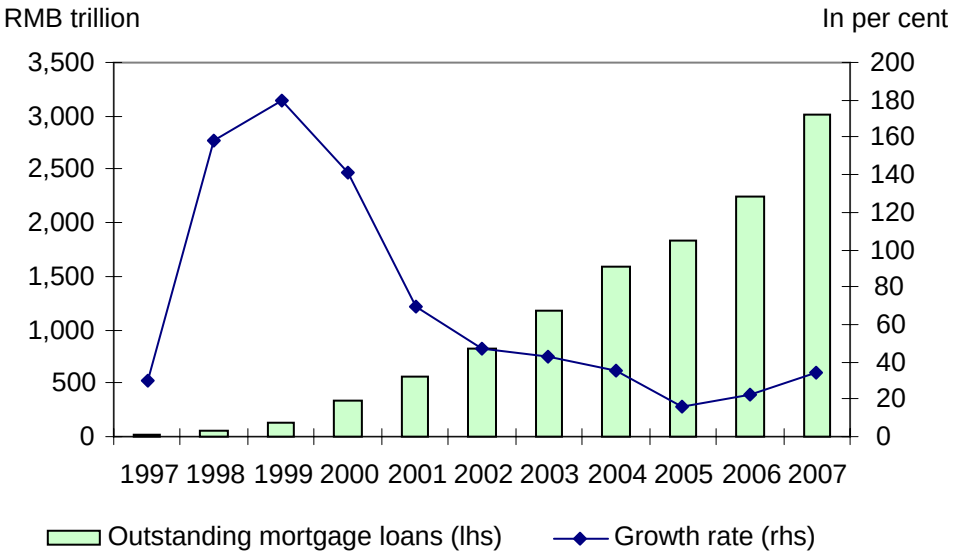
(3) a special account is set up at a commercial bank; (4) the HPF management centre extends consignment loans through commercial banks; and (5) the local fiscal authorities supervise the HPF. The interest rates on HPF deposits and loans are usually lower than benchmark commercial interest rates. They are proposed by the PBC and approved by the State Council upon collection of comments from the Ministry of Construction. All of the major cities, and other cities whose districts have their own HPFs, are required to set up HPF management committees and HPF management centres.[3]

Recently, HPF loans have grown rapidly. By the end of 2007, outstanding HPF loans reached RMB 472 billion, equal to about 17.5% of the outstanding stock of residential mortgages held by commercial banks, and representing year-on-year growth of 33.3%.

Today, state-owned commercial banks, joint stock commercial banks, local banks and foreign banks in China all provide mortgage loans to homebuyers. However, the four main state-owned banks (Industrial and Commercial Bank of China, Agriculture Bank of China, Bank of China and China Construction Bank) still account for about 68% of total mortgage lending by banks. Commercial banks provide 79.4% of total housing loans, while local HPF management centres provide 11.9%.[4]

Graph 2

Mortgage loan growth in China



Source: PBC.

RMB = renminbi.

Auto loans

In 1998, the PBC released "Management measures on auto loans" as a guideline for commercial banks. Auto loans grew quickly from 2001 to 2003. By the end of 2003, outstanding auto loans approached RMB 184 billion, more than three times the level at the end of 2001. However, the growth of auto loans slowed significantly beginning in 2004. In

[3] PBC, *China Real Estate Finance Report*, 2004 and 2007.

[4] PBC, "Mortgage survey of 20 big cities", 2007.

order to stimulate auto lending, the PBC and the China Banking Regulatory Commission (CBRC) adopted a series of measures to guide the auto loan operations of both commercial banks and auto financing companies. The result was a modest recovery and, by the end of 2007, the amount of outstanding auto loans reached RMB 110.7 billion. However, auto loans still account for only 3.4% of total consumer loans in China.

Student loans

With the government subsidising loans to certain groups of students, student loan products have become more diversified. There are three main types of student loans: (1) national, (2) local and (3) commercial. Only students from poor families who meet all of the specified conditions, including passing an income test, can apply for national and local student loans, both of which are subsidised. By the end of 2007, total outstanding student loans reached RMB 23.8 billion, 8.6 times as much as the total in 2001, but student loans still accounted for less than 1% of total consumer loans in China.

Other consumer loans

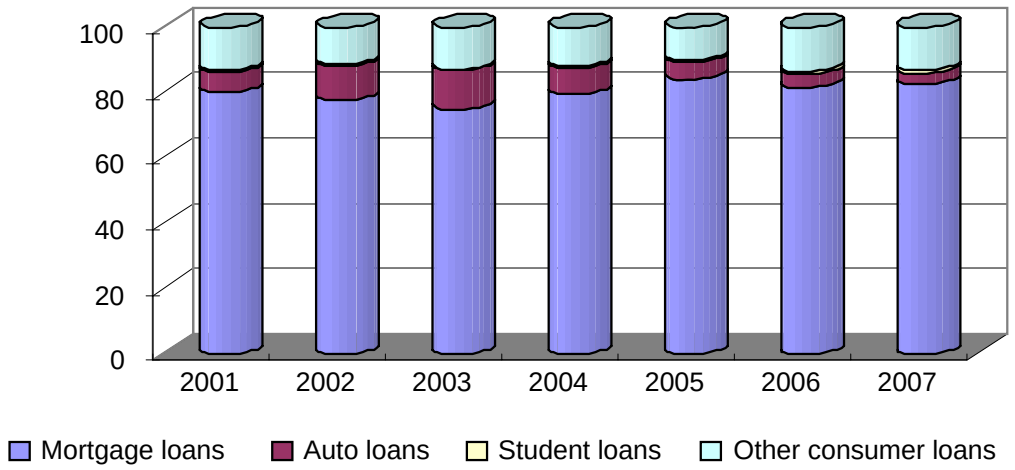
Besides mortgage loans, auto loans and student loans, other forms of consumer credit include loans for the purchase of large durable goods, home decoration and travel. These types of loans have also developed quickly, reaching RMB 440.7 billion by the end of 2007, or 13.4% of total consumer loans in China.

On the whole, the current structure of consumer loans in China is consistent with the country's level of economic development and credit culture.

Graph 3

Composition of household lending in China

As a percentage of total



Source: PBC.

Growth of housing loans

Main drivers of the growth in housing loans

One of the main drivers of the growth of housing loans in China has been the rapid development of the housing market since 1998. With the reforms of the housing market, the basic rules and frameworks for residential real estate taxes, land use and mortgage financing have been gradually taking shape. Between 2000 and 2007, housing investment in China grew by more than 20% every year, with funds coming from a wide range of investors.

Second, Chinese citizens' living standards have improved considerably over time. In 2006, average living space per person reached 27 square meters, compared with 6.7 square meters in 1978. Between 2003 and 2006, an average of 600 million square meters of new urban housing was completed annually.

Third, the house financing market itself has improved over the years. As discussed above, the PBC has issued a series of rules and regulations, such as "Management measures on individual housing loans" (1998), to encourage commercial banks to lend money to homebuyers. Under these rules, borrowers must purchase home insurance in order to protect the mortgage lender's interests in the event of damage to the mortgaged property.

Fourth, the HPF system, officially introduced in 1992, has also been steadily improving. As of the end of September 2007, the number of employees participating in the HPF system reached 100 million, deposits totalled more than RMB 1.5 trillion, in cumulative terms, and outstanding deposits exceeded RMB 900 billion. About 42 million employees improved their living standards through withdrawals from their own deposits at the HPF as well through loans extended by the HPF.

Fifth, a secondary market for residential mortgages has developed quickly since 2005. Policymakers have actively promoted asset-backed securitisation pilot projects. The development of securities backed by commercial mortgages is also under way, and such securities will be issued before long.

Main challenges in China's housing loan market

The recent acceleration of the growth of housing loans is one of the challenges facing the market for home mortgages. Between end-2006 and end-2007, outstanding housing loans increased by RMB 761.4 billion to reach RMB 3 trillion, which represents a year-on-year increase of 33.8% and an acceleration of 14.6 percentage points over 2006. Meanwhile, the amount of outstanding HPF loans also grew, by 33.3%.

A second challenge is the growing competitiveness of this market. Real estate loans, especially residential mortgages, are still the best and most important assets on the balance sheets of commercial banks. However, in order to increase market share, some commercial banks' branches may have loosened loan standards and shortened the loan investigation process. These activities may have undermined the safety of bank assets, especially mortgage loans.

Most recent policies

In August 2007, the State Council released a directive called "Opinions on dealing with the housing difficulties of low-income families". In accordance with the directive, related government ministries have proposed and implemented a series of measures designed to increase the supply of affordable housing and low-cost rentals. As a result, the housing supply structure is beginning to improve. This important directive also requires further measures aimed at discouraging excess speculation in the housing market.

In September 2007, the PBC and CBRC jointly issued the "Notice on strengthening management of commercial real estate credit", which modifies some of the regulations governing individual housing loans. According to the Notice, commercial banks may not extend new or additional mortgage loans or facilities on the basis of a reappraisal of a mortgaged property before the original mortgage is completely paid off.

As for those borrowers applying for second mortgages, down payments must be above 40% of the appraised value of the property, compared with 20–30% in the case of first mortgages, and the lending rate must be at least 1.1 times the benchmark lending rate for the same maturity. Both the down payment and the lending rate increase substantially as the size of the mortgage loan increases.

Upon receiving an application for an individual housing loan, commercial banks must check into the applicant's personal background and search the National Corporation and Individual Credit Information Database (see below) for records of past and existing housing loans.

In the fourth quarter of 2007, the increase in outstanding residential mortgage loans was only 60% of the increase in the previous quarter. However, it is too early to say whether this was due to the new policies.

Consumer financing products innovation

With the development of China's financial markets, product innovations are more frequent. Recently, commercial banks have promoted a large number of new products, including fixed-rate mortgages, grace period loans, relay mortgages and reverse mortgages, among others. These innovations have improved the efficiency of bank management and expanded the choices available to homeowners. In the secondary market, mortgage-backed securities (MBS) and securities backed by auto loans have also developed very quickly. By the end of 2007, RMB 7.18 billion worth of MBS, and RMB 1.99 billion worth of securities backed by auto loans, had been issued.

At the same time, the payment habits of consumers and the ideas of bank management have changed. Credit card operations have become the main channel through which commercial banks lend small amounts to consumers. By the end of 2006, a total of about 49.59 million credit cards had been issued.

Trends in the development of consumer loans

On the whole, China's consumer loans growth has accelerated, mainly because of the following factors.

First, in the past five years the Chinese economy has developed quickly and grown at a robust rate. From 2003 to 2007, GDP grew, on average, by about 10.6% annually on a year-on-year basis, while household incomes rose sharply. Between 2003 and end-2007, the average disposable income of Chinese citizens living in urban areas increased by RMB 5,314 to RMB 13,800, or 62.7%. The growth in disposable income spurred the development of consumer loans.

Second, the social security system, which includes the pension system, the public health system as well as low-income and disability support system, developed further, stimulating consumer demand. Since 2001, the total assets of the social security fund have expanded significantly, reaching $70 billion by the end of 2007, an increase of more than 600%.

Third, the credit environment improved gradually with the development of with the development of market infrastructure. The PBC began developing the National Corporation and Individual Credit Information Database in 2003. By the end of 2007, the number of corporations in the database reached 6 million, and the number of individuals was over 600 million, allowing commercial banks to price loans appropriately, based on a borrower's credit record, so as to meet different consumers' financing needs.

Risk profile of households and the impact on financial stability

Wimboh Santoso and Made Sukada[1]

Introduction

The household sector has the power to influence the overall economy, in part because of its size and its significant exposure to the financial sector. It also plays an important role in monetary and financial stability as the behaviour of households with respect to resource allocation – including their saving and spending decisions – affects market prices. Moreover, in line with the development of new financial products and the evolution of risk management in financial institutions, there has been a tendency to shift risks to households. Therefore, there is a growing need for specific attention to be paid to the household sector's risk profile, which has become an important input into monetary and financial policymaking.

This paper is organized as follows. The Introduction provides the motivation for the paper. The second section outlines the reasons why the household sector is important for monetary and financial stability and why we use the balance sheet approach in analysing the risk profile of households as related to financial stability. The third section discusses the preliminary findings of a survey of household balance sheets carried out by Bank Indonesia (BI) in 2007. The fourth section discusses the characteristics and the composition of Indonesian household debt and its impact on monetary and financial stability. The last section discusses the issues identified in the analysis and the policies that can address them.

Households and monetary and financial stability

The household sector, like the corporate sector, is part of the real sector in the economy, in which it plays an important role for many reasons. Household debt has increased at a rapid pace over the past few decades, raising concerns over its sustainability and, therefore, its consequences for the financial system and the macroeconomy as a whole (Debelle (2004)). The increase in the level of household debt may have been encouraged by macroeconomic stability, financial product innovations and legal or institutional regulations, while market imperfections, together with the effect of moral hazard on the behaviour of some lenders, may have boosted household debt to excessive levels, resulting in the growth of non-performing loans (Rinaldi and Sanchis-Arellano (2006)).

The household sector acts not only as a surplus sector but also as a deficit sector. As a surplus sector, households may allocate their funds – generated from incomes, wages and other sources – to financial assets such as bank deposits, shares and other securities, or to non-financial assets such as houses, land and other fixed assets. As a deficit sector, households receive funds from financial and non-financial institutions to finance consumption and investment or saving.

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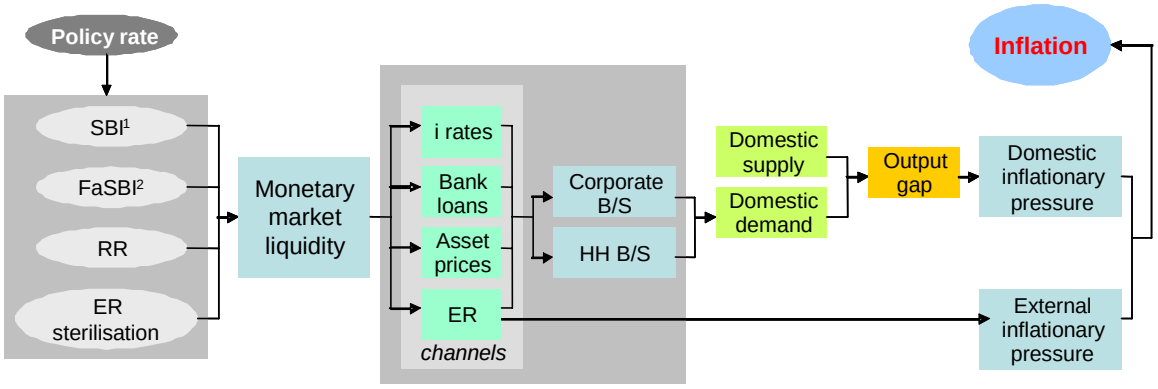
As both a surplus and a deficit sector, households are affected by and, in turn, affect monetary policy through different transmission channels (see Figure 1):

- *The interest rate channel.* When the central bank lowers interest rates, households may shift their portfolio investments into non-interest bearing assets and have an incentive to increase consumption and borrowing. This, in turn, generates demand, thereby stimulating supply. As a result, the production sector will need more financing.
- *The credit channel.* Households may cut their expenditures when banks raise the interest rates on loans (bank lending channel) in response to tighter monetary policy. Higher interest rates reduce households' access to bank lending, creating a credit crunch.
- *The exchange rate channel.* In an open economy with a non-fixed exchange rate regime, expansionary monetary policy affects exchange rates since lower interest rates make deposits denominated in domestic currency less attractive. Depreciation makes domestic goods cheaper than imported goods and stimulates domestic demand, which in turn leads to an increase in aggregate output. However, deep local currency depreciation sharply increases the debt burden of companies whose borrowings are denominated in foreign currency, affecting these companies' ability to expand, or even forcing them to scale back their operations. This situation affects incomes and wages, dampening domestic demand for goods and services.
- *The wealth channel.* A rise in the prices of assets (both financial assets, such as equities, and real estate) improves household and corporate balance sheets. As their net worth rises, both households and firms have more collateral to borrow against to finance consumption (households), investment (households and firms) and operational expansion (firms). Strong corporate growth also benefits households, who will likely see an improvement in their incomes or wages.

Figure 1

Households and monetary policy



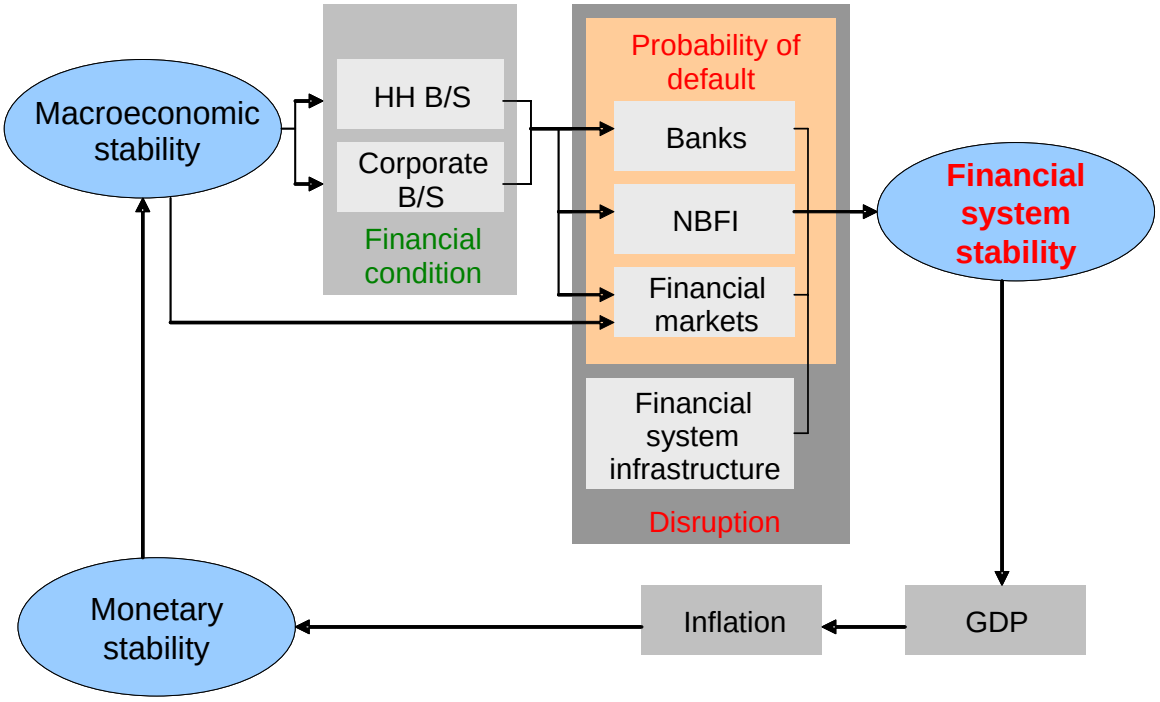
[1] BI Certificate. [2] Fine tune interest rate instrument.

Households also play an important role in financial stability (see Figure 2). Traditionally, systemically important financial institutions – big banks in particular – have been the focus of financial stability assessments since they have borne and managed most of the risks in the financial system. However, with the financial institutions' development of sophisticated risk management techniques and innovative and increasingly complex financial products in recent decades, some types of risk have been shifted to households. Development of risk management techniques and financial products is in line with the stricter policies and

standards imposed on financial institutions by regulators in response to the development of financial market infrastructure (IMF (2005)).

Figure 2

Households and financial stability



Financial stability assessments should therefore begin focusing on households. Even though, in the current conjuncture, households seem to have enough of a financial cushion to face shocks, there is no guarantee that conditions will not be different in the future when households may face larger shocks, such as changes in interest rates, income or employment status (Benito et al (2007)).

There are various channels through which risks flow to and from households as the ultimate bearers of financial risks in the system (IMF (2005)). Households are exposed to risks in their capacity as depositors, insurance beneficiaries, equity investors and bondholders. And households are also a source of financial risks in their capacity as borrowers from financial institutions. These risks are of various types, including market risks, inflation risks, investment planning and reinvestment risks and longevity risks. Consequently, the potential costs to the public sector would be enormous should households fall short in their different capacities, especially where the government is the insurer of last resort.

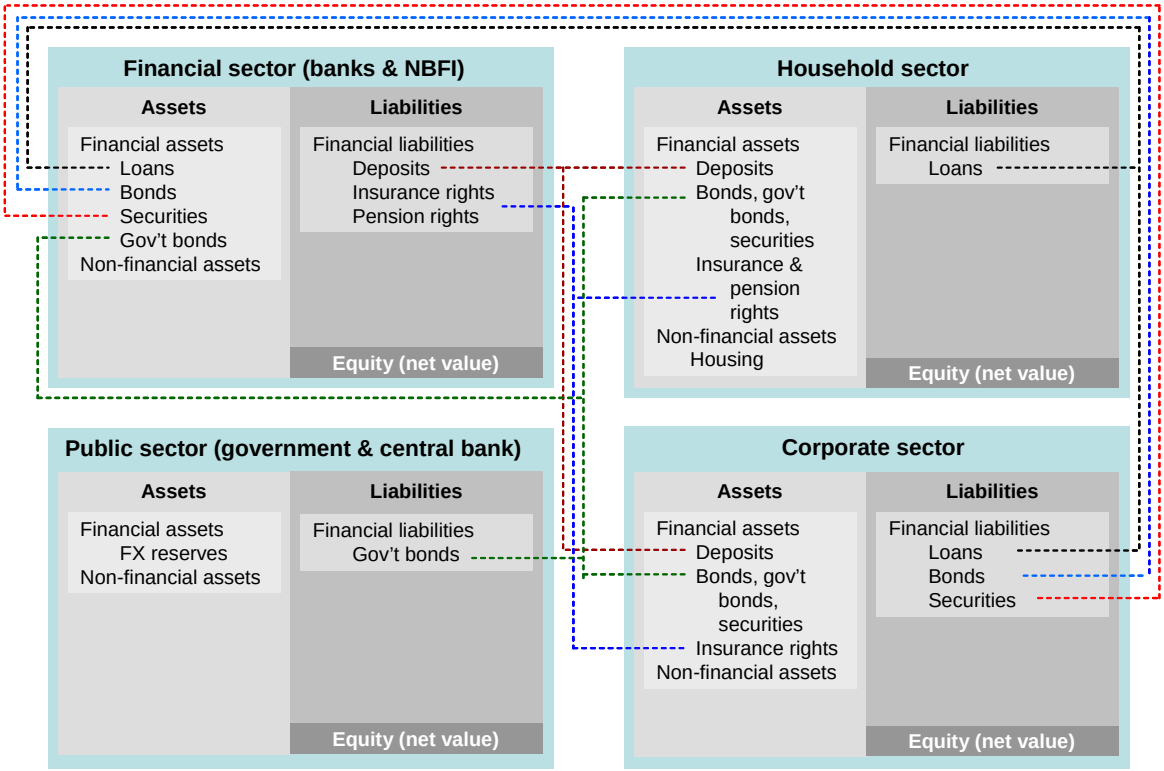
It is therefore necessary to assess the exposure of households to all sectors of the economy. The productivity, risk exposure and financial condition of households can be measured more accurately if seen in the form of a balance sheet, income statement and statement of cash flow (Samphantharak and Townsend (2006)). Figure 3 shows the household sector's balance sheet and its relationships with the balance sheets of the corporate, public and financial sectors.

The balance sheet approach to the surveillance of financial system stability examines the positions (or stock variables) of sectoral and aggregate assets and liabilities in measuring and analysing risks in a country's economy (Haim and Levy (2007); Allen et al (2002)). The national balance sheet accounts, which consist of the balance sheets of the financial sector (banks, institutional investors and others), the private sector (the business and household

sectors) and the public sector (the government and central bank), constitute the main tool in this approach. Since it is based on the assets and liabilities held by each sector, this approach enables us to look at economic activities in order to see the financial risks to which each sector is exposed and the relationships between sectors that could intensify any shocks and cause a crisis. With financial globalisation, the balance sheet approach has become more important. More frequent crises have led to the deterioration of the balance sheets of all sectors, since problems in one sector's balance sheet have spilled over to other sectors' balance sheets (Kohsaka and Enya (2006)).

Figure 3

Household and sectoral balance sheets



Sources: Allen et al (2002); authors.

In establishing an analytical framework for assessing a threat to financial stability, one may focus on four types of balance sheet mismatches that can help us determine a country's ability to service debt when it is faced with a shock (Allen et al (2002)):

- Maturity mismatches, where the liabilities due in the short term cannot be covered by liquid assets so that (1) a sector is unable to cover its contractual commitments, especially when it cannot roll over its debt, or (2) a sector is exposed to the risk of rising interest rates;
- Currency mismatches, which may expose a sector to foreign exchange rate risk that may lead to a capital loss;
- Capital structure problems, where a sector relies heavily on debt rather than on equity in its financing, to the point that it is vulnerable to a cash flow shock; and
- Solvency problems, where a sector's total assets (including the present value of future cash inflows) are inadequate to cover its liabilities (including contingent liabilities).

This paper focuses on maturity mismatches and solvency problems, the two types of mismatches that are relevant to households.

Household sector balance sheet in Indonesia

Understanding the importance of monitoring the household sector in Indonesia, BI has applied the balance sheet approach framework to this sector. However, in contrast with the financial and corporate sectors, the availability of data on Indonesia's household sector is limited, hampering attempts to construct a balance sheet. Hence, as a first step, BI conducted a household survey at the end of 2007 in six regions around the country.

We recognise that the data gathered from those six regions (individually and/or as a group) are too limited to give us a representative picture of the risks posed by the household sector to the financial system and of the financial risks to which the household sector is exposed. However, this initial survey paves the way for a national household survey in the near future. Given the limited availability of time series data, we found that household balance sheets can be used in a preliminary analysis of the risk profile of Indonesian households.

Concepts and methodologies

The six regions covered in the survey are Daerah Istimewa Yogyakarta (DIY), Jawa Timur (Jatim), Bogor-Depok-Tangerang-Bekasi (BoDeTaBek), Jawa Barat (Jabar), Jawa Tengah (Jateng) and Sumatera Barat (Sumbar). These particular regions were selected because of their unique and distinctive social, economic and cultural characteristics. In constructing the survey, we relied on definitions commonly used in other countries (eg Australia, the Netherlands, Singapore and the United Kingdom) in order to obtain results that can be compared across countries. However, there are still some potential comparability problems, since not all definitions are applicable to each region.

The term "household" basically refers to individuals who live in or share the same dwelling. Another definition is as follows: "A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms or a single room that is occupied (or, if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together or any other group of related or unrelated persons who share living arrangements. (People not living in households are classified as living in group quarters.)"[2]

However, in this paper, we use the definition of household from Badan Pusat Statistik (National Statistics Agency of the Republic of Indonesia): "a person or a group of people living in physical/census building or part thereof who make common provision for food and other essentials of living".[3]

Since the survey was conducted for the purpose of monitoring financial stability, we construct the households' balance sheets in a way that enables us to assess the households' relationships with the financial sector. Hence, the balance sheets list assets, liabilities and net worth (see Table 1).

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[2] See US Census website, http://quickfacts.census.gov/qfd/meta/long_71061.htm.

[3] See Badan Pusat Statistik website, at www.bps.go.id/sector/socwel/index.html.

Table 1

Balance sheet of Indonesia's household sector

Assets	Liabilities
Financial assets	Bank loans
Cash	Loans from non-bank financial institutions
Bank deposits	Other loans
Insurance, cooperatives, post office deposits	
Accounts receivable	
Stock, bond, mutual fund investments	
Pension funds and other investments	
Non-financial assets	
Gold and jewellery	
Vehicles	
Houses and buildings	
Land	
	Net worth (assets minus liabilities)

In our analysis of maturity mismatches and solvency problems, we use the following ratios:

- The ratio of total liabilities to income, to show the extent to which household income covers household liabilities.
- The ratio of total bank liabilities to income, to show the extent to which household income covers the household's bank liabilities.
- The debt servicing ratio (the ratio of instalment and interest payments to income), to show the proportion of household income used to pay for goods purchased on an instalment plan and interest on loans.
- The gearing ratio:
  - The ratio of total liabilities to total assets, to show to what extent assets cover liabilities.
  - The ratio of total liabilities to current assets, to show the extent to which current assets cover liabilities.
  - The ratio of total liabilities to fixed assets, to show the extent to which fixed assets cover liabilities.
- Household net worth, which is calculated by subtracting liabilities from assets.

Indonesia's financial system and household sector

Since the Asian financial crisis in the late 1990s, Indonesia's financial system – particularly banks, insurance companies and capital markets – has been steadily strengthened, as demonstrated by the growth of asset value over the past few years (Graph 1). While Indonesia's capital markets (ie both equity and bond markets) have grown rapidly, Indonesia's financial system is still dominated by banks: the ratio of the banking sector's assets to GDP was around 51.4% at the end of 2006 (Graph 2). Given the key role the banking sector plays in Indonesia's financial system, this paper will focus on the risk profile of households with respect to this sector.

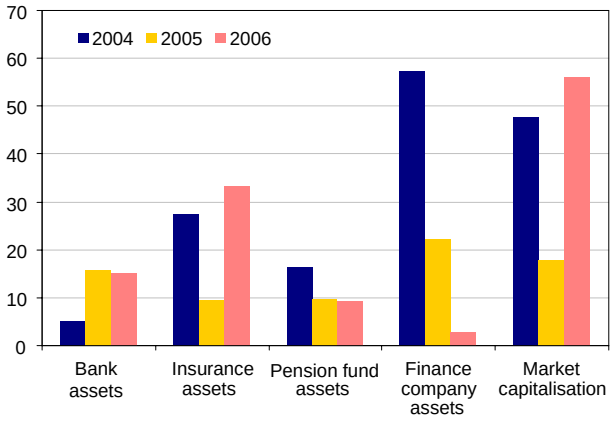
The household survey carried out by BI shows that, as in other developing countries, the majority of household assets in the six regions are non-financial assets, particularly housing, which accounts for around 79.7% of total household assets (Table 2 and Graph 3). However, one reason housing accounts for such a large share of household assets is the rise in housing prices over the past few years. This, in turn, suggests that Indonesian households are sensitive to housing price movements (Graph 4).

With regard to financial assets, households tend to put their funds in bank deposits instead of investing them in the bond or equity markets. On average, bank deposits account for over 40% of total household financial assets (Graph 5), suggesting that the majority of households in the six regions still do not have an adequate understanding of either banking or non-banking financial products. Banking deposit products, especially current and time deposits, are an exception.

Graph 1

Asset value

Year-end percentage change

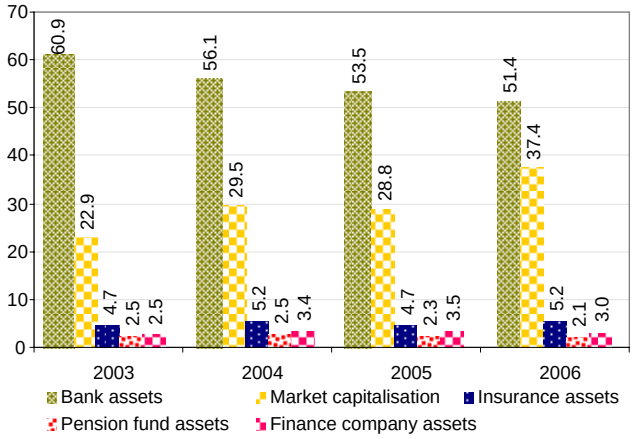


Source: Bapepam-LK.

Graph 2

Indonesia's financial system

In per cent of GDP



Source: Bapepam-LK.

Table 2

Household assets

As a percentage of total

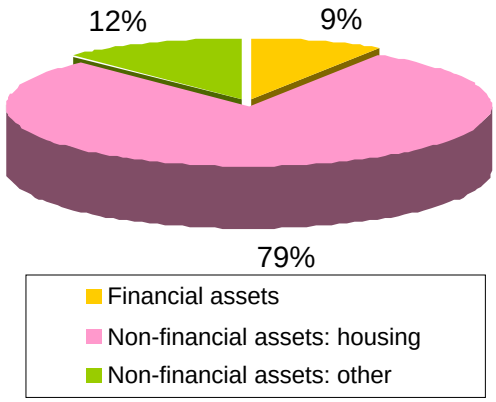
Assets	Region						Total six regions
	DIY	Jatim	BoDe-TaBek	Jabar	Jateng	Sumbar	
Financial assets	7.4	8.0	11.1	11.5	5.5	10.8	9.0
Non-financial assets							
Housing	79.7	80.7	73.7	77.4	84.6	76.8	78.9
Other	12.9	11.3	15.2	11.1	9.9	12.5	12.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: BI Survey.

Graph 3

Household assets

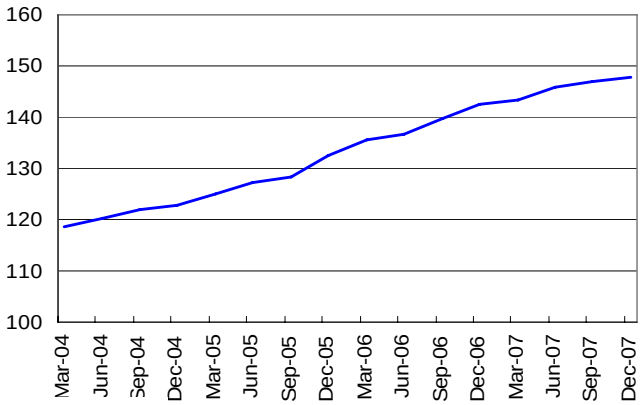
As a percentage of total assets



Source: BI Survey.

Graph 4

Residential property price index

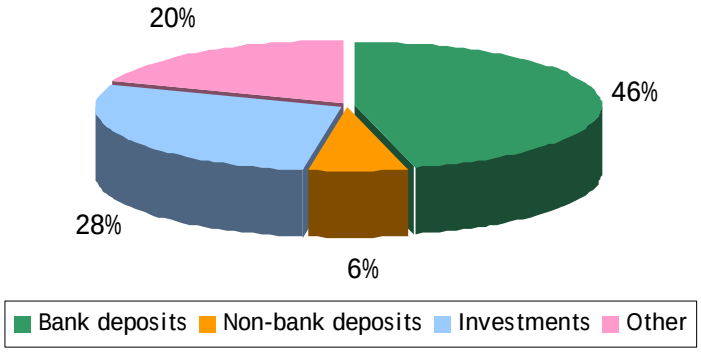


Source: BI.

Graph 5

Household financial assets

As a percentage of total financial assets



Source: BI Survey.

Furthermore, the majority of households have not yet been targeted by the marketing efforts of financial institutions, especially for non-banking deposit products. Consequently, households that are laymen when it comes to financial products still prefer to put some of their funds in bank deposits (Table 3), even though bank deposit rates tend to be declining. This may represent an opportunity loss for these households, but it also suggests that they have not been directly exposed to market risk.

Table 3

Household financial assets

As a percentage of total financial assets

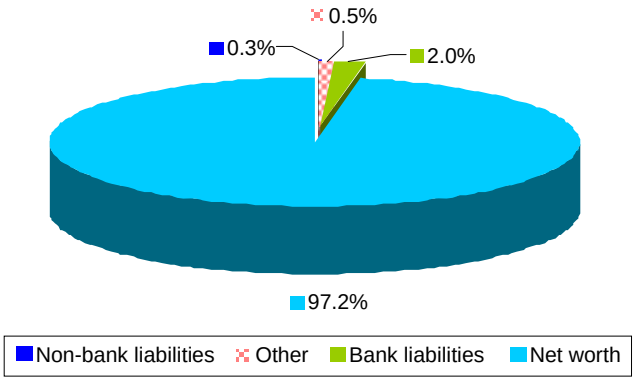
Assets	Region						Total six regions
	DIY	Jatim	BoDe-TaBek	Jabar	Jateng	Sumbar	
Financial assets							
Bank deposits	39.6	46.5	48.3	57.8	46.0	37.0	46.1
Non-bank deposits	7.5	4.9	2.8	5.6	13.6	7.4	6.5
Investments	29.9	26.3	28.9	27.2	12.3	34.5	27.9
Other	23.0	22.3	20.0	9.5	28.1	21.2	19.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: BI Survey.

Graph 6

Household funding

As a percentage of total assets

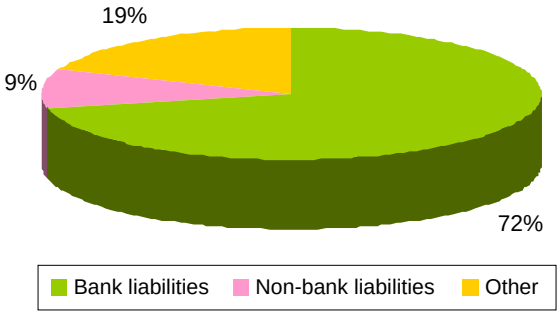


Source: BI Survey.

Graph 7

Household liabilities

As a percentage of total liabilities



Source: BI Survey.

Table 4

Household funding

As a percentage of total assets

Funding	Region						Total six regions
	DIY	Jatim	BoDe-TaBek	Jabar	Jateng	Sumbar	
Bank liabilities	3.0	1.5	1.9	2.3	1.5	1.3	2.0
Non-bank liabilities	0.3	0.2	0.7	0.1	0.2	0.3	0.3
Other	0.4	0.5	1.6	0.4	0.3	0.2	0.5
Net worth	96.2	97.9	95.9	97.2	98.1	98.2	97.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: BI Survey.

Table 5

Household liabilities

As a percentage of total liabilities

Liabilities	Region						Total six regions
	DIY	Jatim	BoDe-TaBek	Jabar	Jateng	Sumbar	
Bank liabilities	80.9	69.4	45.3	82.3	76.7	73.7	71.4
Non-bank liabilities	8.6	8.2	15.9	2.5	8.6	13.9	9.5
Other	10.5	22.4	38.8	15.2	14.7	12.4	19.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: BI Survey.

On the financing side, although the majority of households have had little exposure to financial products, including banking products, the survey found that bank loans were the preferred source of external funding. Households finance their assets externally through funding sources such as bank, non-bank and other liabilities and internally by drawing on their net worth (accumulation of personal income). On average, households tend to rely heavily on net worth for financing their assets – this is how more than 90% of total assets are financed (Graph 6 and Table 4) – followed by bank liabilities (around 2%), other sources and non-bank liabilities, in that order. And most household debt is in the form of bank loans, although households can turn to other financing sources, such as pawnshops. The ratio of bank liabilities to total liabilities was more than 70% (Graph 7 and Table 5).

Table 6

Liquidity mismatch ratios

In per cent

Regions	Total liabilities income		Bank liabilities income		Instalment + interest payment income	
	Total[1]	Bank[2]	Total[1]	Bank[2]	Total[1]	Bank[2]
DIY	31.5	45.2	25.4	37.8	12.6	16.7
Jatim	15.8	26.8	11.1	20.1	13.0	20.1
BoDeTaBek	24.8	26.5	10.6	11.3	6.3	15.1
Jabar	na	na	15.3	40.0	4.8	14.0
Jateng	14.9	57.0	11.5	49.2	11.1	18.4
Sumbar	9.7	7.8	7.2	8.4	5.5	7.8

[1] The ratio is calculated using data from all respondents. [2] The ratio is calculated using data from respondents that had bank liabilities.

Source: BI survey.

To analyse the quality of household exposure to the financial sector, we look at several ratios that could indicate whether Indonesian households have problems with maturity mismatches and solvency. Maturity mismatches would be indicated by the ratios of total household liabilities and households' bank liabilities to income. According to the household survey, these ratios are around 7% and 40%, respectively, in the six regions, which is relatively low by international standards. The comparable total liabilities to income ratio in Australia, for example, was around 160% in early 2007 (Ryan and Thompson (2007)). The debt servicing ratio of households – the ratio of instalment and interest payments to income – is dropping in line with trend declines in domestic interest rates. Total household instalment and interest costs are now at most 20% of income. These low ratios show that Indonesian households will be able to cover their liabilities when these mature (Tables 6 and 7).

Table 7

Solvency ratios

In per cent

Regions	Total liabilities					
	Total assets		Current assets		Fixed assets	
	Total[1]	Bank[2]	Total[1]	Bank[2]	Total[1]	Bank[2]
DIY	3.8	5.9	71.5	116.2	4.1	6.4
Jatim	2.1	3.3	32.5	54.5	2.3	3.6
BoDeTaBek	6.1	6.5	76.6	60.6	6.9	5.4
Jabar	2.8	14.9	na	na	na	na
Jateng	1.9	9.2	32.2	135.0	2.0	9.8
Sumbar	1.8	3.2	17.9	52.0	2.0	3.5

[1] The ratio is calculated using data from all respondents. [2] The ratio is calculated using data from respondents that had bank liabilities.

Source: BI survey.

Moreover, the household gearing ratio – the ratio of household liabilities to total assets – is less than 1 (100%), suggesting that if household income does not cover liabilities, the value of household assets is great enough to cover them. The minimum household gearing ratio also shows that the net worth of households is high enough to become an important source of funds.

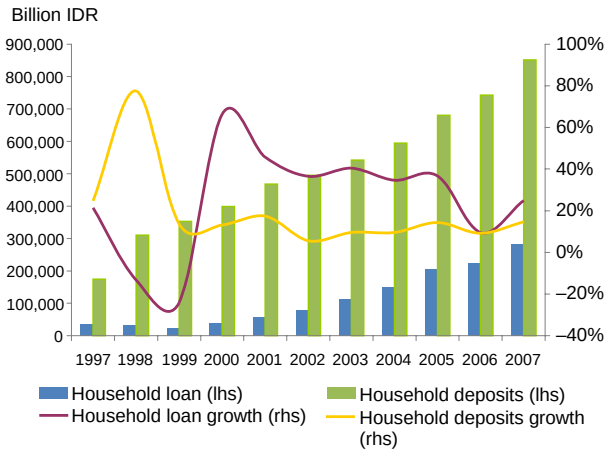
Household debt in Indonesia

As discussed in the previous section, households in Indonesia have relatively limited exposure to financial assets and are less reliant on external sources of financing than households in other countries such as Australia. The involvement of households in the financial sector tends to be mostly with the banking sector; they own few non-bank financial assets and seek little consumer financing from non-bank financial institutions, although this is increasing. Nonetheless, the rapid development of financial sector services amidst favourable economic conditions in the post-crisis period has increased the degree of

monetisation in the country as well as household interaction with financial institutions, particularly banks.

Graph 8

Growth of household deposits and loans

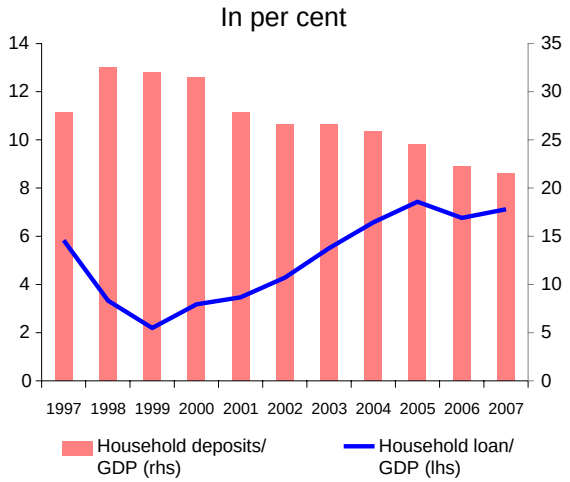


IDR = Indonesian rupiahs.

Source: BI.

Graph 9

Ratio of household savings and loans to GDP

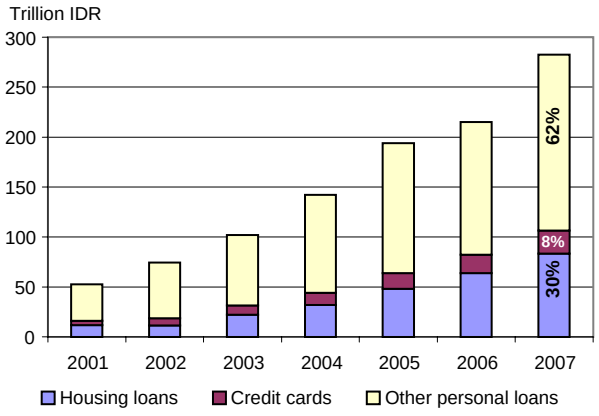


Source: BI.

Graph 10

Household debt

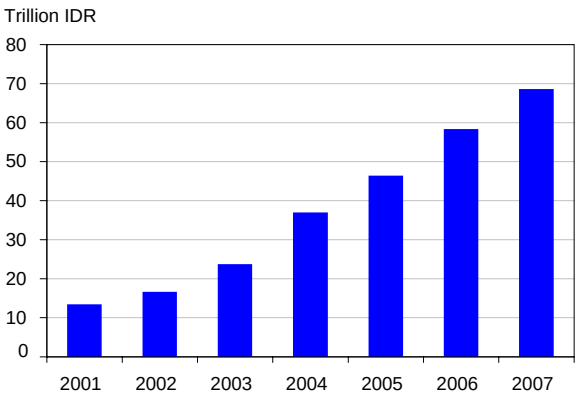
Bank consumer loans



Source: BI.

Graph 11

Consumer financing from non-bank institutions



Source: BI.

Households have become a net surplus unit for banking as the level of household savings significantly exceeds loans. So far, individual bank deposits[4] account for about 60% of total bank deposits. However, as depicted in Graph 8, since 2000 household loans have grown rapidly at an average rate of 36% annually, while savings have grown steadily at an average

[4] Individual bank deposits consist of current account deposits, demand deposits, savings and time deposits.

of 12% annually. Consequently, the share of household debt[5] in total bank lending increased substantially, from 15% in 2000 to 28% in 2007; as a percentage of GDP, household debt more than doubled (Graph 9). Innovation in consumer finance products, including the promotion of such products, has been a major contributing factor in the growth of household debt, since it has resulted in relaxed borrowing constraints, giving households more access to credit.

Looking at the composition of household debt from the banking sector, in 2007 housing loans accounted for around 30% of total household loans, while credit cards and other personal loans accounted for 8% and 62%, respectively. Meanwhile, consumer financing from non-bank financial institutions has also grown rapidly in recent years, especially auto loans and loans for other consumer products.

Housing loans

Housing loans grew rapidly during 2001–07, by 41% a year, on average, compared with personal loans, which grew by 31% a year. On the demand side, this is likely to have been driven by the post-crisis economic recovery, which led to increased household incomes and greater capacity to borrow. Interest rates have had a significant negative impact on demand for mortgages for large homes, but not for small homes. On the supply side, banks created innovative products that have improved households' access to loans for houses and apartments – for example, low or even zero down payments, a higher loan-to-value ratio (LVR), additional loan facilities for interior design and purchases of home furnishings, etc. Moreover, a change in banking regulation that reduced the risk weighting for residential mortgages in the loan loss provisioning ratio from 50% to 40% has also encouraged banks to increase the supply of credit for housing.

State-owned banks no longer dominate the housing loan market. Thanks to increased competition among banks and less specialisation, private banks account for an increasingly large share of outstanding housing loans. The market share of state-owned banks, particularly those whose business is focused on housing loans, dropped from around 60% in 2001 to 40% in 2007.

Personal loans

Credit card and other personal debt has also grown strongly, by an average annual rate of 31% during 2001–07. The credit card market used to be dominated by foreign and joint venture banks; however, in the past few years, state-owned and private domestic banks have become increasingly large players in this market. Aggressive sales promotion by issuer banks (for instance, less stringent application requirements, reward packages, zero percent instalment facility) has contributed to the rapid growth of credit card transactions.

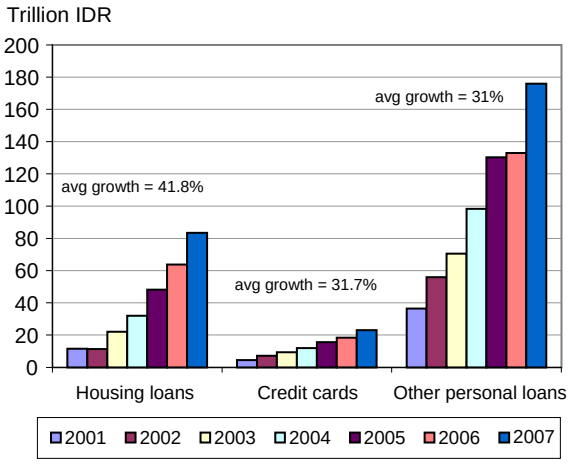
Other personal loans account for the majority of outstanding household debt, and auto loans account for the largest share in this group. Recent improved cooperation between banks and leasing companies has led to improvements in the way credit is granted for automotive vehicles, which has helped spur strong growth in auto credit outstanding. In addition to these innovations in the personal loans market, banks have also begun to offer unsecured personal loans, which generally have low outstanding but carry higher interest rates. This type of loan does not require as much detailed information from applicants as other loans.

[5] As we do not have enough information to distinguish between households and other entities in consumer credit, we define overall consumer credit as household debt.

The quality of household debt is much higher than that of other types of debt, as seen in the lower non-performing loan (NPL) ratio for household debt than for overall bank credit, 3% and 5%, respectively, at end-2007 (while the NPL ratio for investment loans and working capital loans is around 3% and 4%, respectively).

Graph 12

Household debt

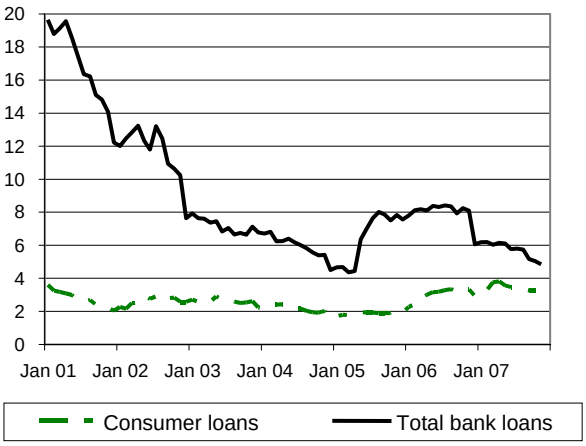


Source: BI.

Graph 13

Ratio of household savings

As a percentage of total loans



Source: BI.

Implications for monetary policy and financial stability

The growing share of household debt in total outstanding bank loans may raise concerns about the implications for monetary and financial stability should the economy undergo any changes or be exposed to a shock.

Home ownership can play a significant role in monetary policy transmission due to the wealth effect. The consumption effect of rising house prices is uncertain and subject to distributional effects, depending on who is getting the increased housing wealth (Mishkin (2007)). Given that housing wealth is spread more evenly across the population than wealth generated by financial assets such as stocks, and that housing prices are less volatile than stock prices, some economists argue that housing should have a larger wealth effect than stocks. However, the "bequest motive" may reduce the consumption effect of housing wealth – ie if homeowners plan to live in their houses until they die, bequeathing them to their children.

An analysis of the data indicates that this is the case in Indonesia. Even though housing is the largest asset owned by Indonesian households, most homeowners intend to leave their houses to their children rather than to reap the benefits of rising house prices. In addition, given Indonesia's less developed financial markets, products enabling homeowners to refinance or borrow against their homes (for example, through home equity loans) to increase consumption are limited. Thus, housing prices are not a significant channel for monetary transmission in Indonesia.

In contrast, interest rates and consumer bank lending are effective channels for monetary policy transmission with respect to inflation in Indonesia (Graphs 14 and 15). As shown in

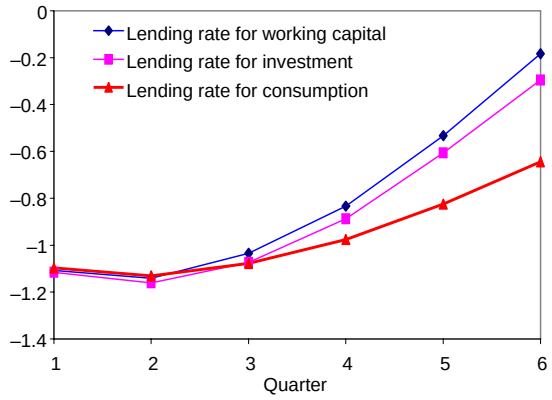
Graph 15, interest rates on consumer loans are more sensitive to policy rates than interest rates on business loans financing working capital and investment.[6]

The relatively low NPL ratio of household debt, combined with the higher interest rate spreads on consumer loans than on business loans, has induced banks to provide more consumer credit to households, utilising existing excess liquidity. Thus, the increasing demand for consumer credit should be supported by adequate supply (and capacity to supply) to dampen inflationary pressures. To address concerns about non-performing credit card debt, which is trending upwards, banks should also be more prudent in approving new credit cards, taking into account applicants' ability to repay.

All in all, since Indonesia's households have assets in excess of their liabilities and have relatively little exposure to financial assets, they pose little threat to the financial sector.

Graph 14

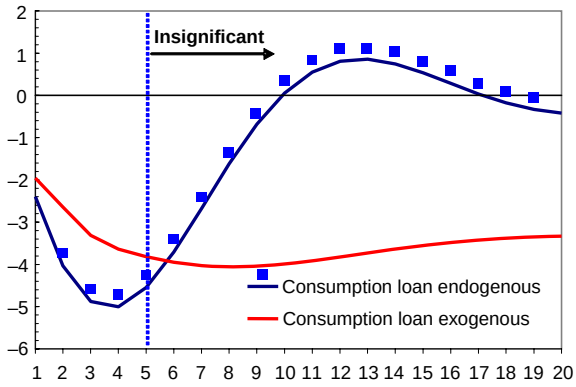
Cumulative response of inflation to SBI rate



Source: BI.

Graph 15

Cumulative response of inflation to changes in SBI rate through consumer credit[1]



[1] Graph 15 demonstrates the relative importance of consumer credit as a channel for monetary transmission using vector auto regression (VAR) methods, following Morsink and Bayoumi (2001). The strength of the channel is indicated by comparing two sets of impulse responses: the blue line shows the response of inflation to one standard deviation changes of SBI-one month through the channel of consumer lending, while the red line represents the response of inflation to one standard deviation changes of the BI rate while blocking any responses within the VAR that passed through the variable of consumer lending (consumer lending is treated as exogenous).

Source: BI.

[6] Interest rates on consumer loans are highly correlated with inflation rates (–0.24) compared with lending rates for working capital (–0.21) and investment (–0.17).

Conclusions

From a financial stability perspective, Indonesian households pose a minimal threat to the financial sector. As indicated by their net worth, the value of their assets is much higher than the value of their liabilities. Indonesian households' high net worth and the large share of fixed assets (as opposed to financial assets) in total household assets suggest that there is considerable scope for financial institutions to market their products – particularly insurance-related products, capital market products and banking deposit products – to households. Meanwhile, banks and non-bank financial institutions can create new loan products based, for example, on the use of housing as collateral. In that connection, BI is considering launching a banking customer education programme to ensure that Indonesian households are better informed about financial products. Also, given the limited balance sheet data for Indonesian households around the country, BI needs to conduct a national survey to obtain a broader picture of the financial sector risks posed by households as well as those to which they are exposed.

References

Ackland, R et al (1997): "Household expenditure and income data for transitional economies (HEIDE): variable list", Appendix 2 of RAD project, *Poverty and Targeting of Social Assistance in Eastern Europe and the Former Soviet Union,* World Bank, Washington, August.

Allen, M et al (2002): "A balance sheet approach to financial crisis", *IMF Working Paper,* WP/02/210, December.

Bank Indonesia, 2007, "Household Survey in Indonesia".

Benito, A, M Waldron, G Young and F Zampolli (2007): "The role of household debt and balance sheets in the monetary transmission mechanism", *Bank of England Quarterly Bulletin*, vol 7, no 1, pp 70–78.

Debelle, G (2004): "Macroeconomic implications of rising household debt", *BIS Working Paper,* no 153, Basel, June.

Haim, Y and R Levy (2007): "Using the balance sheet approach in financial stability surveillance: analyzing the Israeli economy's resilience to exchange rate risk", *Bank of Israel Discussion Paper Series – Financial Stability Section,* 17 January.

International Monetary Fund, 2005, "Household balance sheets", *Global Financial Stability Report,* Washington, April, pp 62–91.

Kohsaka, A and M Enya (2006): "The balance sheet effects and macroeconomic development in the Pacific region", paper presented at the fourth conference of the WTO, China and the Asian Economies, Beijing, 24–26 June.

Mishkin, F S (2007): "Housing and the monetary transmission mechanism", *Finance and Economics Discussion Series,* Federal Reserve Board, Washington.

Morsink, J and T Bayoumi (2001): "A peek inside the black box: the monetary transmission mechanism in Japan", *IMF Staff Papers,* vol 48, no 1.

Oesterreichische National Bank, 2008, "How does monetary policy impact the economy?" Available via Internet: www.oenb.at/en/geldp_volksw/geldpolitik/wirtschaft/how_does_monetary_policy_impact_the_economy_.jsp.

Rinaldi, L and A Sanchis-Arellano (2006): "Household debt sustainability: what explains household non-performing loans? An empirical analysis", *European Central Bank Working Paper Series*, no 570, Frankfurt, January.

Ryan, C and C Thompson (2007): "Risk and the transformation of the Australian financial system", presentation at the Reserve Bank of Australia conference, The Structure and Resilience of the Financial System, 20 August.

Samphantharak, K and R M Townsend (2006): "Households as corporate firms: constructing financial statements from integrated household surveys", *University of Chicago Working Paper Series,* http://cier.uchicago.edu/papers/2006/hh-corp-firms-061206.pdf.

Singapore Department of Statistics (2006): "Singapore household balance sheet: 2005 update and recent trends", www.singstat.gov.sg/pubn/papers/economy/op-e27.pdf.

A note on Japanese household debt: international comparison and implications for financial stability[1]

Shinobu Nakagawa[2] and Yosuke Yasui[3]

Introduction

This paper aims to show the difference in vulnerability to financial shocks between Japan's household sector and its banking sector and between the Japanese and US household sectors. For this purpose, we examine recent developments in household financial assets and liabilities, securitisation and the distribution of household income and net worth in Japan, France, Germany, the United Kingdom and the United States.

The paper is structured as follows. Section 1 highlights the differences in household financial risk preferences (ie, financial balance sheet structure) among the above-mentioned countries. Section 2 focuses on recent developments in household debt, largely home mortgages, and shows that household leverage has grown rapidly in particular countries. Section 3 discusses the role of banks in securitisation, including the transfer of credit risk to the broader financial market. Section 4 documents the quite different distributions of income and net worth across Japanese and US families. Section 5 draws some implications from the foregoing with respect to household wealth buffers and resilience to shocks, and Section 6 concludes with a summary.

1. Overview of household financial balance sheets

The average Japanese household has a financial balance sheet that is far more conservative than that of the representative household in other industrialised countries: in the case of Japan, cash and deposits represent half of total financial assets (Table 1). In contrast, the ratio for US households is only 16%, while Europeans hold about one fourth to one third of financial assets in these safe and liquid products.

Why do Japanese households prefer deposits so much over more risky financial assets? After all, other financial instruments are well developed and heavily traded in Japan, unlike in some other Asian markets. Several reasons could apply, among them (1) a representative Japanese household needs a significant down payment to purchase a house and thus would like to avoid investing in risky financial assets such as stocks, (2) most elderly people, who hold a majority of retail deposits in Japan, were educated to believe – and still believe, to some extent – that saving (such as through bank deposits) is a virtue and that the indirect finance system works, and (3) there has been no rational reason to invest in risky assets in the deflationary or disinflationary environment that has enveloped the Japanese economy for many years.

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[1] The views expressed in this paper are solely those of the authors and do not necessarily reflect those of the Bank of Japan.

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[3] International Department, Bank of Japan.

Turning to the liability side, Japanese households have a smaller exposure to debt, such as home mortgages and consumer credit, than their Western counterparts (Table 1). For example, home mortgages in Japan – the single largest component of household debt in Japan, as it is in most other countries – account for 12% of the financial balance sheet (debt plus financial surplus), about half as much as in France and Germany (28%), the United Kingdom (28%) and the United States (23%).

Table 1

Household financial balance sheets

	Japan (US$T 13.8 as of end-December 2007)	**United States** (US$T 45.3 as of end-December 2007)	**France and Germany** (US$T 10.6 as of end-December 2006)	**United Kingdom** (US$T 8.2 as of end-September 2007)
Deposits	51%	16%	32%	26%
Bonds	3%	9%	7%	1%
Stocks	11%	29%	16%	9%
Mutual funds	5%	11%	11%	6%
Life & pension insurance	26%			
Life & pension reserves		31%	29%	54%
Other[1]	5%	3%	6%	4%
Home mortgages	12%	23%	28%	28%
Consumer credit	2%	6%	1%	5%
Other[1]	10%	3%	2%	4%
Financial surplus	75%	68%	68%	62%

Note: Nonprofit organisations are included except for Japan. In France and Germany, long-term loans are assumed to be home mortgages, and short-term loans are assumed to be consumer credit.

[1] Others on the asset side in these countries are represented mainly by accounts receivable and financial derivatives, as households include private enterprises and nonprofit organisations in flow of funds statistics. In a same manner, others on the liability side are explained mostly by trade credits, accounts payable, and financial derivatives.

Sources: Bank of Japan; Bank of France; Board of Governors of the Federal Reserve System; Deutsche Bundesbank; UK Office of National Statistics.

2. Recent developments in household debt

Since about 2001, housing markets have been a prominent source of global headlines: until early 2007 because of the boom, and afterwards because of the bust in countries that experienced the earlier euphoria, particularly the United Kingdom and the United States. How were the booms created? Why were the busts so severe?

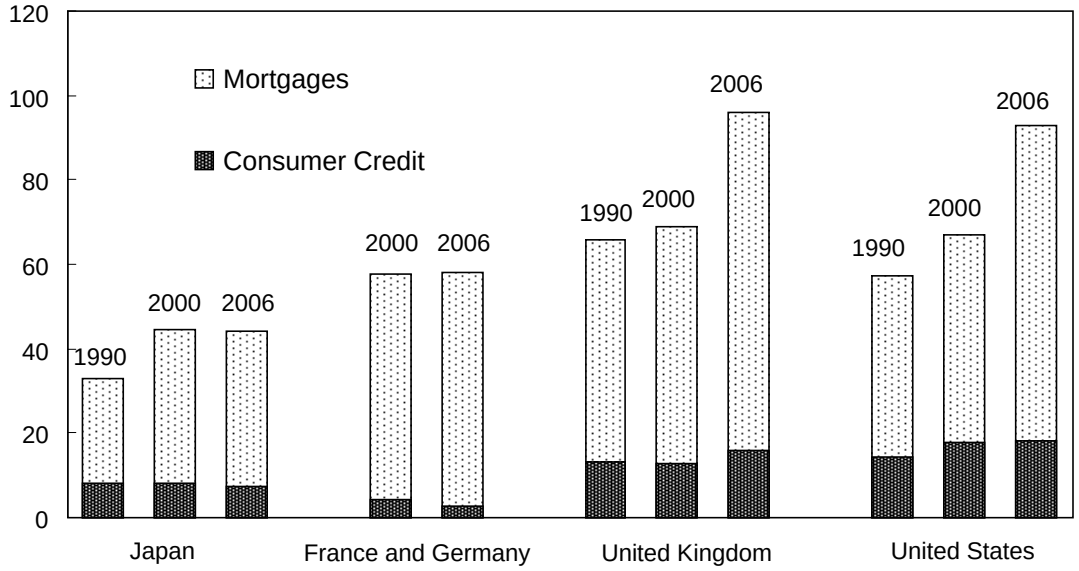
The answer to both questions is, perhaps, the extent of household “leverage” (Graph 1). The ratio of household debt to nominal GDP has rapidly increased in recent years to reach almost

100% in both the UK and US economies. In contrast, Japan, along with France and Germany, did not experience such a significant increase in leverage. For Japan, the difference is due partly to the fact that its economy has been flying at low altitude, so to speak, in the 21st century, albeit with abundant liquidity supplied by a loose monetary policy.

Interestingly, Japanese households did not rely much on mortgage funding in the bubble period around 1990 (Graph 1). The representative Japanese household accumulated the large down payment required for purchasing a home on credit and, unlike many homeowners in the United States, did not subsequently extract equity from the house through additional bank loans.

Graph 1

Household debt as a per cent of GDP



Note: See Table 1. Data for 1990 for France and Germany were not immediately available.

Sources: See Table 1.

We would thus argue that the conservative approach to debt taken by Japanese households mitigated the effects of the decade-long economic slump. Indeed, household bankruptcies were not widely recorded in that period because the quantity of safe and liquid buffer assets, such as bank deposits and postal savings, was always greater than debt on the average household balance sheet.

3. Role of the banking sector – securitisation

Who was the main character in the drama called "Japan's lost decade"? As documented in many papers, the answer is the Japanese banking sector, which holds a large quantity of household deposits (in 2006, for example, about USD 7.0 trillion, or 152% of Japanese GDP) on the liability side of its balance sheet.

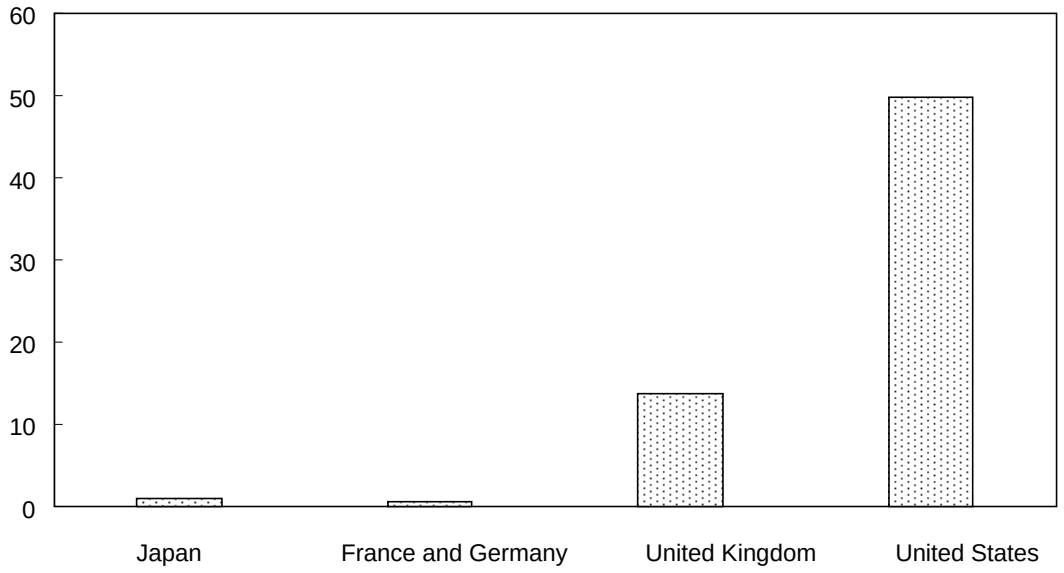
The lower level of securitisation in Japan relative to that in the United Kingdom and the United States (as shown in Graph 2 in the case of mortgages) has meant that Japanese banks have had to hold a larger proportion of loans and securities on their books. As long as the demand for corporate loans is sufficient – as it was in the bubble period, for example – this indirect money transmission system works well. However, once a significant portion of

booked assets turns sour, as they did beginning around 2000 (Graph 3), banks immediately begin to face a deterioration of capital. Banks in Japan are, after all, asset gatherers; in other words, credit risks are eventually concentrated in the Japanese banking system, which has not changed fundamentally in decades.

Securitisation markets are, in contrast, well developed in the United Kingdom and the United States. UK and US banks are eager to transfer credit risks to a variety of investors in the financial system, including life insurers, pension funds and hedge funds. We basically agree with the view of the International Monetary Fund that the spreading of credit risk through such transfers is an important source of financial stability. However, at the same time, we may now have to admit that – particularly for the markets in which off-balance sheet securitisation has deeply penetrated the credit markets – once credit, liquidity or other shocks occur, they could trigger the onset of risk contagion across a wide range of economic agents, including households.

Graph 2

Residential mortgage-backed securitisation as a per cent of GDP, 2006

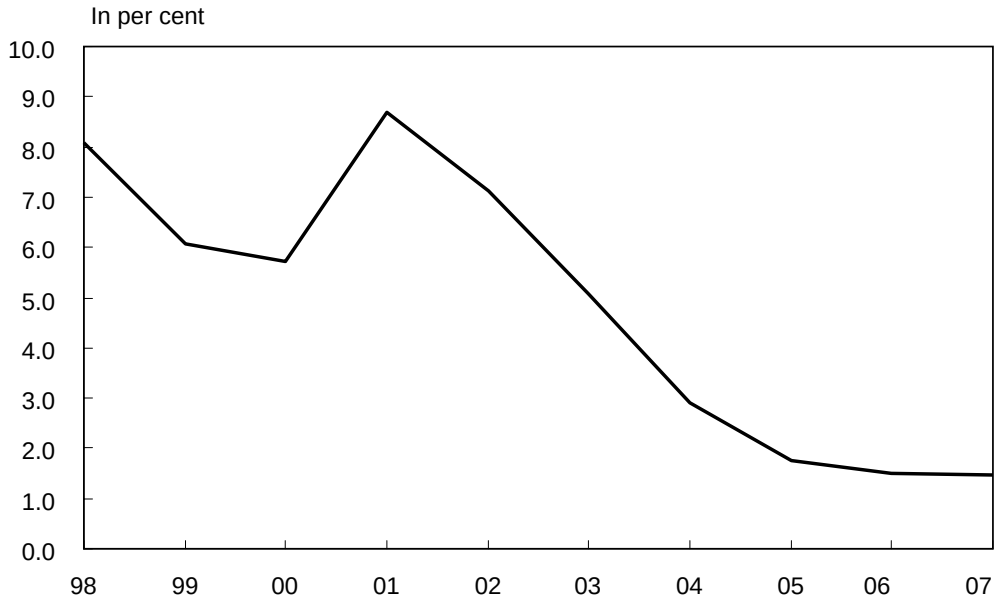


Note: US data include securities associated with home and multifamily residential mortgages.

Sources: Board of Governors of the Federal Reserve System; Japanese Ministry of Land, Infrastructure, Transport and Tourism; European Securitisation Forum.

Graph 3

Ratio of nonperforming loans in major Japanese banks



Note: Fiscal years beginning in April; nonperforming loans based on figures under the Financial Reconstruction Law divided by total loans outstanding; major banks include city banks and trust banks.

Source: Bank of Japan.

4. Distribution of household income and net worth

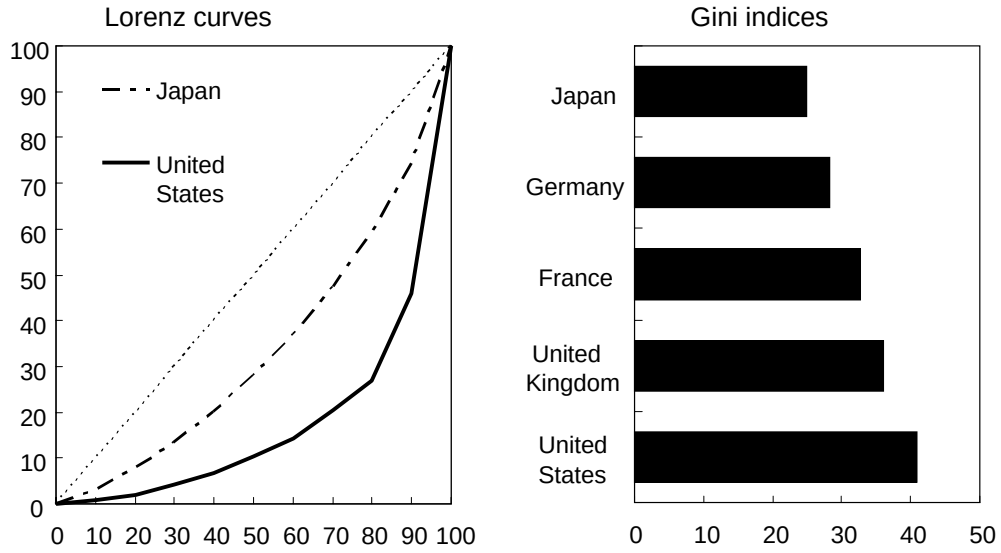
In this section we compare the financial vulnerabilities of the Japanese and US household sectors through indicators of the distribution of income and net worth.

We approach the question first through Lorenz curves for Japanese and US household income (Graph 4, left-hand panel). Both curves deviate from a perfectly egalitarian 45 degree line, but the extent of the deviation is obviously greater for the United States, where the difference between the highest and lowest income groups is far greater than in Japan. The Gini indices (Graph 4, right-hand panel) show that income inequality is greater in the United States than in the United Kingdom, France and Germany as well as Japan, where this measure of inequality is the lowest of the five countries.

We turn next to the distribution of net worth (ie, all assets, including homes, minus all liabilities) across family income groups. Net worth is one measure of a family's ability to absorb financial shocks. The richest income quintile of US households (the fifth quintile) holds 63% of total net worth, and the second richest holds 19% (Graph 5). In contrast, net worth is much more evenly distributed in Japan, mainly because of its progressive tax system.

Graph 4

Lorenz curves and Gini indices for the distribution of income

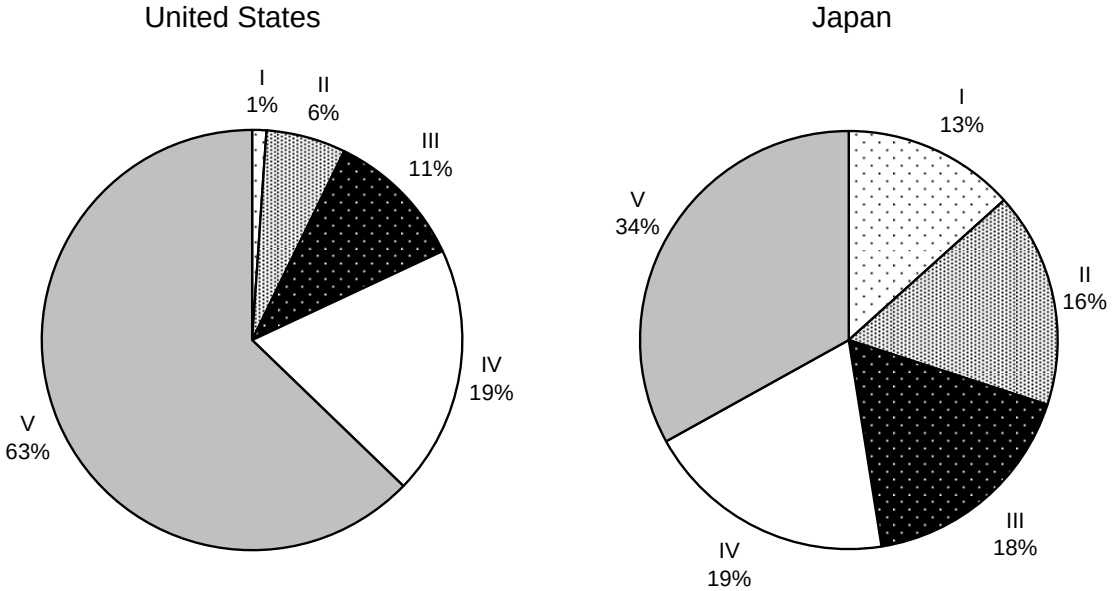


Note: Lorenz curves are for 2004 and plot population on the horizontal axis and income on the vertical axis; both axes are in per cent. Gini indices are based on the United Nations' Human Development Report 2007/2008 and indicate the extent of maldistribution of income; the higher the number, the more concentrated is the distribution.

Sources: Board of Governors of the Federal Reserve System; United Nations; Japan Ministry of Internal Affairs and Communications (Statistics Bureau).

Graph 5

Distribution of net worth by income quintile, 2004



Note: In the United States, the mean value of pretax income in 2004 was $10,800 for the first quintile, $26,100 for the second, $43,400 for the third, $69,100 for the fourth and $204,300 for the fifth. In Japan, the mean value of pretax income in 2004 was ¥1.857 million for the first quintile, ¥3.498 million for the second, ¥4.966 million for the third, ¥6.991 million for the fourth, and ¥12.285 million for the fifth; $1 is equivalent to ¥104.12 as of end-2004.

Sources: Board of Governors of the Federal Reserve System; Japan Ministry of Internal Affairs and Communications (Statistics Bureau).

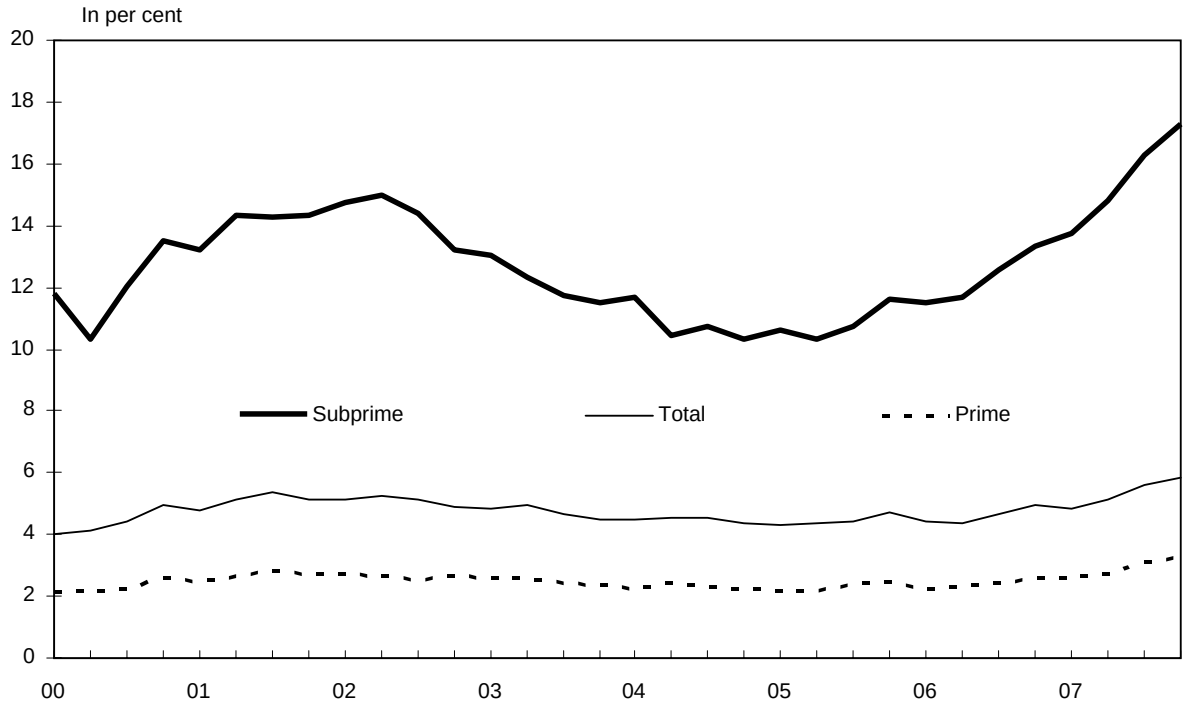
5. Implications for financial stability

What does the difference in the distribution of income and net worth between the Japanese and US household sectors imply? Which of those sectors could be considered more resilient to financial shocks? And how does the Japanese household sector compare to the Japanese banking sector in that regard?

Recall that the current turmoil in global financial markets was triggered by the fast rise of delinquencies on US subprime home mortgages, on which most borrowers in the lowest two income quintiles have to rely. Compared to prime mortgages in the United States, US subprime products have had, since 2005, significantly rising delinquency rates (Graph 6). Relative to household income cohorts in Japan, the low-income household sector in the United States has only a small amount of assets to buffer them from financial shocks. In the United States, some shocks may thus tend to hit poor families harder than others, whereas in Japan, shocks would likely be spread through the whole household sector. We would venture to say that the Japanese household sector, far from being a shock originator, is rather a shock absorber, but risk concentrations in the Japanese banking system continue to be a matter to resolve.

Graph 6

US mortgage delinquency rates



Note: Delinquent loans are those on which payments are past due 90 days or more.

Source: US Mortgage Bankers Association.

6. Summary

We compared the financial balance sheet of the typical Japanese household, especially its debt side, with its counterpart in other industrialised countries. We also compared the degree of debt securitisation and the distribution of household net worth in Japan with those

characteristics in selected other advanced economies. The differences we found can be summarised as follows:

(1) Household leverage, relative to both safe and liquid assets and to GDP, is smaller in Japan than in other industrialised countries, and was so even during Japan's bubble period.

(2) The finances of Japanese households were not severely damaged by the mid-1990s bursting of the bubble. Banks, however, with their large accumulation of household deposits on the liability side of their balance sheets, were a victim of their large holdings of defaulted corporate loans and the resulting capital deterioration during the bust; in response, banks tightened credit significantly during this period.

(3) Household net worth in Japan is not highly concentrated. Thus, regardless of income level, Japanese households are in general resilient to shocks thanks to a sizeable buffer of assets and moderate leverage. The situation is quite different in the United States, where the distribution of net worth among households is highly skewed in favour of the highest-income cohorts. With only a thin buffer of assets, low-income families in the United States – the subprime cohorts – could be vulnerable to market shocks.

Household debt, the savings rate and monetary policy: the Korean experience

Kyuil Chung[1]

Introduction

Korea experienced a rapid increase of household debt in the early 2000s. The heavy burden of debt repayment in the household sector has made the Korean economy less stable. Specifically, the surge of household debt has caused the household savings rate to fall and thereby heightened the volatility of private consumption. Given this environment, it is essential for the central bank to conduct monetary policy appropriately to mitigate consumption volatility.

We first describe the expansion of household debt and its consequences. We then examine how the decline of the savings rate affects the responses of economic variables to monetary policy shocks and what the desirable monetary policy is.

Surge in household debt and its consequences

Korean household credit[2] provided by depository corporations and non-bank financing corporations has increased sharply since 2000. As Graph 1 shows, Korean household credit outstanding increased from around KRW 200 trillion (about US$ 200 billion) in 2000 to KRW 450 trillion in 2002, more than doubling within two years. While loans to households were the main factor behind the rise in household credit, merchandise credit, which is provided mainly by credit card companies, also played an important role (Graph 2).

There are several possible causes of this rapid expansion of household debt. Let's look first at the Korean macroeconomic indicators. As shown in Graph 3, Korea experienced a severe recession, with a negative 7% GDP growth rate, during the Asian financial crisis of 1997–98. On the other hand, inflation was quite stable after the crisis due to low global inflation. The Bank of Korea therefore adopted an easy monetary policy stance, and interest rates remained at relatively low levels, with the policy rate (one-day call rate) in the range of 3–5% (Graph 4). This low interest rate environment was the main reason household debt soared. Another reason was skyrocketing housing prices. Fuelled by limited housing supply during the 1990s and ample liquidity since the crisis, housing prices have risen steeply since 2001 (Graph 4).

---

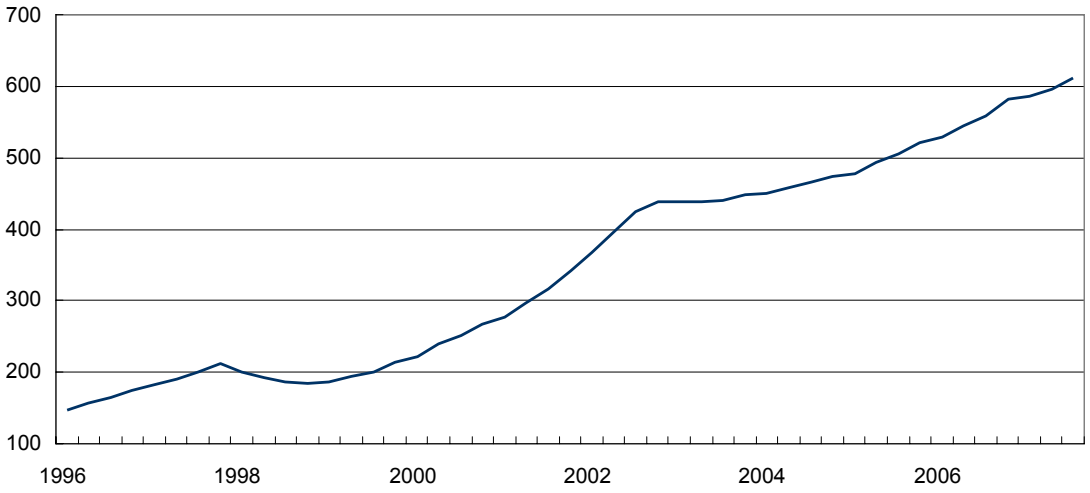
[1] Bank of Korea.

[2] This includes loans (general loans to households such as loans for housing, cash advances and car loans, etc.) and merchandise credit.

Graph 1

Trend of household credit

Balance, in trillions of won

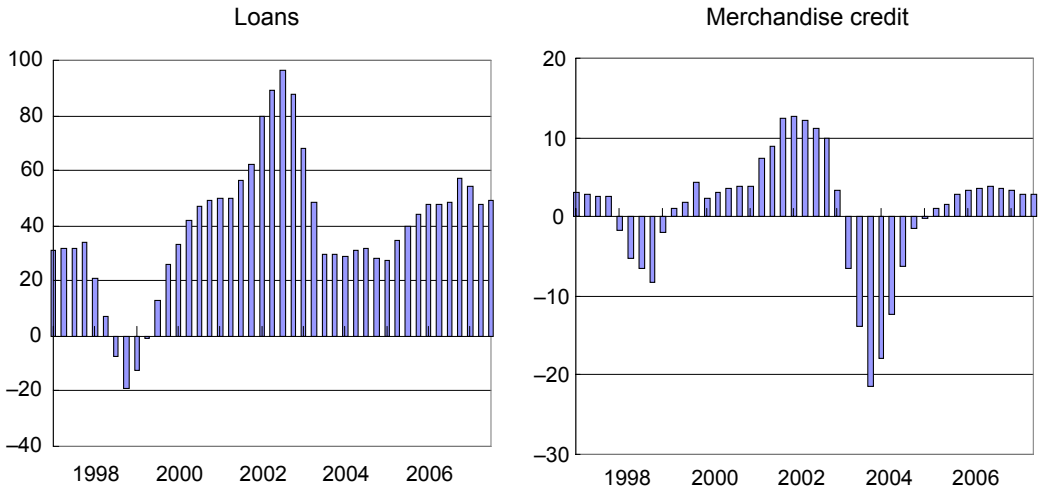


Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 2

Trend of increase in household credit

In trillions of won

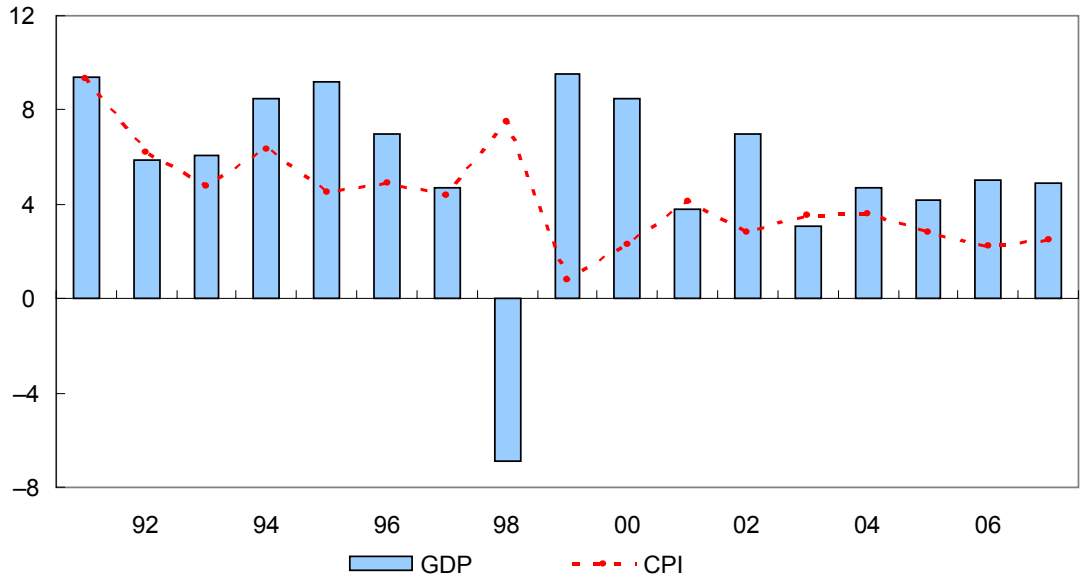


Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 3

Trends of GDP growth and CPI inflation

In per cent

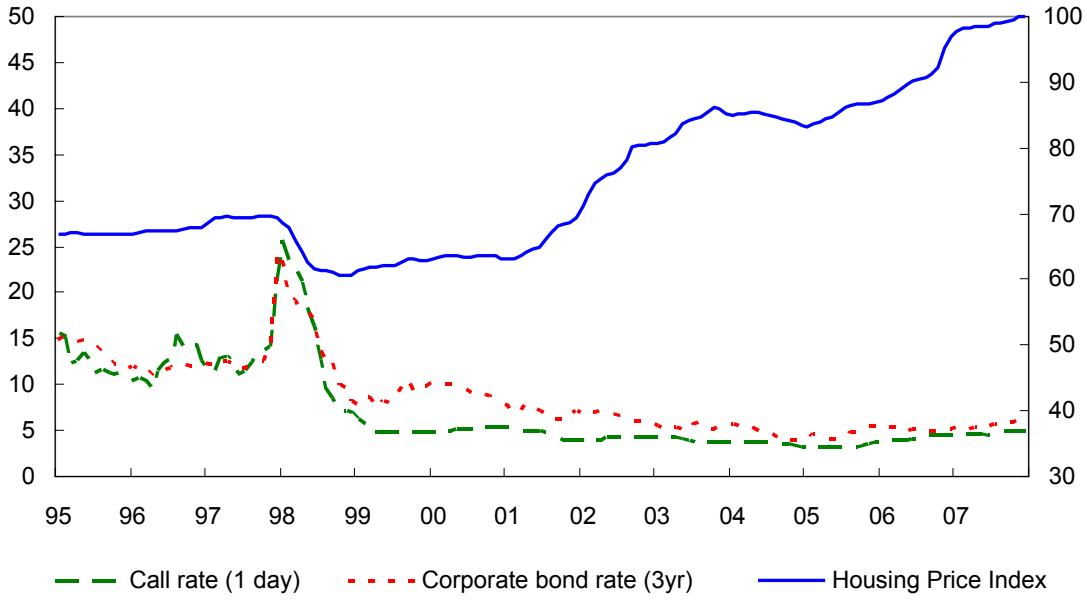


Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 4

Trends of housing price index and interest rates

Interest rates, in percent (lhs) Housing prices, Dec 2007 = 100 (rhs)



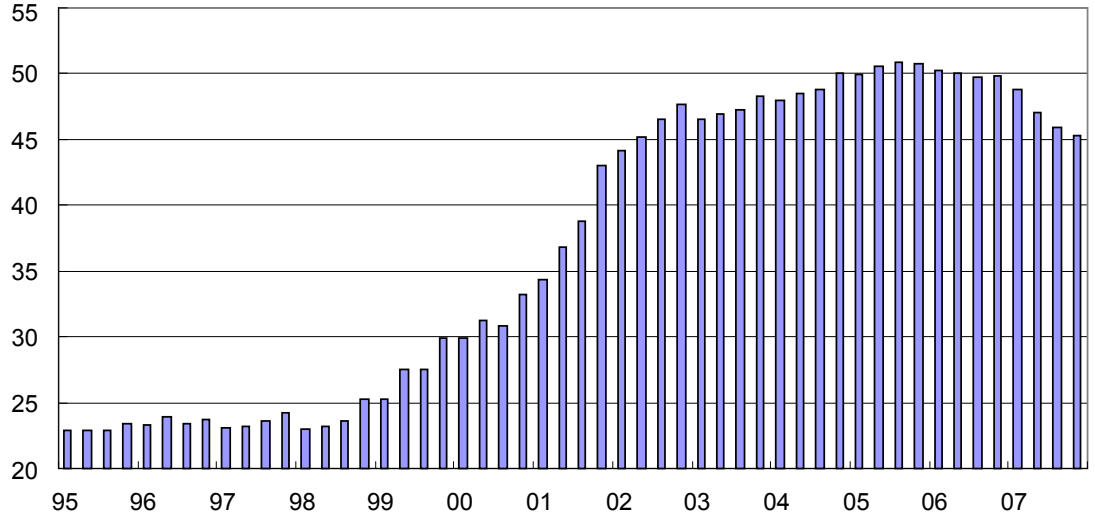
Source: Economic Statistics System (ECOS), Bank of Korea.

On the supply side, corporate demand for funds was greatly blunted due to financial restructuring in the corporate sector and the economic slowdown that followed the financial crisis. Hence, financial institutions expanded their businesses aggressively to the household sector. Graph 5 shows that the share of household loans in total loans extended by financial corporations increased rapidly, from less than 25% in 1997 to nearly 50% in 2002.

Graph 5

Share of household loans in total loans

In per cent

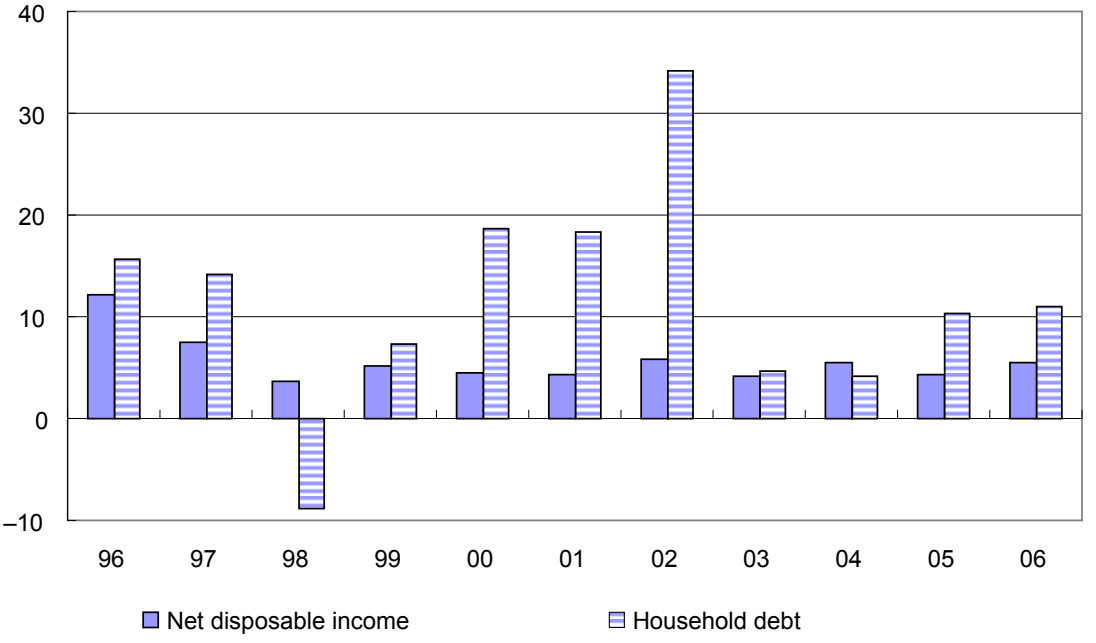


Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 6

Growth trends of net disposable income and household debt

In per cent



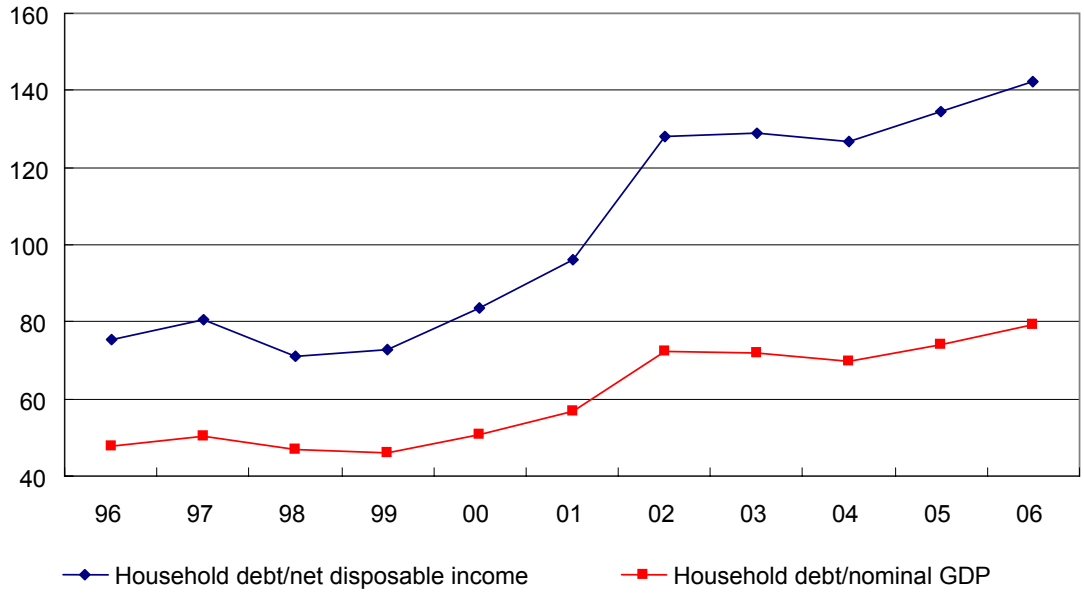
Source: Economic Statistics System (ECOS), Bank of Korea.

This rapid increase in household debt has not continued without negative consequences. As shown in Graph 6, the rate of growth of household debt[3] exceeded that of household net disposable income by a large amount between 2000 and 2002. Hence, household financial indicators such as the ratios of household debt to net disposable income and of household debt to nominal GDP have severely deteriorated since 2000 (Graph 7).

Graph 7

Trends of household financial indicators

In per cent



Source: Economic Statistics System (ECOS), Bank of Korea.

Reflecting these weak financial conditions, the household net savings rate, which had maintained a level of 15–16% before the financial crisis, plummeted to 9.9% in 2000 and then to 2.0% in 2002, before increasing slightly, to 3.5% in 2006 (see Table 1). This pattern would appear to indicate a gradual rise in the proportion of households living from hand to mouth – ie using current income for current consumption – compared to households that smooth consumption over time by increasing and decreasing savings as circumstances dictate.

As shown in Graph 8, which divides Korean workers into five groups according to income, the savings rate of those with the highest incomes (Group 5) did not change much between the pre- and post-crisis periods, except for a temporary rise in 1998, during the crisis period. The savings rates of the middle class – Groups 2, 3 and 4 – have fallen dramatically due to the crisis. For example, the savings rate of Group 2, which held steady at 20% before the crisis, dropped to approximately 10% after the crisis. Moreover, the savings rate of households in the bottom 20% (Group 1), which was low before the crisis, has been negative since the crisis – ie households in this income group have resorted to borrowing.

[3] Based on financial assets and liabilities data in the national flow of funds account.

Table 1

Trend of household net savings rate[1]

In per cent

1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
16.4	15.1	23.1	16.2	9.9	5.9	2.0	3.6	5.7	4.2	3.5

[1] Obtained by dividing net private sector savings in the national accounts by net adjusted disposable income.

Source: Economic Statistics System (ECOS), Bank of Korea.

The savings rate of Group 1 was –8% in 1998, declined to –15% in 1999, recovered to –10% for the next three years and deteriorated again in 2004, to –17%. This indicates that the number of households living from hand to mouth seems to have risen rapidly since the crisis and can be estimated to account for over 20% of Korean households.[4]

According to the permanent income hypothesis, the main function of savings is smoothing consumption. When current income is below permanent income, households withdraw money from their bank accounts and spend it on consumption. On the other hand, when current income is above permanent income, households save the extra money to prepare for possible negative income shocks in the future. Therefore, the decline of household net savings rates weakens consumption smoothing. The empirical evidence for this phenomenon will be provided below.

Another important point that should be mentioned here is the relationship between borrowing and consumption smoothing. Since borrowing is negative saving, it plays a role in smoothing consumption as long as it is temporary. However, if negative saving persists, borrowing can also constrain consumption smoothing by increasing the debt servicing burden. According to the Korea National Statistical Office, the ratio of debt redemption to disposable income[5] increased from 16.1% in 1999 to 24.8% in 2005. This vicious circle (consumption financed by borrowing → increased debt redemption → sharp reduction in consumption) has been one of the main causes[6] of private consumption volatility in Korea since the financial crisis.

Looking at the volatility (standard deviation) of GDP growth and private consumption growth rates during the periods before and after the financial crisis (Table 2), we find that from the first quarter of 1985 to the second quarter of 1997, private consumption was more stable than GDP, with growth rate volatilities of 1.52 and 1.97, respectively. However, the volatilities of GDP and private consumption growth increased to 2.58 and 4.32, respectively, between the first quarter of 1999 and the third quarter of 2006. Private consumption volatility thus contributed to the increase in the volatility of GDP growth.

The reversal in the comparative volatilities of GDP and private consumption is visible in the trends of the growth rates of the two indices. Graph 9 shows that, before the crisis, the private consumption growth rate was lower than the GDP growth rate during a period of expansion and higher than the GDP growth rate during a period of contraction. Since the crisis, however, private consumption has contracted dramatically during economic declines

[4] Considering that the savings rate of Group 2 fell steeply, from 20% to 10%, a considerable proportion of that group consists of households living from hand to mouth and unable to save.

[5] *Annual report on household income and expenditure survey*, Korea National Statistical Office.

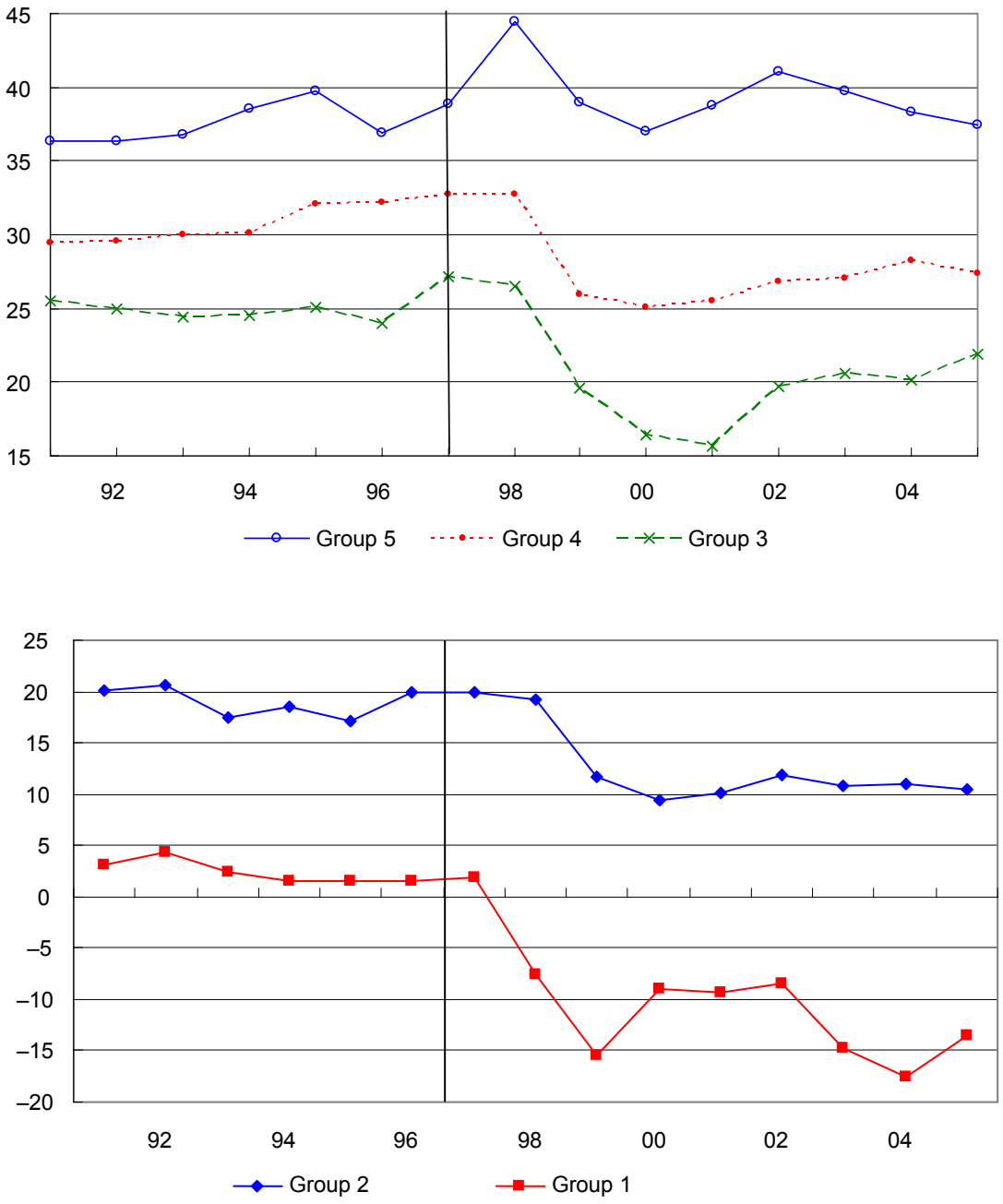
[6] The increased share of transportation, communication via mobiles and internet and leisure activity in total consumption is mentioned as another reason for consumption volatility, since these items are very sensitive to business cycles.

and increased sharply during economic upswings. Thus, we can see that private consumption played the role of a buffer against the business cycle before the crisis but has exacerbated economic fluctuations since then.

Graph 8

Trends of savings rates by income group[1]

In per cent



[1] Group 5 consists of the households with the highest incomes; Group 1, the lowest.

Source: *Annual report on household income and expenditure survey,* Korea National Statistical Office.

Table 2

Volatility and components of GDP growth

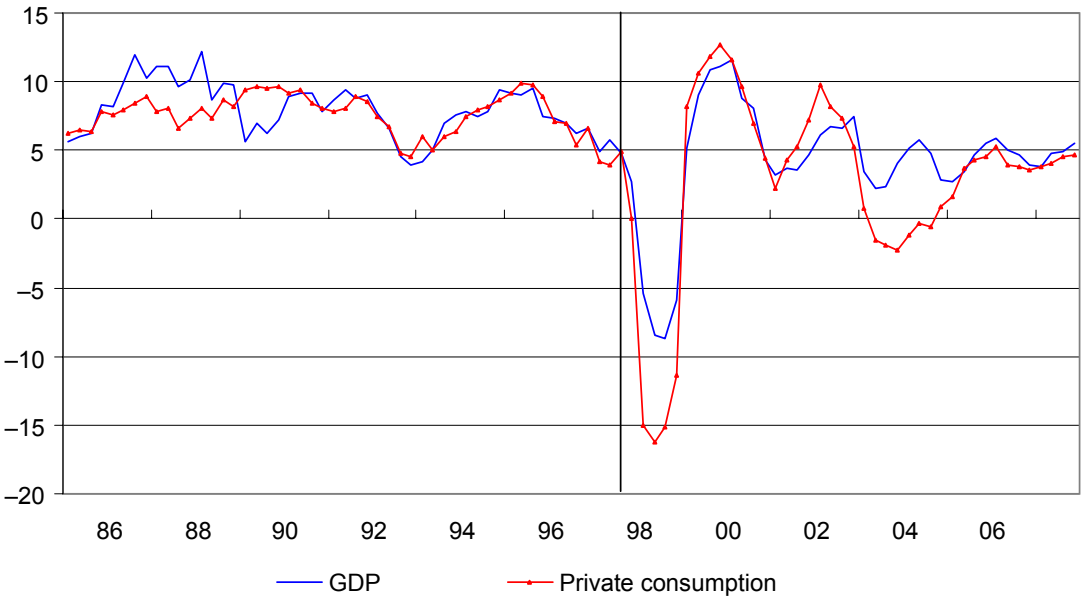
	GDP	Private consumption	Gross investment	Exports	Imports
Q1 1985–Q2 1997	1.97	1.52	7.40	8.41	7.06
Q1 1999–Q3 2006	2.58	4.32	7.92	7.95	9.10

Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 9

Growth trends of GDP and private consumption

Percentage change, year-on-year



Source: Economic Statistics System (ECOS), Bank of Korea.

Implications for monetary policy

We have shown the causes and consequences of household debt. Among many other things, the increased volatility of consumption has important implications for macroeconomic stability. The next question is how monetary policy should respond to the instability caused by consumption volatility. To answer this question, we first construct a model and examine the effect of the increase in the number of hand-to-mouth households on each economic variable in response to a monetary policy shock. We then explore the monetary policy that can mitigate consumption volatility based on a central bank's loss function.

To investigate the effect of the increase in the number of hand-to-mouth households, a counterfactual simulation is done based on the dynamic stochastic general equilibrium

(DSGE) model of Galí et al (2004). In this model, the household sector is divided into optimising households and hand-to-mouth households.

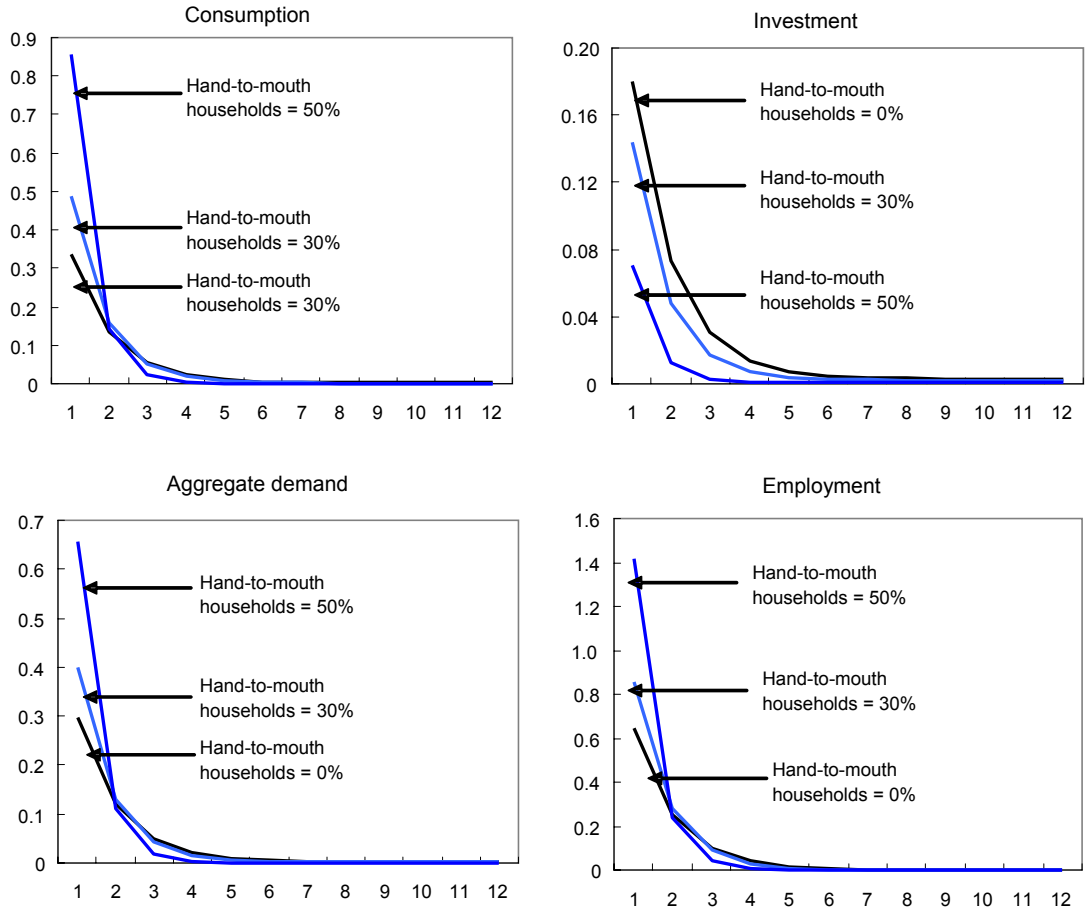
We conduct a simulation of the dynamic effects of a change in the call rate (the Bank of Korea policy rate), on the assumption that all households show optimising behaviour, using established parameter values. We then examine how the effects of monetary policy change when a major parameter value – the ratio (λ) of hand-to-mouth households to total households – is altered, considering the changes in the monetary policy environment since the crisis.

The results are as follows. If a rate cut of 25 basis points occurs under the baseline model where hand-to-mouth households do not exist, total consumption increases by 0.32% in the first quarter. The scale of this increase gradually declines, and consumption generally returns to a steady state after the seventh or eighth quarter because of the effect running from interest rate cut → reduction in savings → increase in consumption. This result demonstrates that the effect of an interest rate cut is likely to persist for a longer time if only optimising households are considered. Next, the simulation shows that when the ratio (λ) of hand-to-mouth households gradually rises (λ: 0% → 30% → 50%), a rate cut of 25 basis points leads to an increase in consumption growth in the first quarter (0.32% → 0.49% → 0.85%) in accordance with the rise in the ratio of hand-to-mouth households, whereas the duration of the response shrinks from seven–eight quarters (λ = 0%) to four quarters (λ = 50%) as shown in Graph 10.

Graph 10

Effect of ratio of hand-to-mouth households on interest rate cut of 25 basis points

As a percentage of total households, by quarter

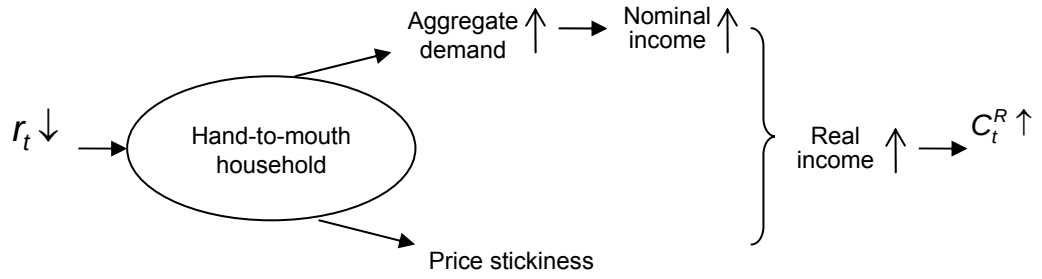


Source: Chung (2008).

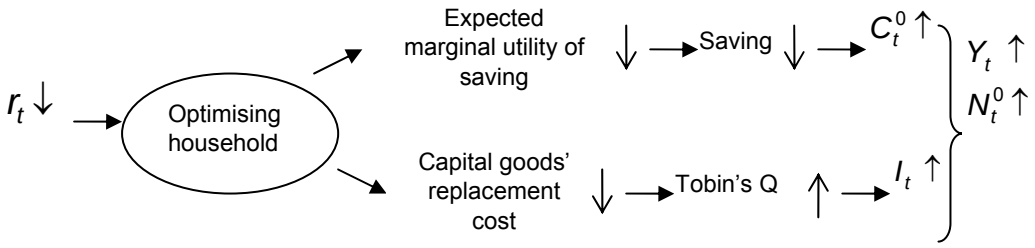
This is attributable to the fact that the consumption of hand-to-mouth households expands initially due to the temporary increase of real wages after the interest rate cut under the sticky price model. In the case of optimising households, consumption increases due to the growth in real wages and reduction in savings, but the initial boost to consumption does not last long and quickly disappears as the ratio of optimising households that smooth consumption falls (Box 1).

Box 1

Interest rate transmission channel



⇒ An interest rate cut causes a temporary rise in real wages and a subsequent increase in consumption.



⇒ The interest rate cut boosts the consumption and investment of optimising households, which leads to an increase in output and employment.

Source: Chung (2008).

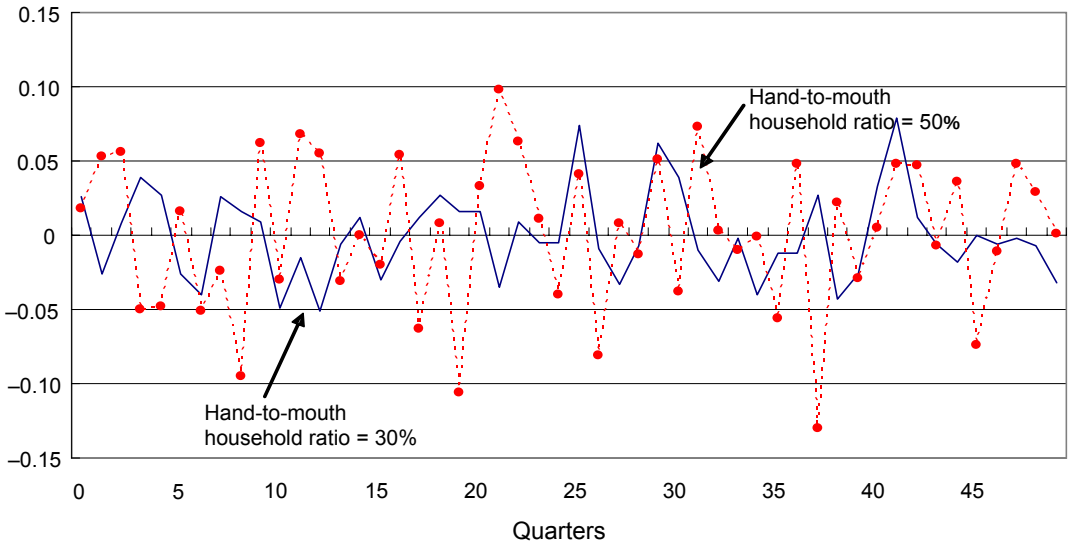
This gives us a clear explanation for the relationship between the ratio of hand-to-mouth households and consumption volatility: as the ratio of hand-to-mouth households decreases, the degree of consumption smoothing falls, which leads to greater consumption volatility.

In order to check this relationship from another perspective, we generate two consumption paths from the DSGE model changing the number of hand-to-mouth households and display them on the same graph. Graph 11 confirms that a higher number of hand-to-mouth households is associated with greater consumption volatility. It shows a comparison of consumption volatilities under two different ratios (λ) of hand-to-mouth households – 30% and 50%. Consumption is much more volatile when λ = 50% than when λ = 30%. This result indicates that although an expansionary monetary policy boosts consumption initially, as the ratio of hand-to-mouth households increases, such a policy is likely to actually accentuate the business cycle as its effect disappears in a short time.

Graph 11

Ratio of hand-to-mouth households and consumption volatility

As a percentage of total households



Source: Chung (2008).

Table 3 indicates what the appropriate monetary policy would be in this situation. This table shows the loss function values by the coefficients of interest rate rules. The loss function is defined as the sum of the variances of inflation and output. In the interest of brevity, the target inflation is set at zero. A central bank may respond more strongly to inflation or to output according to its preference, but it is expected to choose the one with lower loss function values.

When the central bank increases (reduces) its response to the inflation and output gaps by twice (half) the coefficient in the estimated interest rate rule, the loss function value is smaller for the former than for the latter. This is due to the fact that when inflation is stabilised, real wages become stable, resulting in the moderation of consumption volatility. Since wages are the only source of income for the hand-to-mouth households, the stability of real wages is essential to the stability of consumption. Consequently, the central bank can alleviate the volatility of macroeconomic variables to a relatively greater degree by responding more actively to inflation than to output.

Conclusion

During the early 2000s, household debt in Korea increased rapidly due to low interest rates, rising house prices and the aggressive marketing of loans to households. Escalating household debt was one of the reasons there were large fluctuations in private consumption. This is why the central bank needs to conduct monetary policy properly in order to mitigate consumption volatility.

This paper demonstrates that given the current rapid decline in the household savings rate, the effectiveness of an expansionary monetary policy in boosting consumption is expected to be substantially constrained. Thus, to alleviate consumption volatility, it is more effective for the central bank to respond to inflation than to output.

Table 3

Loss function value[1] by coefficient of interest rate rule

λ	**0**	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.5 \times 0.491\hat{\pi}_t + 0.106\hat{y}_t$ (inflation gap coefficient reduced by half)						
$L_t = \pi_t^2 + y_t^2$	0.024	0.025	0.029	0.035	0. 041	0.063
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.491\hat{\pi}_t + 0.5 \times 0.106\hat{y}_t$ (output gap coefficient reduced by half)						
$L_t = \pi_t^2 + y_t^2$	0.025	0.026	0.033	0.037	0.042	0.064
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.491\hat{\pi}_t + 0.106\hat{y}_t$ (baseline model)						
$L_t = \pi_t^2 + y_t^2$	0.022	0.025	0.026	0.032	0.037	0.050
$\hat{r}_t = 0.67\hat{r}_{t-1} + 2 \times 0.491\hat{\pi}_t + 0.106\hat{y}_t$ (inflation gap coefficient doubled)						
$L_t = \pi_t^2 + y_t^2$	0.019	0.019	0.023	0.024	0.026	0.031
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.491\hat{\pi}_t + 2 \times 0.106\hat{y}_t$ (output gap coefficient doubled)						
$L_t = \pi_t^2 + y_t^2$	0.020	0.025	0.026	0.029	0.030	0.039

[1] Standard deviation.

Source: Chung (2008).

References

Amato, J D and T Laubach (2003): "Rule-of-thumb behavior and monetary policy", *European Economic Review*, vol 47, no 5, October, pp 791–831.

Bank of Korea (2001–07): *Household credit trends*, www.bok.or.kr.

——— (2001–07): *Monetary Policy Report,* www.bok.or.kr.

Chung, K (2008): "Decrease in household savings rate and effectiveness of monetary policy", *The Bank of Korea Economic Papers*, no 89, 3 January.

Galí, J, J D López-Salido and J Vallés (2004): "Rule-of-thumb consumers and the design of interest rate rules", *Journal of Money, Credit, and Banking*, vol 36, no 4, August, pp 739–63.

Mankiw, N G (2000): "The savers-spenders theory of fiscal policy", *American Economic Review*, vol 90, no 2, May, pp 120–5.

Woodford, M (2003): *Interest and prices: foundations of a theory of monetary policy,* Princeton University Press.

Credit card lending distress in Korea in 2003

Taesoo Kang and Guonan Ma[1]

Introduction

Korea experienced a painful credit card crisis in 2003, with a significant impact on its financial system. A massive credit card lending boom was followed by a wrenching bust. Many credit card issuers were on the brink of collapse as they struggled with deteriorating asset quality and difficult liquidity and solvency challenges, which in turn exposed the banking sector and financial markets to systemic risk and severely affected the real economy.

This paper, which is based partly on Kang and Ma (2007), aims to uncover the causes of the crisis and draw relevant policy lessons from it. Specifically, we try to shed light on three questions. First, why did competition in credit card lending, a line of business that is well established in many other countries, lead to excesses in Korea? Second, who were the main characters in the boom-bust cycle in the credit card industry? Third, what lessons can policymakers and market players learn from this episode? Answers to these questions will be valuable not only for Korea but also for other emerging markets, such as China and India, where credit card lending is just taking off.

The paper is organised as follows. First, we discuss the household lending and credit card sector in Korea. Second, we explore the factors driving the credit card lending boom. Third, we analyse the dynamics of the bust in 2003 and its impact on the financial system and the economy. Finally, we explore the policy implications of the credit card lending crisis before concluding.

Korea's credit card sector

After the Asian financial crisis in 1997, lending to households started outpacing total bank lending in Korea. Between 1999 and 2005, the share of household loans in total bank loans outstanding grew from 30 per cent to over 50 per cent, as bank lending to consumers grew twice as fast as total bank lending (Graph 1).

A combination of demand and supply side factors contributed to this marked shift to consumer finance. First, after the Asian financial crisis, weak corporate loan demand and the easing of monetary policy to stimulate the economy led to ample liquidity in the banking system. During 1998–2000, the loan-to-deposit ratio in Korea declined by 10–15 percentage points. With lending to households growing faster than the overall loan book, corporate loans as a share of total deposits fell even further. This, together with possible capital savings from the banks' mortgage business, drove banks to tap the consumer finance business more aggressively. Second, rising living standards and house prices in Korea increased consumer demand for credit, as consumer finance is often regarded as a superior good. Third, rapid progress in information technology reduced the costs of retail finance. Finally, financial

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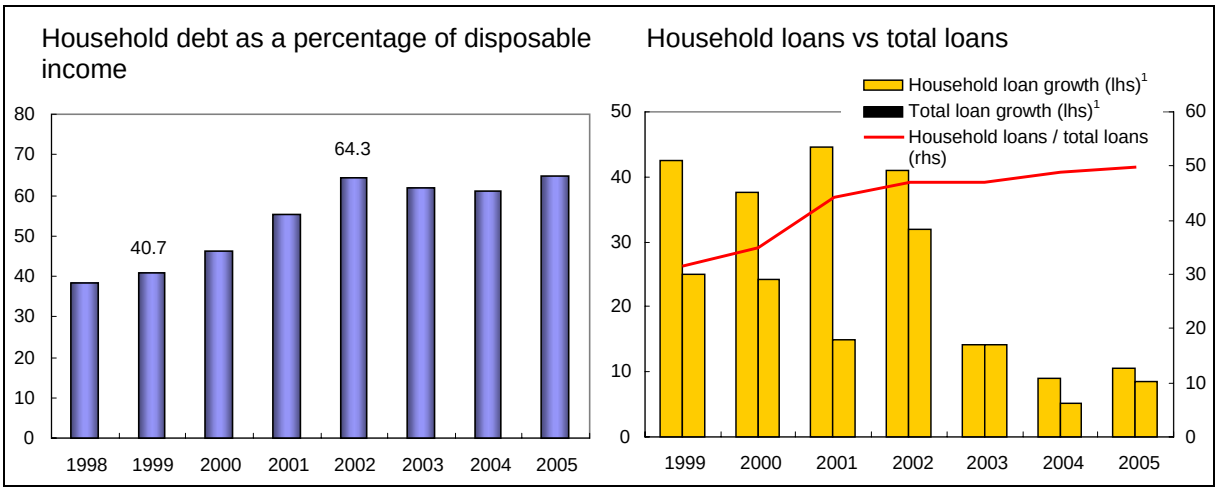
deregulation, new local and foreign entrants in the banking sector and government policies also boosted formal lending to the household sector.

Graph 1

Growth of household debt in Korea



[1] Year-on-year growth, in per cent.

Sources: Bank of Korea; Financial Supervisory Service of Korea.

Credit card business in particular has been one of the fastest-growing areas of unsecured retail finance in Korea, as banks diversify and seek higher returns on household lending and policymakers pursue a growth strategy that is less dependent on exports. A growing credit card market has also provided a broader portion of the population with improved access to financing and been a huge source of profits for banks and other lenders, thereby enhancing welfare and offering new business opportunities.

Table 1

Credit card market in Korea

	1999	2000	2001	2002	2003	2004	2005	2006
Number of credit cards issued[1]	39.0 (–7.2)	57.9 (48.5)	89.3 (54.3)	104.8 (17.3)	95.5 (–8.9)	83.5 (–16.0)	82.9 (–0.7)	91.1 (9.9)
Trading amount[2]	90.8 (42.9)	224.9 (147.8)	443.4 (97.1)	622.9 (40.5)	480.5 (–22.9)	357.8 (–25.5)	363.8 (1.7)	368.3 (1.2)
Total assets[2]	18.2	32.3	72.0	100.3	55.0	35.8	33.8	35.7
Net income[2]	–0.3	0.9	1.4	0.2	–6.2	–1.3	0.3	2.2

Year-on-year growth rates, in per cent, are shown in parentheses.

[1] In millions. [2] In trillions of won.

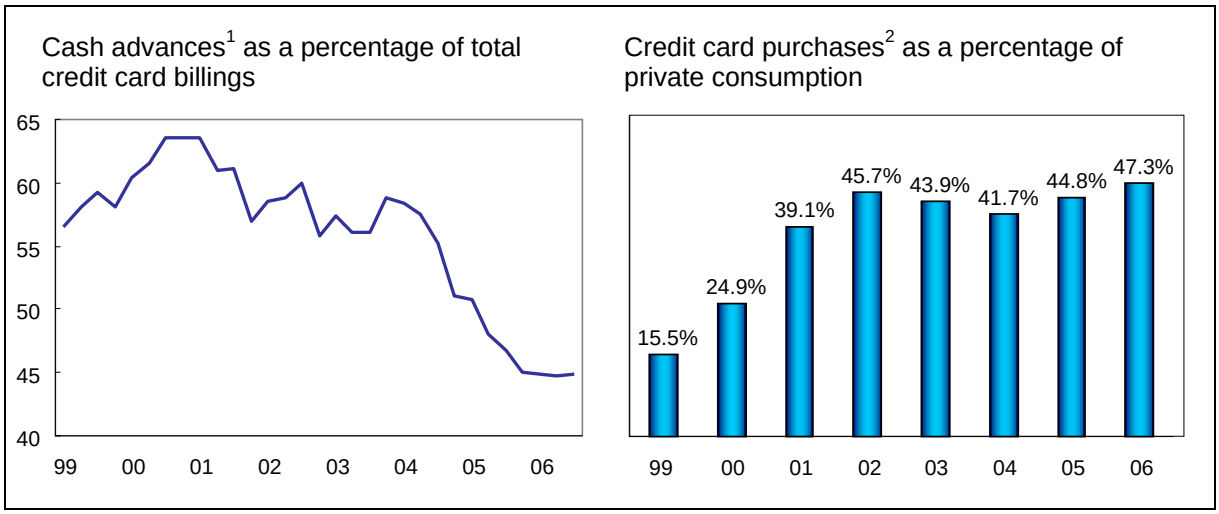
Sources: Bank of Korea; Financial Supervisory Service of Korea.

During 1999–2002, Korea's credit card market grew substantially, thanks to policy measures put in place by the government. The number of credit cards tripled, from 39 million to 105 million, while the volume of total credit card transactions expanded more than sixfold. The net earnings of the Korean credit card industry swung from negative to positive between

1999 and 2001 (Table 1). Mostly as a result of this headlong expansion, the ratio of household debt to disposable income jumped to a high of 64 per cent in 2002, from 41 per cent in 1999 (Graph 1). Card purchases of goods and services were on an upward trend, accounting for as much as 45.7 per cent of private consumption expenditure in 2002, and cash advances soared to 65 per cent of total credit card billing at one point (Graph 2). Meanwhile, the per capita credit card balance outstanding and its ratio to household disposable income rose fivefold during the period. As a result, credit card receivables more than doubled as a share of total bank loans and total household loans (Table 2).

Graph 2

Credit card use in Korea: cash advances vs purchases



[1] Card loans; flows. [2] All credit card purchases of goods and services; flows.

Sources: Bank of Korea; Financial Supervisory Service of Korea.

This paper focuses mainly on the lending side of the credit card business in Korea. Credit cards serve two primary functions: payment and financing. Accordingly, credit card users generally fall into two groups: “transactors”, who use credit cards mostly for payment convenience, and “revolvers”, who borrow regularly on their credit cards and pay interest accordingly. Transactors are typically better credit risks than revolvers, but they generate limited earnings for card issuers, principally through merchant discount fees. In contrast, compared to other forms of household credit, credit cards are a high-yield, unsecured form of personal lending; on average, they account for more than half of the net earnings of credit card issuers in Korea. The growth of credit card lending and increases in the size of credit card loans represent new opportunities both for consumers, in terms of improved access to credit and consumption smoothing, and for the financial industry, in terms of loan portfolio diversification and higher margins, but they also increase risks to the financial system.

Table 2

Credit card balances outstanding in Korea

	1999	2000	2001	2002	2003	2004	2005	2006
Amount per capita[1]	328	608	1,178	1,683	963	651	682	769
As a percentage of total bank loans	7.3	10.4	20.1	21.3	10.2	6.3	5.5	5.1
As a percentage of household loans	22.9	29.7	45.7	45.1	21.7	13.0	11.0	10.3
As a percentage of disposable income	5.4	9.2	19.7	25.9	13.6	8.4	7.6	7.6

[1] In US dollars.

Sources: Bank of Korea; Financial Supervisory Service of Korea.

The credit card lending boom

Government policies designed to cushion the severe economic downturn that followed the financial crisis of 1997–98 contributed in significant measure to the Korean credit card lending boom of 1999–2002. The policy package included tax benefits for merchants accepting credit cards and, for cardholders, income tax deductions linked to their credit card purchases. On the regulatory front, the authorities abolished both the administrative ceiling of KRW 700,000 ($610) on monthly cash advances and the leverage limit (up to 20 times capital) for credit card issuers. Moreover, the weighted regulatory capital requirement for specialty issuers was only 7 per cent, despite the inherently undiversified nature of their unsecured credit card lending business. Such policy measures encouraged credit card companies to embark on an aggressive campaign for the initially lucrative cash lending business.

Although the government's tax incentives might indeed have stimulated credit card spending and made Korea a special case (Lee (2005)), one should not overstate their role in the card lending bubble. First, for cardholders, card issuers and card-accepting merchants alike, the tax incentives applied only to credit card purchases and not to credit card cash advances, and it was the latter that surged out of control during 2001–02, when issuers were deliberately targeting revolvers. Second, to the extent that the bulk of the increased credit card spending represented a simple substitution for (replacement of) cash spending, households' ability to service credit card receivables should not have been materially compromised. Third, even if some cardholders overspent to take advantage of tax benefits, interest rates on other available unsecured personal loans ranged from 7 to 9 per cent, compared with the prevailing 20 per cent annual interest rate on credit cards. Fourth, riskier households should have been much less motivated to take advantage of income tax deductions, as the marginal income tax rates for the lower income brackets are only 8–17 per cent. Finally, the income tax deduction related to card purchases, although reduced to 15 per cent in 2005, from 20 per cent in 1999, is still in effect. In sum, while tax incentives did promote the use of credit cards as a means of payment, we doubt that it was a principal cause of the boom.

We found that six factors were responsible for the relaxation of lending standards and excessive growth in credit card lending in Korea (Kang and Ma (2007)). First, as noted earlier, weaker corporate loan demand, ample liquidity in the banking system and lower

interest rates in the wake of the Asian financial crisis put pressure on banks and other lenders to focus more on consumer lending. Commercial banks in Korea financed not only their own credit card operations but also provided loans to the dominant monoline credit card issuers. Declines in interest rates at the time also led Korean households to seek higher yields in fixed income mutual funds of investment trust companies (ITCs), themselves heavily exposed to papers issued by monoline credit card companies. In a search for yield, pension funds and insurance companies also made sizeable investments in credit card companies.

Second, during a period of financial liberalisation in Korea, there was an influx of new and often less experienced entrants into the credit card market. These new players intensified competition among credit card issuers for market share, leading to the relaxation of lending standards and stronger credit expansion (Dell'Ariccia and Marquez (2006)). Some chaebols with limited consumer banking experience rapidly expanded their credit card business, capturing as much as 76 per cent of domestic credit card transactions by 2002. These changes in the competitive landscape probably led even some of the dominant existing firms to relax their screening and underwriting standards as well.

Third, economies of scale in the credit card business might also have contributed to competition for market share. The credit card business often involves large initial sunk costs, as companies set up the infrastructure for data processing, credit scoring, account management and settlement. Moreover, credit card issuers need a sufficient cardholder base to attract merchants (Evans and Schmalensee (2005)). Once the initial investment is made, however, the marginal cost of adding new accounts is relatively low, reinforcing the incentive to chase market share. Such industry and cost structures tend to intensify market competition. Also, Korean credit card issuers usually do not outsource many of their operations and therefore need more accounts for their credit card operations to break even (Yun (2004)). The period leading up to the credit card crisis witnessed aggressive marketing campaigns by companies seeking to recruit new cardholders through mass mailings, telemarketing and even street solicitation, with little screening of applicants.

Fourth, a limited infrastructure for credit reporting and sharing further contributed to the build-up of excessive risk in credit card lending portfolios. The coverage of Korea's credit reporting system was limited in terms of reporting lenders, debtor base and types of data collected (Miller (2003), He et al (2005), Jeong (2006), Park (2008)). Further complicating the situation, the Korean government erased as many as half of the available personal delinquency records at the local bankers association in May 2001, making it more difficult for card issuers to identify less creditworthy applicants (Lee (2005)). In particular, some leading credit card issuers did not participate in the credit reporting system, fearing that sharing certain customer information would reduce their monopolistic rents of private information on their own client base.[2]

Fifth, various forms of principal-agent problems could also have aggravated information asymmetry and further distorted incentives to screen and monitor borrowers. Agency problems related to the unregulated, commission-based broker system arose in 2002–03. Moreover, Korean card issuers relied heavily on wholesale funding, particularly securitisation (see below), to support their business expansion and thus might have been eager to inflate the quality of the assets in their card portfolios (via re-ageing – ie the rollover of delinquent credit card debt) and push risky card loans off their balance sheets, repackaging them as marketable securities and selling them to less informed third-party investors (Moreno (2006), White (2007)) – a practice resembling that recently seen in the US subprime mortgage market, where responsibilities are segregated among different agents. Without proper

[2] However, a well-functioning information sharing system alone is no panacea, as demonstrated by the 2006 credit card crisis in Taiwan (China) and the ongoing subprime woes in the US mortgage market, where credit reporting and sharing systems are in principle well developed.

prudential and regulatory arrangements in place to ensure sufficient risk-sharing and transparency, the "originate-to-distribute" model might have weakened the incentives of Korean credit card companies to screen borrowers.

Finally, higher lending rates on a fast-growing, but not well-seasoned, credit card loan portfolio initially generated attractive net earnings, enticing new and existing card issuers to focus still more on the credit card lending business, thereby intensifying competition. The seasoning effect in credit card lending appears to be similar to that in corporate high-yield bonds, which tend to have low default rates in the years immediately after their issuance, when cash flows are favourable. Credit card issuers also tend to record much higher yields initially, unless they provide explicitly for possible future losses. In Korea, cash advance fees and interest charges exceeded 20 per cent, while unsecured personal loan rates at the time were only 6–7 per cent. During the credit card lending boom, the share of cash lending in total credit card assets approached 65 per cent. In 2001, the estimated returns on the credit card companies' assets were six times as much as the average returns of Korean commercial banks (Yun (2004)).

As a consequence, the composition of the cardholder base changed markedly, leading to bigger and higher-risk card lending portfolios. Typically, a disproportionate share of loans went to the least creditworthy borrowers, those most in need of unsecured lending. LG Card, a leading Korean issuer, found that 70 per cent of its bad loans came from accounts acquired during 2000–01, when the number of total credit cards in the economy more than doubled. On the basis of evidence from Korean income and expenditure surveys, Park (2008) shows that between 1999 and 2002, the average debt burden of asset-poor households rose much faster than that of other households. Much of this increased debt burden was presumably in the form of unsecured credit card debt.

The bust in 2003

The second phase of the credit card lending cycle began with the belated recognition, amid rising delinquencies, of excessive indebtedness and disproportional risk concentration. This resulted in greater caution on the part of the card issuers, tighter lending standards, credit contraction and prolonged balance sheet adjustments; these developments often affected the real economy.

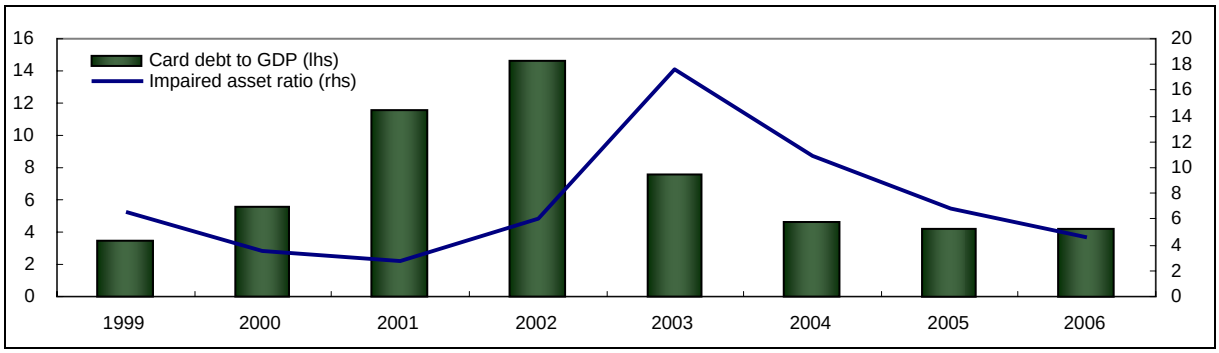
Although larger credit lines, the juggling of debt among various credit cards by borrowers with multiple cards, the re-ageing of card debt by issuers and, in some cases, the unloading of card loans via asset-backed securities (ABS) kept the lending boom going for a while, eventually some overstretched cardholders hit credit card limits. In addition, as credit card portfolios became more seasoned over time, delinquency and credit costs rose due to mounting provisions and charge-off expenses, which squeezed the issuers' cash flows and profit margins. Before long, card issuers sensed trouble and became more cautious in extending credit lines to riskier card borrowers. In some cases, they even cut lending to creditworthy borrowers, further tightening credit.

Tighter credit in turn further pushed up delinquencies, especially among overleveraged card borrowers, resulting in a kind of credit crunch, with credit contraction and deterioration in portfolio asset quality reinforcing each other. This adverse dynamic was reflected in both the rapid declines in outstanding credit card balances and the sharp spikes in the impaired asset ratio – ie the sum of delinquencies and charge-offs as a share of credit card receivables. Korea's impaired asset ratio approached 18 per cent at its peak (Graph 3).

Graph 3

Credit card distress in Korea

Credit card balances and non-performing credit card assets



[1] Ratio of total credit card receivables to GDP, in per cent. [2] Ratio of the sum of delinquencies (receivables three months overdue) and charge-offs (annualised) to average card receivables, in per cent.

Sources: Bank of Korea; Financial Supervisory Service of Korea; authors' own estimates.

The business model adopted by Korean credit card issuers also helped shape the particular dynamic of the credit card crisis, mainly because of the relationship between asset quality deterioration and funding difficulties (Graph 4). Specialised credit card service providers dominated the Korean market but were prevented by regulation from taking deposits. Thus, during the boom, monoline issuers funded the credit expansion by tapping heavily into the capital market, with much of the paper (debentures, commercial paper or credit card ABS) they issued being purchased by ITCs, insurance companies and pension funds. But as credit card lending portfolios began to sour, investors, spooked by an accounting scandal at SK Global in March 2003, rushed to pull their investments out of ITC-managed funds. Panic redemptions forced ITCs to sell even their government bondholdings, as liquidity in the secondary corporate bond markets disappeared (Remolona and Wooldridge (2003)). In a matter of two weeks, the value of the ITC-managed funds fell by 15 per cent. Most credit card companies found it almost impossible to roll over their maturing debts. Funding difficulties also forced some issuers that were either insolvent or in a liquidity crunch to slow or even cut their lending to cardholders, further pushing up delinquencies and undermining the confidence of bond investors. Heavy reliance on wholesale funding thus subjected Korean card issuers to the sudden seizing-up of financial markets and a liquidity crisis just at the time when the quality of the assets in their lending portfolios was deteriorating.

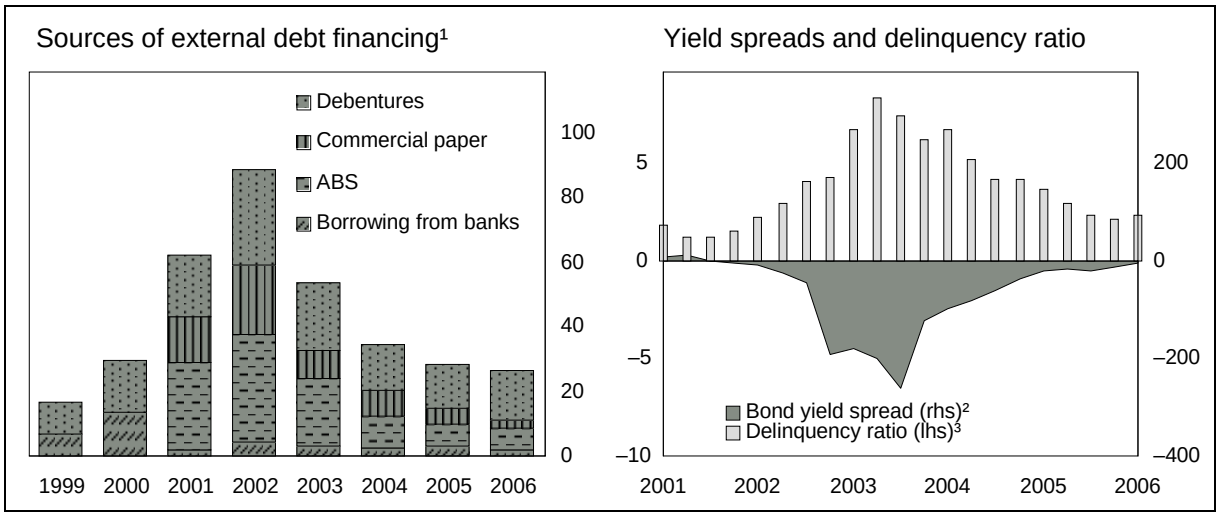
Initially, the Korean authorities tightened administrative and regulatory measures. Consultations between the regulators and credit card issuers over best practice guidelines for credit card operations and credit reference agencies were strengthened. First, the Korean authorities upgraded credit card asset classification standards, strengthened provision requirements and started applying prompt corrective action to standalone card issuers, They then raised the minimum capital adequacy ratio for card issuers to 8 per cent, from 7 per cent. The authorities also banned aggressive marketing practices, established a cap of less than 50 per cent of total credit card assets on cash lending, to be introduced by a specified deadline (the so-called "50 per cent rule"), and pressured credit card companies to lower their interest charges. While these measures are probably sound from a longer-term perspective or if deployed before a crisis occurs, in the shorter term some of them risk having additional contractionary effects, thereby exacerbating a credit crunch.

With the turmoil spreading to the bond market, policy interventions veered toward crisis management as policymakers became aware that systemic risks were increasing. Policymakers also changed their tactics over time. They intervened first by providing liquidity support to both the unsettled financial markets in general and to troubled credit card issuers

in particular, and second by arranging a rescue of the failing LG Card. These two interventions were large-scale operations.

Graph 4

The funding structure and asset quality of Korean credit card companies



¹ Year-end amount outstanding, in trillions of won. ² Benchmark corporate yields less credit card company bond yields, in basis points. ³ Three months overdue, in per cent.

Sources: Bank of Korea; Financial Supervisory Service of Korea.

First, within days of the mid-March 2003 bond market sell-off, the Bank of Korea injected substantial short-term liquidity – about KRW 4 trillion – into the system through open market operations such as reverse repos, outright purchases of government bonds and early redemption of Monetary Stabilisation Bonds. The government also persuaded domestic investors to roll over the matured debts of credit card companies and not to exercise their put options in credit card ABS.

Second, the government arranged a package through the state-owned Korean Development Bank (KDB) to rescue the troubled LG Card. The authorities initially pressured the majority shareholders of troubled credit card companies to inject capital into LG Card (on the order of KRW 4.6 trillion), then suspended the trading of LG Card bonds, arranged for the KDB to extend new credit to LG Card and, in 2004, coordinated a series of debt-equity swaps between LG Card on the one hand and many creditors on the other to ensure the joint control of LG Card by the creditor banks. At the peak of the crisis, KDB lending alone exceeded a quarter of total creditor claims – KRW 3.7 trillion – on LG Card.[3] The creditor banks eventually recorded an accounting profit of KRW 3 trillion from a debt-equity swap in March 2007 when Shinhan Bank acquired LG Card through a public takeover bid in the stock market. So, ex post, the rescue of LG Card did not cost taxpayers money. On the other hand, as public sector resources and implicit government guarantees were obviously involved up-front, KDB's involvement entailed an ex ante increase in the government's contingent liabilities. Therefore, the institutional support for LG Card could be viewed as a joint private-

[3] The KDB-led creditor committee seized management control of LG Card, replacing the chief executive officer and most of the senior management. During the restructuring of the company accomplished through debt-equity swaps, the entire equity of LG Card's majority shareholders was wiped out, while that of the minority shareholders was substantially written down, which should help contain the moral hazard risk.

public sector rescue characterised by a mixture of both bailout and bailin (Eichengreen and Ruehl (2000)).

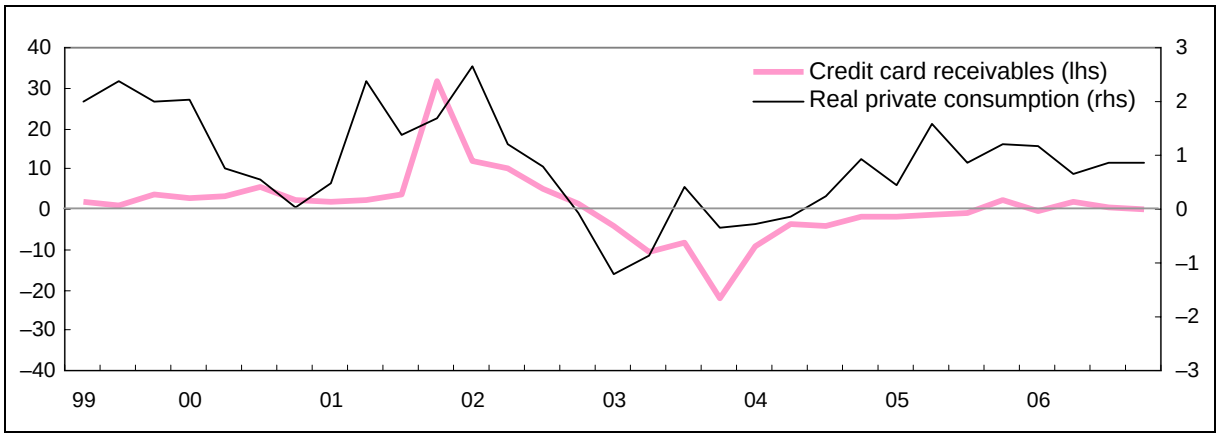
Meanwhile, regulatory forbearance of one form or another was exercised. The authorities reversed some earlier tough measures and allowed issuers to roll over delinquent credit card loans. This eased, at least temporarily, the burden of provisions and charge-offs on issuers, thereby also providing de facto regulatory forbearance. A credit counselling and recovery service programme was set up in October 2002 to facilitate debt rescheduling.

The effects of the credit card lending boom-bust on Korea's financial system were determined in part by the initial excesses of the boom and in part by the policy responses to the bust. Many leading issuers suffered heavy losses from their card lending business. It is estimated that about one third of the entire card lending book at its peak eventually had to be written off. Credit card balances for both bank and monoline issuers represented as much as one fifth of total bank loans outstanding at the peak of the boom. Moreover, commercial banks were themselves heavily exposed to monoline credit card issuers. As of March 2003, Korean commercial banks' lending to the troubled LG Card alone was KRW 11.2 trillion, or 38 per cent of the creditor banks' combined capital. The overall exposure of commercial banks to card issuers is estimated to have reached KRW 22 trillion on the eve of the credit card crisis (Park (2008)). Credit card debt distress spread to the broader financial markets, fuelling further disruption in Korea's financial system.

The rising number of delinquencies, in turn, began to have a negative impact on the real economy, mostly via weakened consumer spending. Deteriorating asset quality, funding difficulties and tougher regulations made the credit contraction worse, which clearly caused the private consumption downturn in 2003 (Graph 5). The unwinding of the excessive lending of the boom years was sometimes affected by, and in turn exacerbated, an ongoing business downturn. The economic downturn in late 2000 in the wake of the Asian financial crisis had been an adverse income shock that was still hampering households' ability to service their debts (Park (2008)). The turbulence in the corporate bond market following the credit crisis also indirectly contributed to a weakening in corporate capital spending that continued into 2004.

Graph 5

Credit card lending distress and consumption[1]



[1] Quarterly change, in trillions of won. Real private consumption is seasonally adjusted using quarterly data.

Sources: Bank of Korea; Financial Supervisory Service of Korea.

Lessons and policy implications

Two of the lessons learned from Korea's credit card crisis are worth highlighting. First, the Korean business model of monoline credit card operations based on wholesale funding resembles the originate-to-distribute model that has come under criticism during the recent subprime difficulties in the US mortgage market. In an environment characterised by easy credit and fierce competition, this model might have encouraged regulatory arbitrage and the relaxation of underwriting standards by Korean credit card companies. Prior to June 2003, there was no explicit regulation establishing the amount of capital credit card companies needed to set aside to cushion the contingent liabilities they incurred in relation to credit card receivables-backed securities. In addition, ABS allowed monoline credit card companies to get around a regulation barring them from issuing debentures (bonds) equal to more than 10 times their capital.

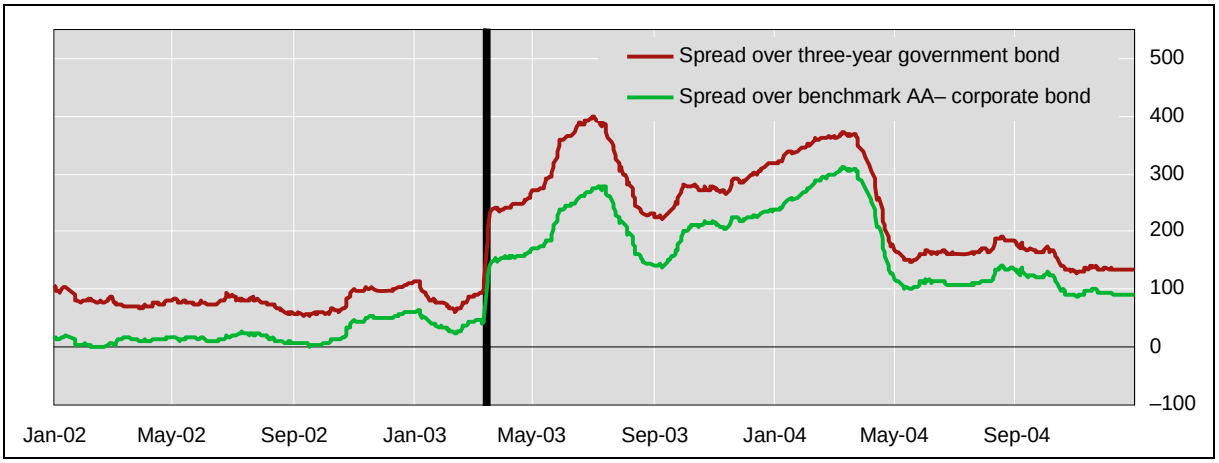
Furthermore, the credit card issuers' practice of re-ageing their loans inflated the quality of their assets and facilitated the transfer of credit risks to third-party securities investors, further reducing transparency and weakening incentives to screen and monitor card applicants. Re-ageing probably also delayed recognition of the problem and allowed excessive accumulation of risk during the lending boom. According to the estimates of the Financial Supervisory Service of Korea and Goldman Sachs (2003), re-aged loans might have accounted for as much as 30 per cent of the total assets of the top eight Korean credit card companies at the end of 2003.

A second and related lesson is that market discipline seems to have failed. Given that the credit card portfolio typically represented about 5 per cent of the total bank loan book, one might argue that yield spreads of bonds issued by commercial banks did not widen sufficiently or early enough to signal the rising underlying credit risk. Moreover, the Korean bond market failed to price such credit risks even as the quality of monoline issuers' portfolios deteriorated sharply, until the full crisis broke out in mid-March 2003. Between January 2002 and February 2003, the yield spread of credit card company bonds over three-year government bonds and benchmark corporate bonds with comparable ratings widened by less than 50 basis points (Graph 6).

Graph 6

Yield spread of credit card company bonds rated AA–

In basis points



Source: Korea Bond Pricing Incorporation.

This might have encouraged the credit card companies to continue aggressively expanding their balance sheets at a time when credit risk was already rapidly building up. The lack of effective market discipline as reflected in the mispricing of credit risk can be viewed as a particular case of market failure due to information asymmetry, which in turn might have been related to the regulatory authorities' belated disclosure of information about credit card companies to the public and authorisation of the practice of re-ageing debt as well as to the possibly opaque structure and excessive complexity of some ABS deals (Moreno (2006)). Finally, the failure of domestic rating agencies to promptly review the bonds and ABS issued by credit card companies certainly did not help.

The policy implications of Korea's experience with credit card lending distress may be valuable to policymakers in other Asian markets where credit card lending is starting to expand rapidly. First, the episode highlights the importance of placing greater emphasis on detecting early warning signs before the build-up of excessive imbalances has gone on for too long. Admittedly, it is a challenge to sound the alarm when profits are going up during a lending boom, but reasonable average debt-to-GDP or liability-to-asset ratios and low initial losses should not give rise to complacency. Even from a low base, rapid growth in indebtedness can overwhelm firms' risk management capacity and thus pose new risks, especially during periods marked by structural changes in the industry and/or the cardholding population. Nor should a benign economic environment lull us into ruling out the possibility of a consumer debt crisis. Moreover, given the time lags in data collection, problem recognition and the policy response, there is probably a need to strengthen the capacity of policymakers to conduct on-site examinations of banks and credit card companies and to maintain access to confidential information, particularly in the transition phase of market development.

Second, governments can enhance information flows to facilitate the functioning of the consumer credit market. For example, in order to mitigate information asymmetries between lenders and borrowers, credit information reporting and sharing should be encouraged (Miller (2003)). Credit reference agencies with a broad coverage of both the financial sector and types of credit data should in general help contain adverse selection problems, improve risk management capability, provide more reliable warning signals to regulators and permit more efficient product innovation and credit pricing. Enhancing information disclosure may also strengthen market discipline. Since 2003, credit information reporting and sharing in Korea have improved considerably, particularly with respect to the coverage of different types of credit data. Korea now has three private credit bureaus, which started collecting data in 2004.

Finally, policymakers may find it helpful to upgrade their prudential and supervisory frameworks, especially during the liberalisation process. These include both general regulatory rules as well as guidelines on best practice and prudential rules specific to the credit card business. For instance, there may be a case for more refined and differentiated provisioning requirements for credit card receivables: lending to regular revolvers is a higher-yield but riskier and more volatile business, while business from transactors has lower profit margins but is more stable. There should also be an explicit capital requirement to provide firms with a cushion against the retained exposure of, or the contingent liability arising from, off-balance sheet securitisation. A case can be made for imposing income tests, credit limits and minimum repayment requirements to cap risk exposure to the less than prime segment of the credit card market. Sometimes informally put in place through the bankers' association, some of these more "paternalistic" rules can be helpful safeguards, at least during the difficult transition periods of rapid structural change and financial liberalisation, but they need to be deployed pre-emptively or sufficiently early in order to enhance financial stability.

Conclusion

In sum, while the expanding credit card market offers vast business opportunities to the financial industry in an era of financial innovation and deepening, it is also subject to boom-bust cycles. Policymakers need to place greater emphasis on both identifying indicators of excessive credit growth and reacting to them.

References

Dell'Ariccia, G and R Marquez (2006): "Lending booms and lending standards", *Journal of Finance*, vol 61, no 5, October, pp 2511–46.

Eichengreen, B and C Ruehl (2000): "The bail-in problem: systematic goals, ad hoc means", *NBER Working Paper,* no 7653, April.

Evans, D S and R Schmalensee (2005): *Paying with plastic: the digital revolution in buying and borrowing*, 2nd edition, MIT Press.

Goldman Sachs (2003): "Korea – Specialty finance: credit cards", *Goldman Sachs Global Equity Research*, 7 April.

He, D, E Yao and K Li (2005): "The growth of consumer credit in Asia", *Hong Kong Monetary Authority Quarterly Bulletin*, March, pp 13–21.

Jeong, H (2006): "A study on the mechanism for sharing credit information", *Bank of Korea Economic Pap*ers, no 74, August.

Kang, T and G Ma (2007): "Recent episodes of credit card distress in Asia", *BIS Quarterly Review*, June, pp 55–68.

Lee, K (2005): "Risk in the credit card industry when consumer types are not observable", *Korea Development Institute School of Public Policy and Management Working Paper Series*, no 05-03, May.

Miller, M J (2003): *Credit reporting systems and the international economy*, MIT Press.

Moreno, R (2006): "The changing nature of risks facing banks", in "The banking system in emerging economies: how much progress has been made?" *BIS Papers,* no 28, pp 67–98, August.

Park, C (2008): *Consumer credit market in Korea since the economic crisis,* Chung-Ang University, mimeo.

Park, J and W Lee (2003): "Market discipline analysis in the credit card market", *Bank of Korea Monthly Bulletin*, September, pp 23-41 (in Korean).

Remolona, E and P Wooldridge (2003): "A depositor run in securities markets: the Korean experience", *BIS Quarterly Review*, June, p 10.

White, W R (2007): discussion of "The housing finance revolution", paper presented by R Green and S Wachter at the Federal Reserve Bank of Kansas City's Economic Symposium "Housing, housing finance and monetary policy", Jackson Hole, Wyoming, 29–31 September.

Yun, S (2004): "Impact of direct regulations on the Korean credit card market and consumer welfare", *Bank of Korea Economic Papers*, no 42, Seoul, August.

Household debt in Malaysia

Norhana Endut and Toh Geok Hua[1]

Introduction

An important development in the Malaysian financial sector since the 1997 Asian financial crisis has been the reduction in the banking institutions' credit exposure to businesses and the greater focus on household financing. In recent years, there has been a growing trend among corporations of securing longer-term financing, in larger amounts, from the capital markets. As the corporate sector turns to the capital markets to meet its financing needs, banking institutions are shifting their focus to the household sector as part of their business diversification strategy. The household segment accounted for one third of the banking sector's total loan exposure before the crisis; it now accounts for more than half.

With the shift towards high-volume, low-value loans, the banking sector has diversified credit risks and minimised the potential for large losses stemming from the failure of a few large borrowers. At the same time, as lending to households becomes a larger segment of the financial system, it is crucial for policymakers to be aware of the implications for monetary policy and financial stability. This paper briefly discusses the current development of household finance in Malaysia, its implications for monetary policy, financial stability and some of the policy issues it raises.

Key factors driving household credit

Macroeconomic stability, financial sector development and government policies have all played an important role in influencing the supply of and demand for mortgages and other household credit. Sustained economic growth in Malaysia, averaging 5.9% a year over the past six years, has raised household incomes and boosted consumer confidence, which, in turn, has induced optimistic expectations of future income. Furthermore, the low inflation rate, which averaged 2.2% a year during 2002–07, and low interest rate environment that has reduced the cost of borrowing have increased the incentive for households to borrow in order to smooth their desired path of consumption over the life cycle.

Progressive financial liberalisation, deregulation, financial sector consolidation and technological advances have also contributed to the growth in household credit. The emergence of a more diversified and competitive banking system has resulted in downward pressure on interest rates, expanded credit coverage and increased loan amounts, while the strengthened risk management of household credit portfolios has enabled financial institutions to lend more to households.

Government policies also have facilitated greater allocation of credit to households. In line with the government's efforts to promote home ownership, banks, based on their capacity and business strategy, are encouraged or required to offer housing loans, especially to low-income borrowers, and the government has announced a series of liberalisation measures

[1] The views expressed here are solely those of the authors and do not necessarily reflect the views of the Central Bank of Malaysia. The authors are from the Monetary Assessment and Strategy Department of the Central Bank of Malaysia.

and fiscal incentives for the property market. In terms of funding, a government-sponsored lending institution, Cagamas Berhad, plays a pivotal role in the housing market. Cagamas, a specialised secondary market institution, purchases or refinances mortgage loans from originators (mainly banks) to provide them with long-term funding. Besides these developments in the housing market, the streamlining and reduction of duties on cars have also boosted the demand for household credit.

Trends of household debt

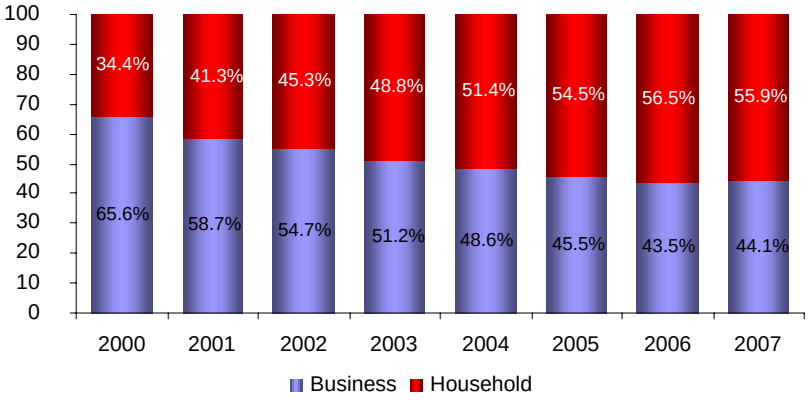
Level and growth rate of household debt

Prior to the 1997 Asian financial crisis, the share of household credit in total outstanding bank loans was relatively small compared to the share of loans extended to businesses. At end-1997, lending to the corporate sector accounted for 67% of total loans outstanding. But consumer financing has expanded considerably from 2000 onwards; the average annual growth rate for the period 2001–07 was 14.8% (Graphs 1 and 2). After six years of rapid growth, household debt grew at the more moderate pace of 7.9% in 2007, in line with the more subdued housing and automotive markets. As at end-2007, household credit accounted for 56% of total outstanding bank loans.

Graph 1

Breakdown of banking system loans

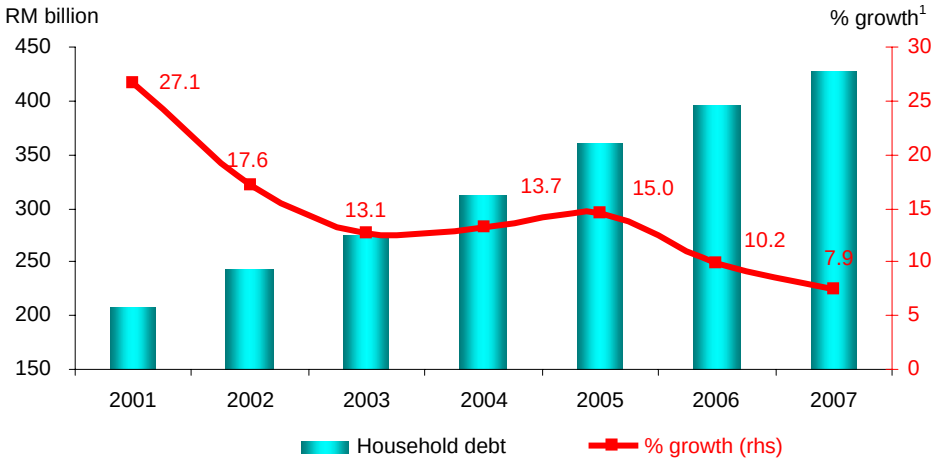
As a percentage of total loans



Source: Central Bank of Malaysia.

Graph 2

Household indebtedness



[1] Year-on-year change, in per cent.

Sources: Central Bank of Malaysia, Treasury Housing Loans Division.

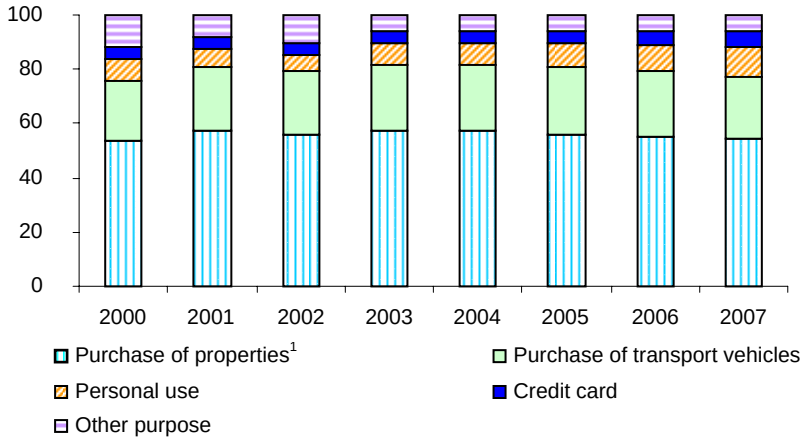
Composition of household debt

The composition of household debt changed little over the period 2000–07. The bulk was for house financing, which accounted for 55% of total household debt as at end-2007 (Graph 3). Total loans for housing purchases grew at an average annual rate of 15% during the period, in line with government efforts to promote home ownership. In addition, financial institutions have been willing to finance residential mortgages because such loans are typically viewed as low risk.

Graph 3

Composition of household debt by purpose

In per cent



[1] Includes residential and non-residential properties.

Sources: Central Bank of Malaysia, Treasury Housing Loans Division.

Loans for the purchase of passenger cars account for the second largest proportion of household debt. As at end-2007, car loans accounted for 23% of total household loans. Strong consumer demand for motor vehicles is attributed mainly to the revision of the tax

structure for passenger cars, new launches of mid-range passenger cars and the promotional activities undertaken by car companies to expand their sales.

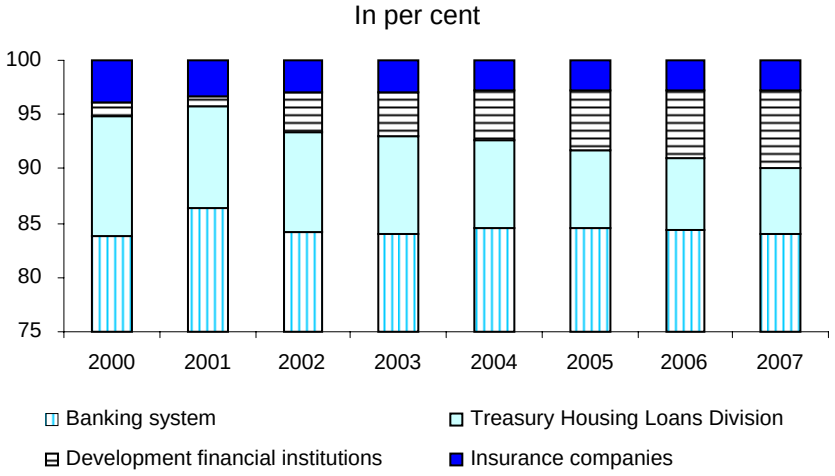
Financing via non-secured credit cards has been growing faster than mortgage lending, although the amounts are less significant. Reflecting the strong demand for consumer loans, coupled with aggressive marketing and advertising strategies by banks to attract customers, outstanding credit card loans grew by 17.8% a year, on average, over 2001–07. As at end-2007, credit card loans accounted for slightly more than 5% of total household debt.

Providers of household credit

The banking system, with its extensive branch network and increasingly flexible financing packages, is the largest provider of household credit in Malaysia, accounting for 84% of total household debt as at end-2007 (Graph 4). As the main mobiliser of funds in the Malaysian economy, the banking sector has been able to meet the increasing demand for financing arising from the growth in household consumption. It also reflected banking system increased dominance in lending to household sector due to the significant rebalancing of banking institutions' loan portfolios into the retail segment.

Graph 4

Composition of credit providers to household sector



Sources: Central Bank of Malaysia, Treasury Housing Loans Division.

The role of the development financial institutions (DFIs) is also growing. They overtook the Treasury Housing Loans Division as the second largest provider of household credit in 2007. DFIs' share of the market rose from a mere 1% in 2000 to 7.2% in 2007, mainly on account of increased lending for consumption and real estate purchases.

Types of loans and contracts

In general, banking institutions in Malaysia offer two types of mortgage loans, namely, conventional and Islamic. Conventional loans account for 90% of mortgages. Banks typically offer plain-vanilla mortgages at fixed or variable interest rates or a combination of the two. Approximately 83% of residential mortgages are variable rate mortgages, with adjustable rates pegged to the base lending rate (BLR) of individual institutions. In an increasingly competitive environment, banks also offer mortgage packages with repayment flexibility, such as graduated repayment schemes (lower initial instalment payments that increase gradually over time) and loans with longer maturities. Typically, housing loans have a repayment period ranging from 20 to 35 years or mature when the borrowers turn 60 or 65. It

is common for mortgages to carry fixed interest rates during the first three to five years and BLR-based rates subsequently, until maturity. This reflects the "sell-then-build"[2] concept of residential property development.

The products offered under Shariah-based Islamic house financing generally have the same characteristics as conventional mortgages but are based on the concept of *Bai' Bithaman Ajil* (BBA).[3] Islamic mortgages carry mainly fixed interest rates. However, banking institutions have begun to offer variable rate Islamic mortgages following a review of the BBA's variable rate financing mechanism conducted in November 2004 to promote efficiency in the pricing of this mode of financing. Accordingly, Islamic banking institutions are now allowed to determine a reasonable ceiling profit rate, taking into account their risk management, capabilities, business strategies and market outlook.

Housing finance agency

Cagamas Berhad, the National Mortgage Corporation, was established in 1986 to promote the secondary mortgage market in Malaysia. Its corporate mission is to provide financial products and services that improve the availability and affordability of home mortgages, particularly for lower-income households. Cagamas issues debt securities and uses the funds to finance the purchase of housing loans from banking institutions, selected corporations and the government. The provision of liquidity at a reasonable cost to the primary suppliers of housing loans encourages them to offer additional financing on affordable terms.

However, hedging instruments are relatively less attractive as risk management tools in Malaysia, where the financial sector has enjoyed ample liquidity since 1998. The opportunity cost of securitising or reallocating mortgage loans into bond market instruments may not be potentially higher vis-à-vis the potential returns from retaining the mortgages. Thus, although Cagamas provides an avenue for banking institutions to hedge against liquidity risk (with recourse) and credit risk (without recourse), the volume of mortgages that are sold to the agency and securitised remains relatively low. At end-2007, only 0.7% of the outstanding mortgages of the banking system were securitised, compared with 33.4% at end-1996.

Through its single-purpose and wholly owned subsidiary, Cagamas MBS Berhad (CMBS), in October 2004 Cagamas successfully issued Malaysia's first residential mortgage-backed securities (RMBS), which were backed by the government's staff housing loans.[4] This issue augured well for the development of a securitisation market in Malaysia. It is expected to create a yield curve for mortgage-backed securities and serve as a benchmark for other asset-backed securities. As at end-2007, CMBS securitisation activities involved a total of five issues of RMBS backed by the government's staff housing loans, of which two were based on the musyarakah principle.[5]

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[2] A potential homebuyer enters into a contract and makes an initial payment (10% of the sales price) when the sale and purchase agreement are signed. Subsequently, the buyer makes progress payments on the balance at different stages of construction.

[3] BBA refers to the sale of goods on a deferred-payment basis at a price that includes a profit margin agreed upon by both the buyer and the seller.

[4] The lender is the Treasury Housing Loans Division.

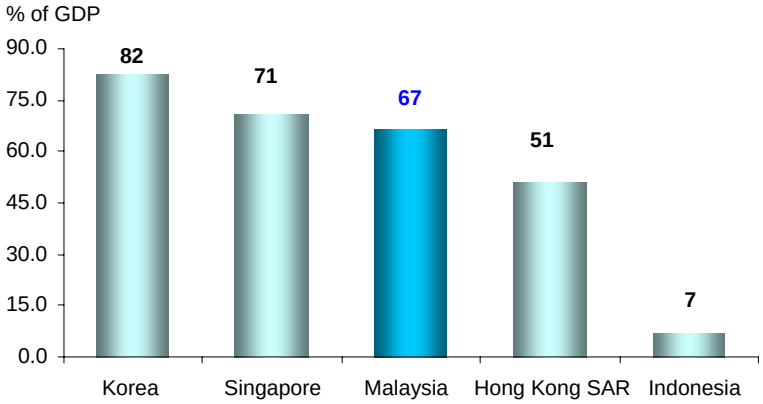
[5] The musyarakah principle refers to a partnership or joint venture for a specific business with a profit motive, whereby the profits are apportioned according to an agreed ratio. Both parties share any losses on the basis of their equity participation.

Financial vulnerabilities and household debt

As a result of heavy borrowing by Malaysian households, the ratio of household debt to GDP grew to 67% in 2007, from 47% in 2000 (Graph 5). As with most forms of credit, the rapid development of household debt can create vulnerabilities, in particular if the debt reaches an unsustainable level. However, the level of household indebtedness in Malaysia, which is comparable to that of other countries in the region, remains manageable. The risk to the financial system is limited, mainly because of the household sector's strong financial position and a resilient banking system. These have been enhanced by the Central Bank of Malaysia's adoption of a comprehensive approach to the preservation of financial stability. The approach encompasses surveillance at both the institutional and the systemic levels, the adoption of regulations to ensure prudent bank practices and supervisory activities.

Graph 5

Household debt to GDP ratio (2007)



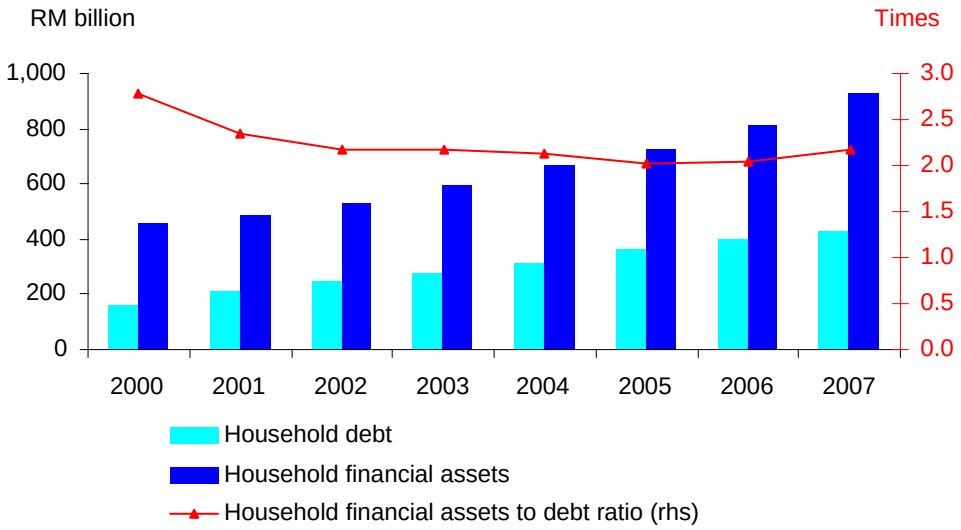
Sources: Central Bank of Malaysia, Financial Stability Reports of respective countries.

Strong financial position of households

Malaysia's household sector has demonstrated a great capacity to withstand shocks. In particular, net worth and income have grown broadly in tandem, supported by stable employment levels and a favourable economic environment. While their debt has grown rapidly, households have also accumulated sizeable financial assets. Since 2002, financial assets, which remain relatively stable at more than double household debt, have provided households with the flexibility to adjust to changes in the economic environment (Graph 6).

Graph 6

Household financial assets to debt ratio



Sources: Central Bank of Malaysia, Treasury Housing Loans Division, Employees Provident Fund, Securities Commission.

The very high level of the household sector's liquid assets underscores the sector's capacity to service its debt even in the short run. Indeed, during the first half of 2006, despite higher interest rates amid greater inflationary pressures, the debt servicing capacity of borrowers not only did not deteriorate but actually improved. The ratio of repayments to disposable income dropped to 39.8% in 2006, from 41.3% in 2005 and a high of 46% in 2002.

Equally important, the bulk of the increase in credit card balances did not involve cash advances. Credit card cash advances have been on a downward trend, accounting for 5.8% of total credit card transactions in 2007 (6.6% in 2004). Moreover, the repayment ratio[6] for credit cards –the average amount of debt is paid in full – rose slightly in 2007, to 58.4%, from 57.8% on average during 2000–06, indicating that credit cards continue to be used as a means of payment rather than as a mode of financing.

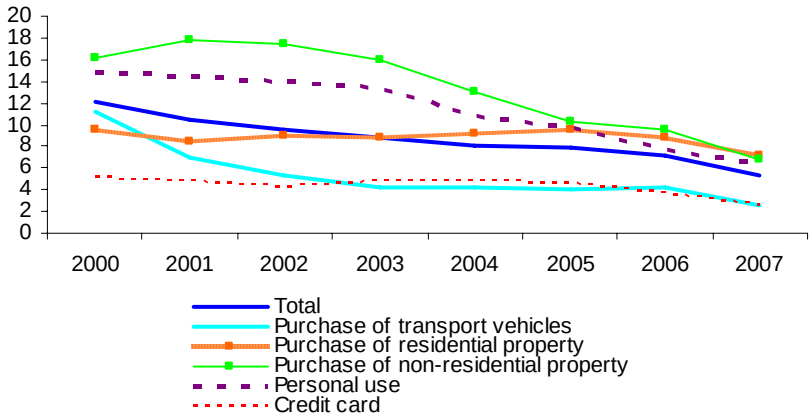
Overall, aggregate household non-performing loan ratios continued to trend downwards, to 5.3% in 2007 from a high of 12.1% in 2000 (Graph 7). Collectively, these indicators suggest that the vulnerability of household finances to adverse shocks continues to remain low.

[6] Repayment ratio = [(Total spending + cash advance) – outstanding balance]/(Total spending + cash advance).

Graph 7

Non-performing loan (NPL) ratio of household sector

In per cent



Source: Central Bank of Malaysia.

A more resilient banking sector

Banking institutions in Malaysia have made considerable progress since the 1997 Asian financial crisis. The strong capitalisation of the banking system was reflected in the risk-weighted capital ratio of 13% as at end-2007. In addition, banks have made great improvements in pricing borrowing risks, in particular, implementing substantial and comprehensive measures allowing them to gain a better understanding of household asset and debt portfolios. These measures include progressively strengthening risk management infrastructure and practices, such as retail credit scoring; improving information and portfolio management systems; and enhancing loan administration, monitoring, management and recovery processes.

Implications and policy issues

The developments in Malaysia's household finance markets have thus far supported the growth in private consumption and made positive contributions to other sectors in the economy. In addition, house prices have been relatively stable, with moderate increases driven by fundamental factors such as demographics and income growth. Nonetheless, policymakers will need to be vigilant as increased household indebtedness has important macroeconomic implications.

Increased indebtedness means that the household sector has more exposure to interest rate risks and shocks to household income and house prices. Households whose debt carries mostly floating interest rates are vulnerable to rising interest rates. Higher interest rates and the corresponding increases in debt servicing costs, in turn, result in a reduction in disposable income and, hence, consumption. The risks are more significant if households have taken advantage of low borrowing rates to increase the size of their mortgage excessively.

Monetary policy and the increased sensitivity of the household sector to interest rate changes

In principle, changes in monetary policy affect consumer behaviour through both interest rate and income channels. Higher indebtedness would, therefore, increase the sensitivity of households' behaviour to changes in interest rates, amplifying both effects. This argues for

incremental changes in the policy interest rate, particularly when structural changes in the economy and financial system create uncertainty about the monetary transmission mechanism. Smooth, steady changes in the policy rate, in turn, reinforce the importance of forward-looking monetary policy. Ultimately, concern over the impact of household debt from the perspective of monetary policy would be entirely in terms of the implications for growth and inflation.

The need for enhanced information on the household sector

The ability to detect and assess emerging vulnerabilities in the financial system arising from developments in household debt is critical, so as to allow appropriate policy measures to be implemented in a timely manner to contain such risks. Therefore, it is essential for policymakers to have timely and frequent data on the household sector. While aggregate information on household indebtedness and delinquency patterns is well established in Malaysia, micro level information such as household incomes, expenditures and wealth – in particular the distribution of wealth across various asset classes and income groups – are not readily available, are less comprehensive and of lower frequency and cover only a small sample of the population. Given the variations in the debt burden across income and occupational groups, actions such as changing the policy interest rate are likely to have different impacts on different households. Efforts are being made to enhance the collection of data on the financial assets and liabilities of a wider spectrum of households as well as to collect micro level data on the financial position of households.

The need to enhance the financial capability of consumers

The Central Bank of Malaysia's initiatives on consumer protection and education are aimed at empowering households to take responsibility for their own financial position. The strategies are two-pronged: strengthening the consumer protection regulatory infrastructure and enhancing consumer education. The Central Bank of Malaysia has undertaken efforts to educate consumers on financial management to enable them to make informed decisions and to manage financial risks in a proactive and constructive manner. In April 2006, the Central Bank of Malaysia established the Credit Counseling and Debt Management Agency to assist individuals seeking advice on credit, financial management and education and debt restructuring.

Prudential regulations and supervisory oversight

On the supervisory front, the Central Bank of Malaysia has conducted an industry-wide assessment of the adequacy, robustness and effectiveness of the banking sector's risk management infrastructure, standards and practices with respect to its exposure to households. The assessment covered governance, market conduct, product development, loan origination and underwriting processes, collateral valuation and management, portfolio management, loan maintenance and recovery and information management and reporting systems.

The Central Bank of Malaysia also established the Centralised Credit Reference Information System (CCRIS), which has provided banking institutions with valuable information, thereby enabling them to screen out non-viable borrowers. The CCRIS contains extensive information on the leverage position and quality of all borrowers in the banking system, regardless of the value and performance of the exposures. Efforts are being made to enhance the information content of the CCRIS to improve further the quality of financial institutions' credit assessment and risk modelling. From a financial stability perspective, the CCRIS provides important information for the conduct of surveillance – for example, the exposure of the banking sector to a particular borrower or industry and its quality.

Meanwhile, to enhance the existing capital adequacy framework, there is a need for differentiated treatment of different risk classes to take into account the risk profile of loan exposures. This would ensure that banking institutions maintain sufficient capital to support the expansion of financing for the household sector.

The financial surveillance framework is also continuously being enhanced, including through stress-testing the impact of a possible weakening of the household sector's financial position on both the banking system and individual institutions. Going forward, the challenges facing the Central Bank of Malaysia include ensuring that the scenarios in the stress tests are realistic and that the linkages among financial institutions are understood, and achieving a better understanding of the secondary impact of a potential weakening of the household sector's financial position on the economy and the feedback effect on the financial system.

Conclusion

From the financial stability perspective, as household lending continues to play an important role in the banking system, a more comprehensive and responsive risk management system is critical in preserving the soundness of each banking institution and the resilience of the banking sector as a whole. This is to ensure that banking institutions are able to effectively manage the risks at all times and under all economic conditions. In terms of monetary policy, when setting the policy rate it is imperative to take into account the increased potency of monetary policy as a result of the increased sensitivity of household consumption and debt servicing capability to interest rate changes.

Consumer credit in the Philippines

Winecito L Tan[1]

Retail banking in the Philippines is still nascent, with consumer loans accounting for only about 10% of total bank lending and less than 5% of GDP. That said, the consumption-driven nature of the economy creates strong demand for consumer loans, with personal expenditure making up 77% of GDP (Fitch Ratings (2006)). In response, the banks have recently focused aggressively on retail lending, which is experiencing growth rates of more than 10% per annum (albeit starting from a low base).

However, high delinquency rates have accompanied the growth of retail lending, especially unsecured lending, where overextension of credit to low-income earners has resulted in a non-performing loan (NPL) ratio of almost 20%. Concerned about a general lack of familiarity with consumer credit and the absence of a credit culture, the Philippine authorities have tightened the rules on credit card lending while pushing for the establishment of a credit bureau. Although consumer lending in the Philippines is at an early stage, it is important that banks manage its rapid growth with sound credit judgment to avoid the high NPL ratio they are experiencing in their corporate loan book.

An important determinant of consumer spending is access to credit by consumers through various lending institutions. These institutions include banks, credit and employee associations, social security agencies, cooperatives and other non-banks and informal institutions. However, data on consumer or household indebtedness are available only in reports on credit cards and real estate and auto loans extended by banks that are monitored regularly by the Bangko Sentral ng Pilipinas (BSP). All other data are either not easily accessible or not available in organised formats. Hence, the data used in this paper are limited to those found in the reports submitted by banks to the BSP.

Credit card loans

Credit cards provided by the banking industry are an emerging source of household credit in the Philippines. Based on the results of the nationwide "Consumer expectations survey" for the first quarter of 2008,[2] about 3% of the 5,000 sample household respondents have a credit card and around 4% expect that a household member will apply for a credit card within the next 12 months. This is lower than the proportion of respondents with bank accounts, which is 20% on average.

Based on the data in the banking sector's reports, the total credit card receivables (CCRs) outstanding of universal/commercial banks and thrift banks, inclusive of credit card subsidiaries, reached PHP 116.1 billion at end-December 2007. This represents an increase

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[1] The author is a staff member of the Department of Economic Statistics, Bangko Sentral ng Pilipinas (BSP). This paper was first presented at the Bank of Korea/Bank for International Settlements seminar, "Household debt: implications for monetary policy and financial stability", held in Seoul, Korea on 28 March 2008. The views presented in this paper are those of the author and do not necessarily reflect the position of the BSP. The author wishes to thank Ma Guonan of the BIS and Iluminada Sicat and Ludivinia Gador of the Department of Economic Statistics at the BSP for helpful suggestions and editorial assistance.

[2] The survey is conducted quarterly by the BSP.

of 9.5% quarter-on-quarter and 16.5% year-on-year. Relative to the country's GDP, the proportion of credit card loans has grown gradually, from 1.52% in 2005 to 1.75% in 2007.

Of the total CCRs, PHP 16.518 billion, or 14.2%, was past due as of December 2007, compared with 14.3% (PHP 15.199 billion) in the third quarter of 2007 (Graph 1 and Table 1), although total past-due receivables actually increased by 8.7% quarter-on-quarter and by 1.1% year-on-year. The improvement in the ratio was attributable to the expansion in total CCRs, which outpaced the increase in past-due CCRs.

In December 2007, past-due CCRs represented 12.5% of the total non-performing loans of both universal/commercial banks and thrift banks, which came to PHP 132.68 billion, compared with 10.4% in September 2007 and 9.5% in December 2006.

The trend in past-due CCRs could mean that more credit cardholders are having difficulties making their payments on time. Accounts that were more than six months (180 days) overdue came to PHP 6.858 billion – almost half (48.6%) of total past-due credit card receivables in June 2007.[3] However, total past-due CCRs were decreasing gradually from their peak of PHP 10.426 billion in December 2005.

The rate of consumer credit defaults in the Philippines is almost triple the average in Asia (Malaya (2008)). Despite the risky market for credit cards, there is still intense competition among credit cards and personal loan providers. Interest rates have continued to slide, but credit card rates have been slow in adjusting to market forces as can be observed in the big gap between prevailing benchmark lending interest rates and the effective rates on credit card loans (Graph 2). On average, consumers end up paying a 3.5% rate per month, or 42% per annum, including the basic interest rate, fees and charges, although the weighted average lending rate of commercial banks ranged from only 9.84% per annum in the first quarter of 2006 to 8.6% in the fourth quarter of 2007. The current monthly interest rate of Citibank, for example, is 3.25% with an annual fee of PHP 2,500, while that of HSBC is 3.5%. Credit card interest rates in the Philippines are currently among the highest in the world. The regulations for non-bank financial institutions do not impose any ceilings on the rate of interest, including commissions, premiums, fees and other charges on loan transactions, regardless of maturity and whether the loan is secured or unsecured.

In effect, good borrowers are shouldering a significant portion of the premium on bad debts since, given the lack of credit data that would permit lenders to determine the quality of borrowers, high interest rates are levied on all credit card debt. The absence of credit bureaus impedes the provision of sound consumer debt data that would include, among other things, information on the creditworthiness of borrowers. Screening out borrowers with poor credit scores could reduce the default ratio to a low single digit and eventually lower average interest rates. Meanwhile, consumer groups are requesting that credit card issuers cap their annual rates at 18 to 20% or risk legislative intervention, amid intensifying lobbying for cheaper credit card loans.

The rules and regulations of the BSP that govern the credit card operations of the banks and subsidiary credit card companies are not enough to screen out delinquent borrowers. As a prudential measure to protect banks and subsidiary credit card companies, the BSP requires these institutions to set up an appropriate system for managing their risk exposures to credit card operations and to document these exposures in a complete and concise manner. Before issuing credit cards, banks and their subsidiary credit card companies must exercise due diligence by ascertaining that applicants have a good credit standing and are financially capable of fulfilling their credit commitments.

[3] In the Philippines, loans that are six months overdue are considered bad debts, as defined in Subsection X136.1 of the BSP's *Manual of Regulations for Banks*.

At the same time, the BSP also ensures that the rights of consumers are protected in accordance with the section in the Consumer Act of the Philippines that covers consumer credit transactions with banks and other financial intermediaries.

Auto loans

As of end-December 2007, the automobile loans of universal/commercial banks and thrift banks reached PHP 86.2 billion (Table 1 and Graph 3), 3.8% higher than in the previous quarter and 19.4% higher than at end-December 2006, but trailing CCRs, which totalled PHP 116 billion, by PHP 29.8 billion.

Meanwhile, the share of auto loans in the total loan portfolio dropped to 4.1% in the fourth quarter of 2007, from 4.3% in the previous quarter. The ratio of past-due auto loans to total auto loans was maintained at 5.1% in the fourth quarter of 2007, little changed from the third quarter, as the 3.3% climb in past-due auto loans to PHP 4.4 billion nearly matched the growth in total auto loans. Nonetheless, the ratio was slightly lower in the first quarter of 2008 than in the first quarter of 2007 (5.2%), as the 17.6% hike in past-due auto loans was offset by the expansion in total auto loans outstanding. Meanwhile, the ratio of past-due auto loans to non-performing loans stood at 3.3% in the fourth quarter of 2007, compared with 2.9% in the previous quarter and 2.2% in the fourth quarter of 2006.

From March 2006 to December 2007, the ratio of past-due auto loans to total auto loans ranged from 4.69 to 5.17%, whereas the ratio of past-due CCRs to total CCRs for the same period ranged from 13.83 to 19.98%. The ratio of past-due auto loans to total auto loans indicates that auto loans have a much lower risk of default than credit card loans. The less risky environment in the car loan market allows auto distributors to offer an interest rate of 0% for up to 18 months on auto loans, in contrast with the very high interest rate on credit card loans. This could be due to the fact that auto loans are secured, with the car itself serving as collateral. By contrast, credit card loans are unsecured and tend to attract borrowers of lower quality. If the difference in risk is the reason rates are much higher on credit card loans than on car loans, regulators need to find an appropriate policy response in order to lower the risk in the credit card market, such as enhancing credit information and tightening rules on income requirements.

Housing loans

Housing loans are considered to be relatively less risky due to their collateralised nature (Fitch Ratings (2006)). Moreover, the Philippine government extends housing loans to households under its National Shelter Program, which is aimed at addressing the country's chronic housing shortage. While the BSP imposes a 20% overall limit on banks' real estate lending, to prevent universal/commercial banks from concentrating too heavily on commercial lending, it excludes from this prudential safeguard housing loans to individual households as well as loans extended to real estate developers for the construction of socialised and low-cost residential properties under various government housing programs. These loans, however, are subject to strict underwriting standards and prescribed limits on loan amounts relative to the value of the collateral.

Data provided by BSP-monitored banks on real estate loans granted for the acquisition of individual unit residential properties are readily available. Housing loans granted in 2007 totalled PHP 106.48 billion, compared with PHP 94.69 billion in December 2006, a year-on-year increase of 12.5%. The amount of past-due loans increased at a faster rate, however – 15.6% year-on-year. The level of past-due housing loans is slightly higher than that of auto

loans, but the ratio of past-due loans to total loans is almost the same – 5% – in both markets.

Bank data exclude housing loans provided by government agencies, mostly to low-income groups. The state-controlled Home Development Mutual Fund (Pag-IBIG Fund), one of the leading government financial institutions in the Philippines and the biggest financier of the government's housing programs, granted a total of PHP 23.5 billion worth of housing loans in 2007, compared with PHP 16.09 billion in 2006. The Pag-IBIG Fund can provide financing for low-cost housing units at an interest rate of 6–7% for a term of up to 30 years. The average housing loan in 2007 was PHP 475,000.

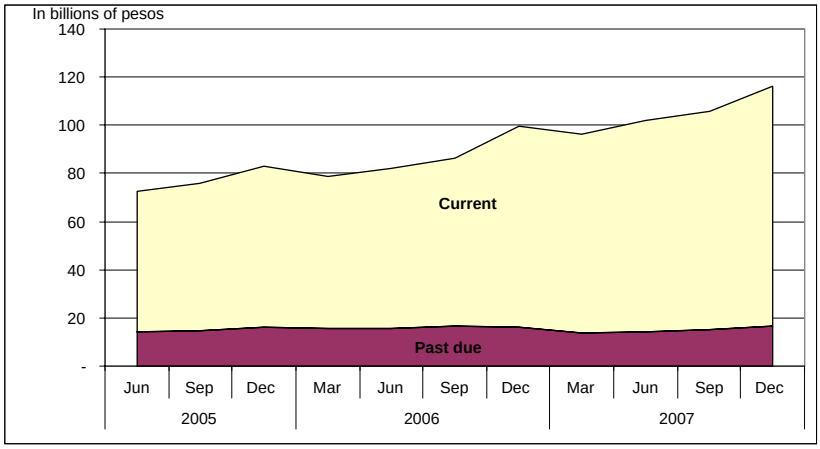
Consumer credit data gap: some measures

The loans discussed in this paper are only some of the many forms of credit available to consumers in the Philippines, including consumer loans provided by informal institutions, social security agencies, cooperatives, employee associations and non-banks. However, we are unable to discuss these other forms of consumer credit in this paper due to a serious dearth of data. In this regard, the BSP continues to lobby for the establishment of a central credit information system so as to improve discipline in the credit markets. The proposed credit bureau would be a reliable source of information allowing lenders to accurately evaluate risks and distinguish between creditworthy and poor-quality borrowers.

Another BSP initiative that addresses the data gap is the Consumer Finance Survey, which aims to generate, measure and analyse data on the wealth, indebtedness, savings and investments of Philippine households. At present, the BSP is completing a pilot consumer finance survey, and it will soon be conducting the full-scale survey in selected regions. This is one of the initiatives that could shed more light on the role of consumer credit in the development of the Philippines and in elevating the well-being of its people.

Graph 1

Credit card receivables of universal and commercial and thrift banks

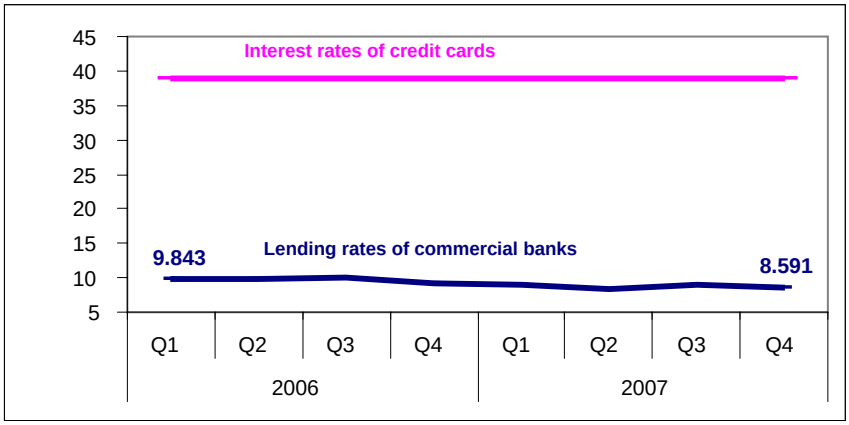


Source: Bangko Sentral ng Pilipinas.

Graph 2

Weighted annual average lending rates of commercial banks and credit card interest rates

In per cent



Graph 3

Current and past-due auto loans and ratio of past-due auto loans to total auto loans

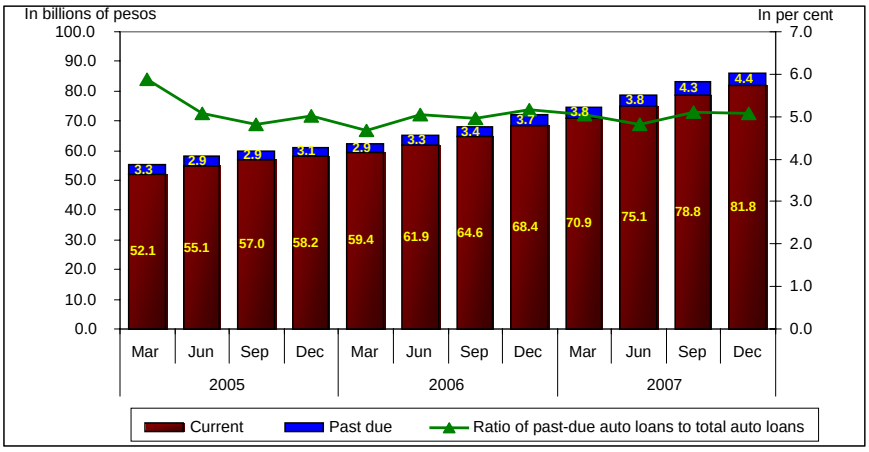


Table 1

Consumer loans of universal and commercial and thrift banks and subsidiaries

In billions of pesos

	2006				2007			
	March	**June**	**Sep-tember**	**Decem-ber**	**March**	**June**	**Sep-tember**	**Decem-ber**
Total loan portfolio (net of IBL)	1,758.33	1,815.71	1,848.11	1,931.69	1,925.23	1,886.71	1,915.54	2,130.06
Credit card receivables	**78.835**	**81.921**	**86.464**	**99.619**	**96.426**	**102.04**	**106.034**	**116.102**
Current	63.084	66.203	69.783	83.282	82.72	87.922	90.832	99.581
Past due	15.751	15.718	16.68	16.337	13.706	14.114	15.198	16.517
1–180 days	1.586	6.252	6.98	6.571	6.64	7.256	7.717	8.608
Over 180 days	9.974	9.466	9.7	9.766	7.066	6.858	7.481	7.909
Non-performing loans	191.53	184.11	185.8	171.96	154.67	151.62	145.98	132.68
Ratio of past-due CCRs to non-performing loans (in per cent)	8.22	8.54	8.98	9.5	8.86	9.31	10.41	12.45
Ratio of past-due CCRs to total CCRs (in per cent)	19.98	19.19	19.29	16.40	14.21	13.83	14.33	14.23
Total auto loans	**62.30**	**65.17**	**67.98**	**72.17**	**74.71**	**78.89**	**83.04**	**86.19**
Current	59.38	61.88	64.60	68.44	70.94	75.08	78.79	81.80
Past due	2.92	3.29	3.37	3.73	3.77	3.81	4.25	4.39
Non-performing loans	191.53	184.11	185.80	171.96	154.67	151.62	145.98	132.68
Ratio of past-due auto loans to non-performing loans (in per cent)	1.53	1.79	1.82	2.17	2.44	2.52	2.91	3.31
Ratio of past-due auto loans to total auto loans (in per cent)	4.69	5.04	4.96	5.17	5.05	4.83	5.11	5.09
Total housing loans	**78.34**	**82.49**	**86.35**	**94.69**	**97.17**	**99.18**	**101.90**	**106.48**
Current	74.09	78.28	82.10	90.06	92.69	94.80	97.18	101.13
Past due	4.25	4.21	4.24	4.63	4.49	4.39	4.73	5.35

References

Bangko Sentral ng Pilipinas (2003): "Circular no 398", *Series of 2003,* 21 August, www.bsp.gov.ph/regulations/regulations.asp?type=1&id=251.

——— (2005): *Manual of regulations for banks*, December: www.bsp.gov.ph//regulations/reg_MORB.asp.

——— (2007): *Handbook on consumer laws covering BSP-supervised financial institutions,* vol 1, pp 3–6, www.bsp.gov.ph/downloads/regulations/consumerlaws.pdf.

Daquiz, M S R (2007): "On credit purchases reach P96.4 billion" *Business World Research*, 5 September, www.bworldonline.com/Research/economicindicators.php?id=0129.

Estayo, M (2008): "Consumer credit defaults in RP triple the Asian rate", *Malaya Business,* 17 April.

Fitch Ratings (2006): *Managing growth – the challenge of consumer lending in Asia,* Hong Kong SAR, 7 March.

Household indebtedness in Sweden and implications for financial stability – the use of household-level data

Mattias Persson[1]

Trends in household indebtedness in Europe

Household borrowing has increased considerably in a number of countries over the past two decades, both in absolute terms and relative to household income (see CGFS (2006), BSC (2007), Girouard et al (2007) and Warnock and Warnock (2007)). Two factors that have probably been important in the increase in indebtedness are financial deregulation, which has decreased the level of credit rationing, and lower interest rates, in both nominal and real terms. These two factors, combined with such other factors as an overall benign economic environment and demographic pressures, can probably go a long way towards explaining the rapid growth in household indebtedness in Europe. At present, aggregate household indebtedness in Sweden is slightly over 70% of GDP, nearly double the level in 1970. The upward trend in household indebtedness in Sweden during the last decade parallels that of many other European countries (see Graphs 1 and 2). While the general upward trend is clear, notwithstanding a few exceptions such as Germany, it is also worth noting that there are significant differences in the level of household indebtedness among the surveyed countries. These differences are, of course, due to differences in owner occupancy rates, but differences in national housing finance markets also play an important role.

The increases in household indebtedness and house prices have been even more noticeable in many central and eastern European (CEE) economies where lending growth has been well into the double digits for several years (see Graph 3). This rapid growth is due largely to the catch-up process, as these countries have made the transition from command economies to market economies with deregulated financial markets. This development holds great promise for the general population of the CEE countries but has also added a score of new challenges for central bankers and supervisors with respect to financial stability. One challenge is how to separate transitional effects from cyclical effects and determine what a sustainable rate of credit growth would be over the medium term. Another challenge is that the banking system in many of the CEE countries is either owned or controlled by parent banks situated in countries in Western Europe. This means that the authorities must learn to adjust to a situation where cross-border banking has become the rule, rather than the exception.

Overall, the developments in household indebtedness mirror the developments in house prices, as the bulk of the debts taken on by the household sector have been channelled towards the purchase of housing. The surge in house prices during the last decade is more or less a worldwide phenomenon, although house price increases have been more pronounced in some countries than in others (see Graph 4). These differences are likely to have been caused by the same drivers that explain differences in household indebtedness in addition to other factors, such as the prevalence of a speculative "buy-to-let" market or

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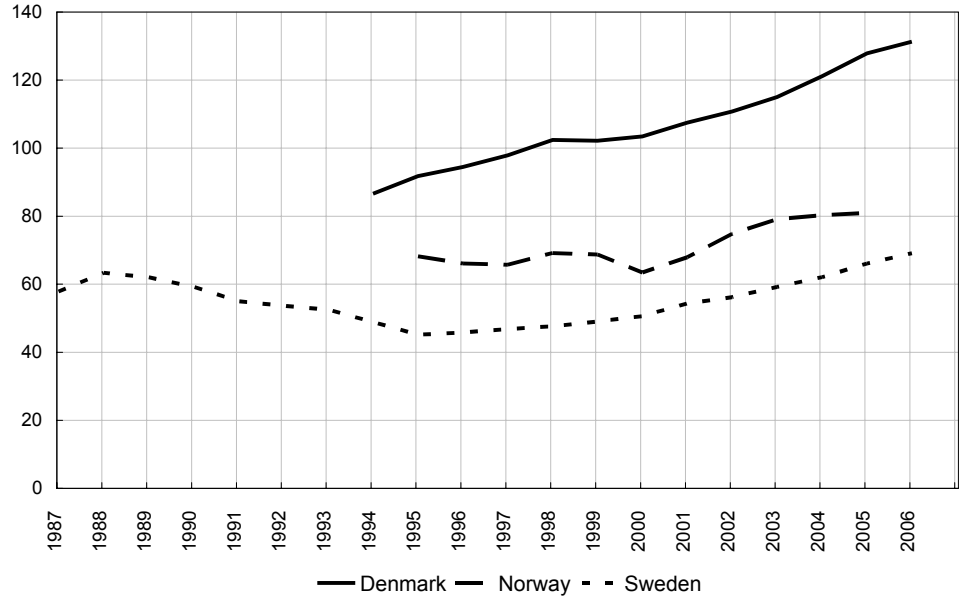
foreign demand for domestic housing. However, there are now clear signs that global house price inflation is moderating. Increases in house prices have slackened recently in several countries and are even falling in others.

Graph 1

Household liabilities as a share of GDP

In per cent

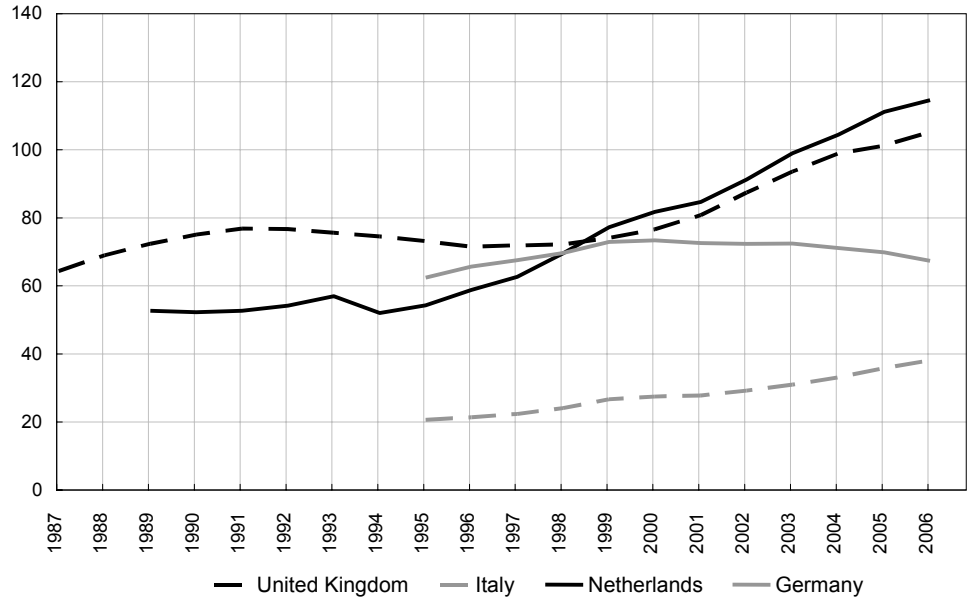


Source: Eurostat.

Graph 2

Household liabilities as a share of GDP

In per cent

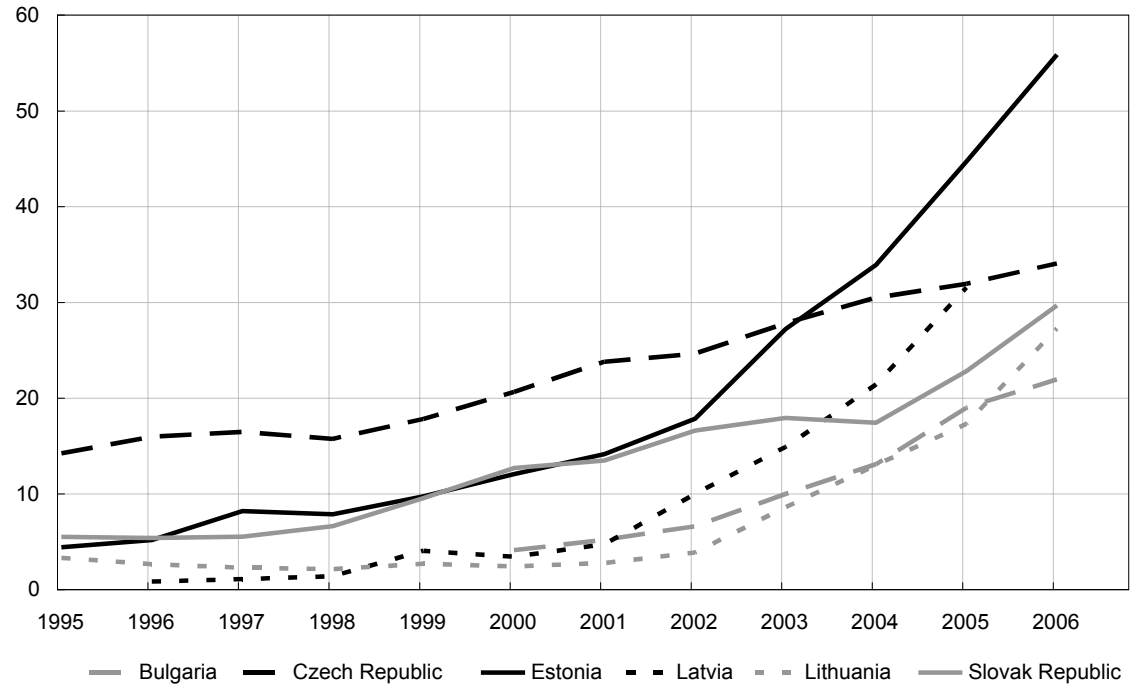


Source: Eurostat.

Graph 3

Household liabilities as a share of GDP

In per cent

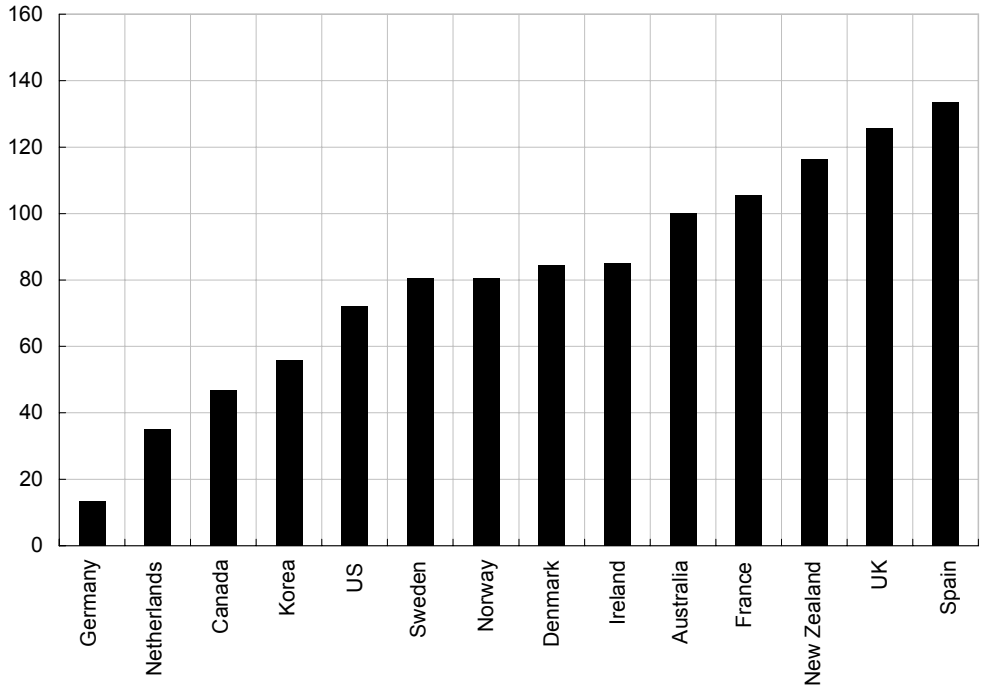


Source: Eurostat.

Graph 4

Change in nominal house prices, 2000–07

In per cent



Source: Reuters EcoWin.

The case for micro data

The increase in household indebtedness has raised concerns about housing finance-related credit risk and the stability of the financial system, particularly if interest rates or unemployment were to rise. That adverse developments in the mortgage sector can have far-reaching consequences for financial stability has been amply illustrated by events in the United States. These events also show the need for central banks and supervisors to continuously follow developments in the mortgage market.

So far, no consensus has emerged on the best way to monitor and assess the risks to financial stability posed by the housing finance markets. Many agree, however, that it is important to collect data that allow for a more granular or differentiated analysis of household indebtedness. Evaluating potential financial stability risks emanating from housing finance markets is difficult if one relies exclusively on aggregate data from the financial and national accounts, as such data do not provide information regarding the distribution and matching of debt and interest expenditures and income. From a financial stability perspective, this suggests that more detailed data regarding individual households (so-called micro level data), may reveal pockets of vulnerabilities in the household sector.

Using micro data – the case of Sweden

By the mid-2000s, household indebtedness in Sweden was increasing rapidly towards the levels seen at the onset of Sweden's banking crisis in 1992 (see Graph 5). This was, of course, a source of concern and, given the inherent limitations of aggregate data, it was quickly recognised that in order to assess potential threats to systemic stability, more granular data were needed. This was the motivation for the Riksbank's decision to start working with micro data. In its current analysis of the household sector the Riksbank uses two micro datasets. The first is a smaller cross-sectional dataset that is a recurring item in the Riksbank's *Financial Stability Reports.* The second is a much larger panel dataset used for more in-depth analysis when it is necessary to follow the same household over time.

Cross-sectional data

The cross-sectional dataset is compiled by Statistics Sweden, the Swedish government's statistical agency, and is obtained from an annual survey of the Swedish household sector. It covers income, debt and wealth and contains more than 1,000 socio-economic variables for around 20,000 households (40,000 individuals). The dataset is based on administrative information collected from government bodies responsible for income transfers and taxation. Each household in the survey is assigned a weight that corresponds to the number of households in the population that it represents. This allows us to aggregate the micro data in order to compare them with data from either the national or the financial accounts.

While the survey offers very detailed insights into the economy of the household sector, it suffers from the obvious publication lags. Statistics Sweden prepares a preliminary version of the survey about 11 months after the end of the year. This version is not available to the public and does not include any data on household wealth. The final version of the survey, which is released a few months later, contains data on household wealth. In addition, the sample from the preliminary survey is altered to better match the population.

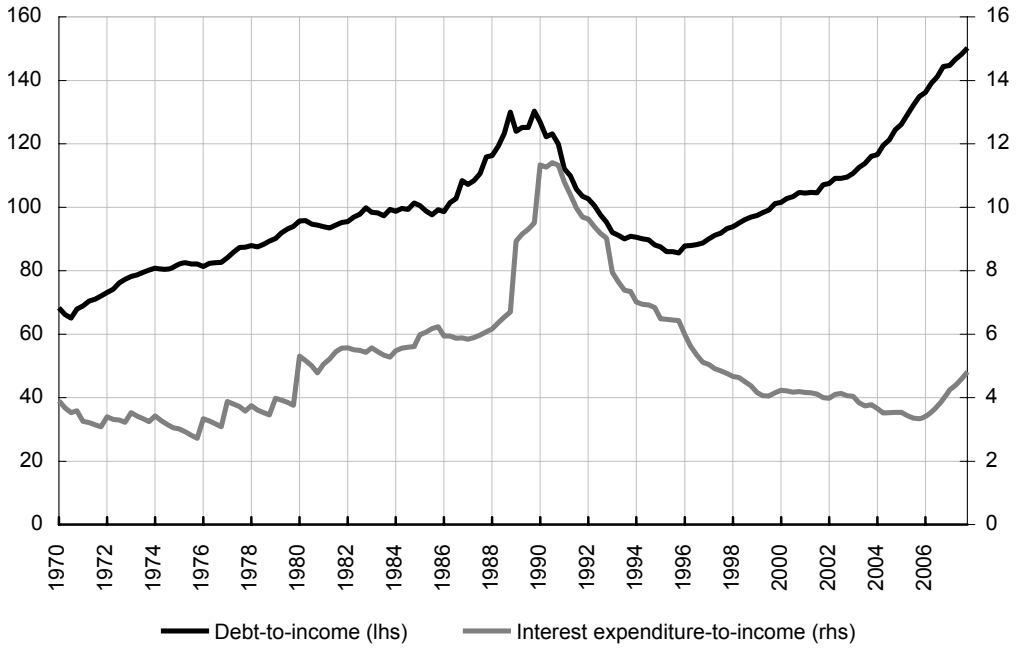
Another limitation is that the survey includes only household assets, liabilities and income that are reported to the authorities. In practice, this means that the survey underestimates disposable income since wages from the informal sector are excluded. It is also likely that the value of household assets is 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, because interest payments are tax-deductible. Moreover, real assets are basically defined as real estate, ignoring assets such as jewellery, furs and cars. In sum, the household sector is in all likelihood better off financially than the survey indicates.

Graph 5

Ratio of debt and interest expenditures to disposable income

In per cent



Source: Statistics Sweden.

The distribution of income, interest expenditures, assets and liabilities

One rough measure of the risks in household lending is the distribution of household debts across income categories, the notion being that the smaller the share of debts held by households with lower incomes, the lower the risks associated with household lending. Clearly, if the lower-income groups hold a very small share of total household debt, this could indicate the presence of binding credit constraints, which, in general, impose welfare costs on society. Hence, a heavily skewed debt distribution (towards high-income earners) is not necessarily benign.

To analyse the distribution of debt, income, wealth and households' ability to meet their debt payments, the household sector is divided by disposable income into five equally large categories. The ultimate purpose of the analysis is to find pockets of vulnerability that, under stress, may translate into credit losses in the banking sector. Households that do not hold any debt, and hence pose no risk of causing bank losses, are excluded from the analysis. Thus we study only the indebted households within each income category. As shown in Table 1, high disposable income, high indebtedness and large assets tend to go hand in hand. Reassuringly, 55% of total household debt is held by the highest income quintile (Income Category 5). The household sector also seems to have sufficient collateral to back its liabilities, as can be seen in the assets-to-debt ratios in Table 1.

Table 1

Descriptive statistics from 2005

Income category[1]	1	2	3	4	5
In thousands of Swedish kronor[2]					
Disposable income	76	136	196	293	484
Financial wealth	119	90	166	269	675
Real wealth	365	488	662	1,111	2,777
In per cent					
Debt-to-income ratio	205	120	144	161	192
Post-tax interest-to-income ratio	3.5	3.3	3.9	4.4	5.1
Assets-to-debt ratio	314	359	293	293	300
Share of total debt	3	5	12	25	55

[1] Income Category 1 consists of the households with the lowest incomes; Income Category 5, the highest. [2] SEK 1 = KRW 145.

Sources: Sveriges Riksbank; Statistics Sweden.

A more through investigation of the dataset shows that differences can be quite large within income categories as well. Income Category 1, the quintile with the lowest income, is the most heterogeneous of the five. It is difficult to generalise about this group, since it consists of individuals with very different characteristics and living situations. The statistics show that a major proportion of the households in this quintile do not have employment, income, assets or liabilities. Moreover, as can be seen in Table 1, the mean disposable income in this income category is quite low, and many households would find it hard to make ends meet on such a low income. Hence, there is reason to be sceptical about the quality of the data in the lowest income category.

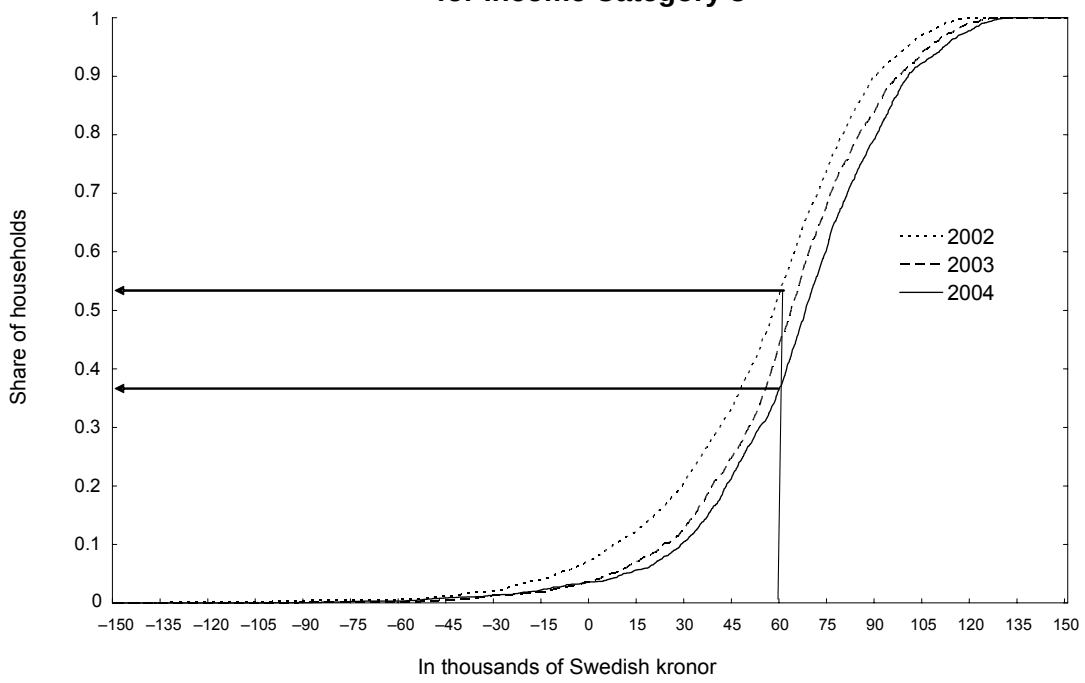
The financial margin

A different "ability to pay" measure that is increasingly being used by central banks is the absolute buffer or financial margin available to a household after it has serviced its debt and paid its living costs (see eg Johansson and Persson (2006), Magyar Nemzeti Bank (2007) and Zajączkowski and Żochowski (2007)). A household with a margin of less than zero would find it hard to make ends meet and therefore might default on its debts.

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 Graph 6). This gives an indication of how many households in each income category are below the margin and how close the other households are to it. In Graph 6 we plot the cumulative distribution of the households' margins for Income Category 3 for the years 2002, 2003 and 2004. Graph 6 should be interpreted as follows: in 2002, about 53% of the households in Income Category 3 had an annual margin of not more than SEK 60,000. In 2004, this share had decreased to 37%. Thus, the households in Income Category 3 have significantly strengthened their financial positions between 2002 and 2004. By moving the vertical line (the one at SEK 60,000 in Graph 6) to the left or right, one quickly gets an idea of how sensitive the households in each income category are to changes in income and costs.

Graph 6

Distribution of household margins for Income Category 3



Source: Statistics Sweden.

However, as the ultimate goal is to monitor potential credit losses in the banking sector, it does not suffice to just calculate the proportion of households that lie below the margin without taking into account their share of the total debt of the household sector ("exposure at default", EAD) and the value of the assets that can be used to cover losses incurred by a default ("loss given default", LGD). If a large proportion of the household sector lacks a financial cushion but holds very little debt, the aggregate risk associated with household lending is small. Finally, to gauge the potential losses that banks would incur were the vulnerable households to default, one can calculate the net worth – ie assets minus liabilities – of the vulnerable households. If the net worth of a household is larger than zero it does not matter whether the household defaults, since the credit loss would still be zero. The Riksbank found that even if the vulnerable households were to default on their debts, a majority of debts would be covered by collateral and hence losses would remain limited.

In Table 2, we calculate the proportion of households with negative margins and the EAD and LGD within each income category. The second column lists the proportion of indebted (vulnerable) households per income category that lie below the margin. The next column shows the vulnerable households' share of total household debt (EAD). The last column shows the debts held by households below the margin in each category that are not covered by assets as a share of total household debt (LGD). For example, in Income Category 2, 6.1% of all indebted households have a margin that is less than zero. These 6.1%, in turn, hold 1.0% 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 defaulting households that would not be covered by assets amounts to 0.09% of the total debt held by the household sector. If one repeats the exercise for all the indebted households, one arrives at the following conclusion: 6.3% of all the indebted households in the survey have negative margins and thus, at least technically, run the risk of defaulting on their debt. Together, these households hold 5.6% of total household debt. If they were to default, creditors would suffer losses corresponding to 0.9% of total household debts. This figure is substantially lower than actual

credit losses as reported by banks. This supports our suspicion, raised above, that households – especially those in the first income category – have incomes and assets that are not recorded in the survey.

Table 2

Proportion of vulnerable households, EAD and LGD in 2005

In per cent

Income category	Vulnerable households per category	EAD as a share of total household debt	LGD as a share of total household debt
1	66.87	2.28	0.57
2	6.10	1.06	0.09
3	1.98	0.83	0.09
4	0.61	0.74	0.08
5	0.04	0.05	0.01
Total	**7.35**	**4.98**	**0.83**

Sources: Sveriges Riksbank; Statistics Sweden.

One of the main benefits of working with an absolute financial margin is that it offers a transparent framework that can be used to stress-test the household sector. The Riksbank continuously performs stress tests to investigate the effects on potential credit losses of a variety of adverse macroeconomic scenarios. In general, the Riksbank found that credit losses from household lending can be expected to be low, even in the face of an adverse macroeconomic development. Moreover, credit losses are found to be more responsive to changes in interest rates than to unemployment. One explanation for this is the composition of household debt and income. Household debt is, by and large, concentrated in the highest income category. These households often consist of two employed adults and hence have two incomes. Thus, even if one individual in the household becomes unemployed, the other individual's income, together with unemployment benefits, is usually enough to cover living costs and interest payments.

Brief comparison with other countries

While central banks increasingly are relying on micro data in their analysis of the household sector, unfortunately no consensus has emerged on how to report the results. This, in concert with the obvious differences in data definitions and coverage, means that it is hard to compare results. Given these caveats it is still worth making such comparisons. In the process of writing this paper, I came across three countries whose central banks, like the Riksbank, have calculated the share of debt held by different income categories.

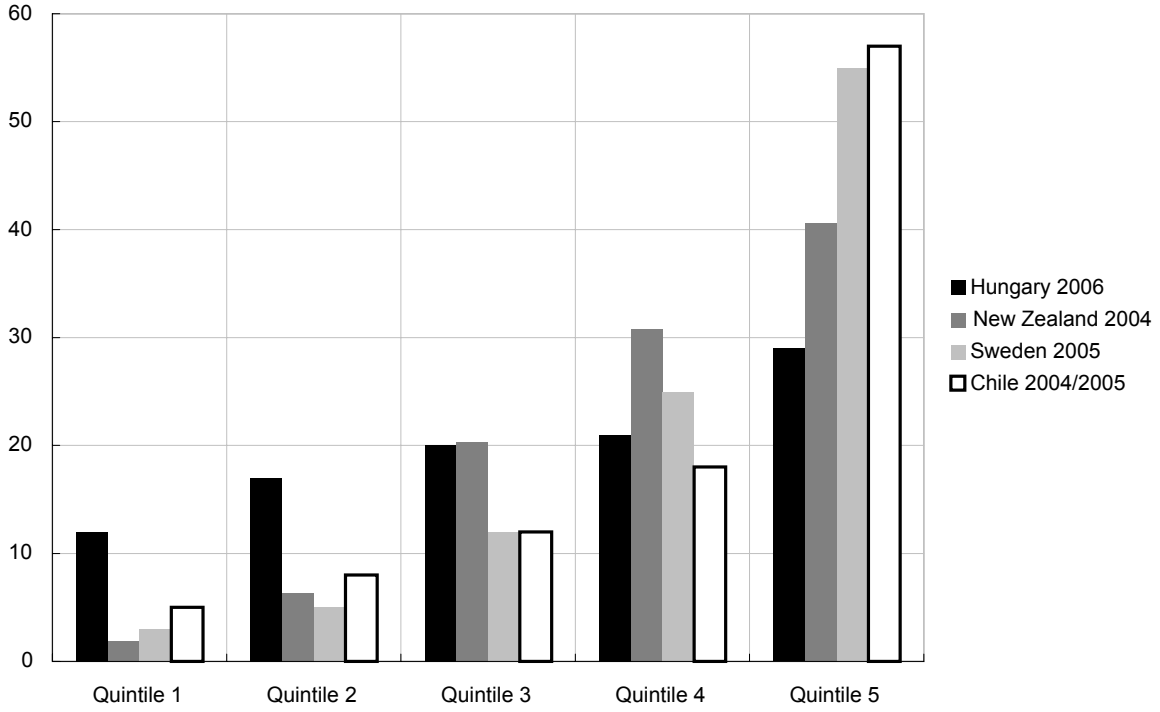
As can be clearly seen in Graph 7, which plots the distribution of debts across income quintiles in four countries, the higher income echelons hold the largest share of household debt in all the surveyed countries. Nonetheless, Graph 7 also tells us that there are some surprising differences between countries. The countries that have the most uneven debt distribution are Sweden and Chile. Given that Sweden has one of the most even income distributions in the world, an educated guess would be that debt distribution also would be even. This is not the case, however, as indicated by Graph 7. This is consistent with the

findings of a report by the Committee on Global Financial Stability (CGFS (2006)) that concluded that institutional setups and other aspects of public policy are important determinants of the characteristics of household indebtedness in various countries.

Graph 7

The share of debt held by different income quintiles

In per cent



The results should first and foremost be seen as indicative, since differences in definitions make exact comparisons difficult.

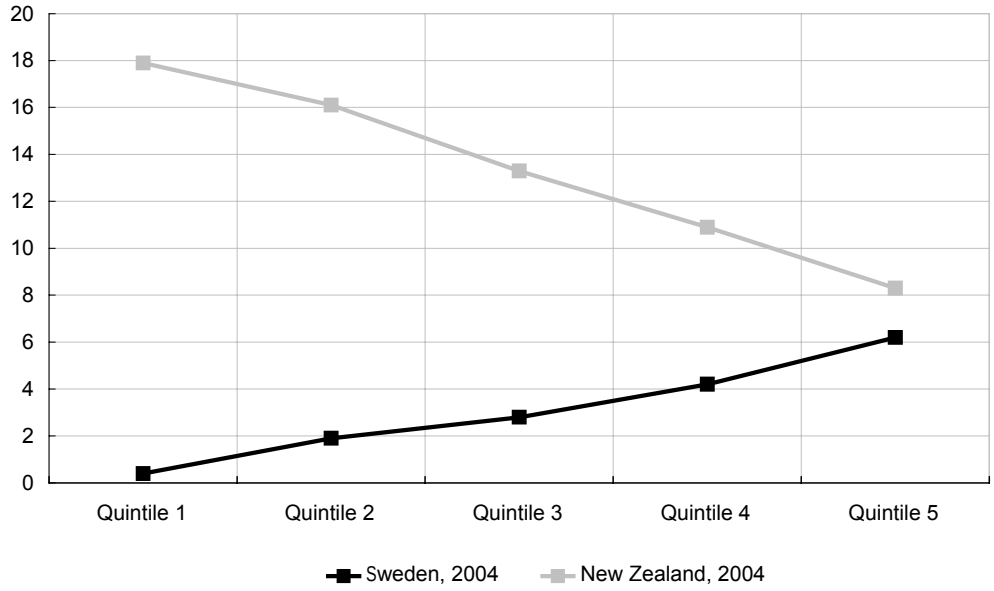
Sources: Cox et al (2006); Magyar Nemzeti Bank (2007); Reserve Bank of New Zealand (2006); Sveriges Riksbank; Statistics Sweden.

Another metric for measuring the risk in the household sector that was explored in Table 1 is the share of income that different income quintiles in Sweden devote to interest expenditures. Interestingly, the Reserve Bank of New Zealand also computed this metric in its 2006 *Financial Stability Report* (see Graph 8). What is striking is the lack of similarity between the two countries. First of all, the average ratio of interest to disposable income is lower in Sweden than in New Zealand. One reason for this is, obviously, that mortgage rates were substantially higher in New Zealand than in Sweden in 2004. More puzzling, however, are the different slopes of the two lines – the interest ratio rises as income rises in Sweden, while the opposite happens in New Zealand. Since households in the highest income quintiles in Sweden and New Zealand devote roughly the same share of their income to interest expenditures, this suggests that wealthier households in Sweden and New Zealand are equally well equipped to handle rising interest rates, while economically weaker households are more at risk in New Zealand than in Sweden.

Graph 8

Ratio of interest to disposable income for different income quintiles

In per cent



The results should first and foremost be seen as indicative, since differences in definitions make exact comparisons difficult.

Sources: Reserve Bank of New Zealand (2006); Sveriges Riksbank; Statistics Sweden.

Panel data

Most empirical work on household borrowing and saving relies on surveys. However, to investigate cross-sectional differences in borrowing and saving it is preferable to follow households over time. In other words, we would like to have panel data rather than repeated cross-sections. Statistics Sweden provides a longitudinal dataset named LINDA that contains extensive and detailed information on economic and demographic variables for individuals. Demographic information includes age, gender, birthplace, nationality, etc. Each individual has an identification number as well as a household identification number. The economic information includes labour and capital income as well as public and private pension income. In addition, there is a detailed list of welfare transfers such as unemployment benefits, paternity and maternity allowances, student allowances and disability support. Detailed information on real and financial assets (also supplied by Statistics Sweden) is added to the LINDA data.

The household identification number makes it possible to group individuals at the family level and to construct household data. The LINDA and wealth data contain information on nearly 800,000 individuals each year. Using these data, we construct around 300,000 households; the head of household is defined as the member with the highest disposable income. The obvious advantage of using the LINDA dataset is that we can follow the same household over time. The disadvantage, compared with the data from the smaller survey described above, is that households are defined slightly differently under the LINDA dataset: since unmarried childless couples are considered to be two separate households, the LINDA dataset overestimates the number of single-member households.

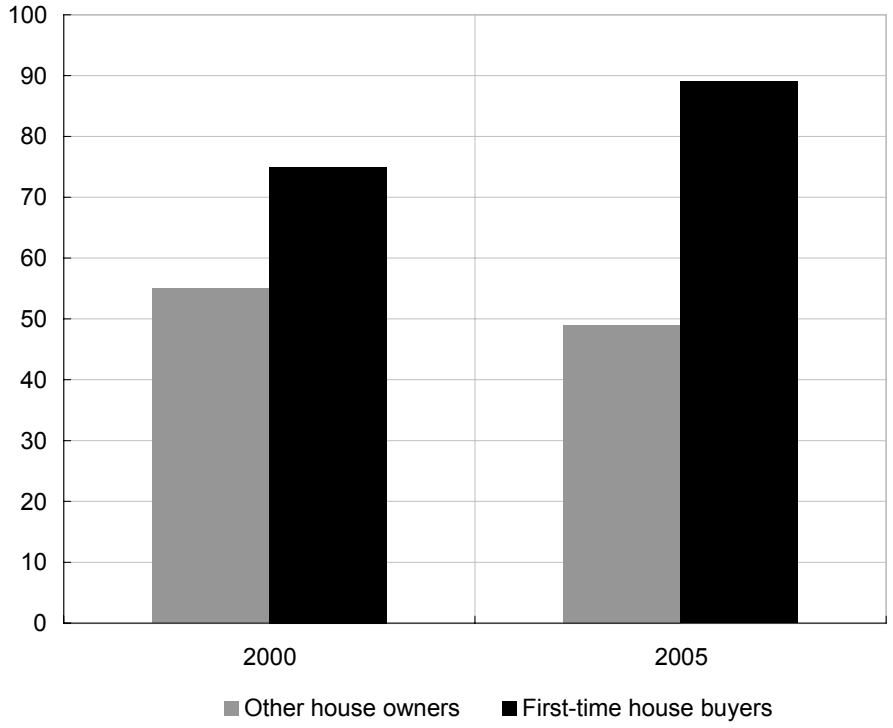
The LINDA and wealth data have been used to study the loan–to-value ratio for first-time homebuyers and other homeowners between 2000 and 2005. The results show that the loan-to-value ratio declined for the majority of households but rose rapidly for first-time

buyers. A comparison shows that the percentage of first-time buyers rose from 2% of households in 2000 to 4% in 2005. At the same time, the loan-to-value ratio also rose for first-time buyers, from 75% in 2000 to 89% in 2005 (see Graph 9). This means that the risks increased significantly for households that entered the housing market at a later stage. However, first-time homebuyers account for a very small percentage of homeowners. More than 95% of the households who own their own homes have done so for at least two years and have seen a drop in their loan-to-value ratio.

Graph 9

Households' loan-to-value ratio

In per cent



Sources: Sveriges Riksbank; Statistics Sweden.

Summary and concluding remarks

Household borrowing has increased considerably in the past few years in many advanced economies, raising questions about the vulnerability of the household and banking sectors. In this paper we have reviewed the Riksbank's work with micro data in analysing households' assets, liabilities and ability to pay. One important conclusion is that the majority of housing loans are held by high-income households, which also own the bulk of real and financial assets. The most vulnerable households – those that have no financial cushion for unexpected expenses – are largely debt-free. Heavily indebted individual households could run into problems servicing their debts. This is especially true for first-time homebuyers who are highly indebted. We also compared, to the best of our abilities, the debt situation of households in Sweden with that in other countries. In general we found not only similarities but also some surprising differences, which could provide an incentive for more central banks to undertake a micro analysis of the household sector.

Our analysis also illustrates that having access to data and statistics on developments in the housing finance market and household sector is important in analysing not only the risks to financial stability stemming from the indebtedness of the household sector but also the impact of growth in the housing finance markets on the monetary policy transmission mechanism. Since housing finance markets in Asia have grown over the last couple of years, central banks and other authorities will need better data on the housing market and on the balance sheets of individual households in order to assess fully developments in the housing and housing finance markets.

References

Banking Supervision Committee of the European System of Central Banks (2007): "EU banks' exposure to residential property markets", *EU banking sector stability,* European Central Bank, Frankfurt, 14 November, pp 38–56.

Committee on the Global Financial System (2006): "Housing finance in the global financial market", *CGFS publications,* no 26, Basel, January.

Cox, P, E Parrado and J Ruiz-Tagle (2006): "The distribution of assets, debt and income among Chilean households", *Central Bank of Chile Working Papers,* no 388, Santiago, December.

Girouard N, M Kennedy and C André (2007): "Has the rise in debt made households more vulnerable?" *OECD Working Papers,* no 535, 3 January.

Johansson, M W and M Persson (2006): "Swedish households' indebtedness and ability to pay – a household level study", *Sveriges Riksbank Economic Review*, no 3, 18 December, pp 24–41, www.riksbank.se/templates/Page.aspx?id=23488.

Magyar Nemzeti Bank (2007): *Report on Financial Stability*, Budapest, April.

Reserve Bank of New Zealand (2006): *Financial Stability Report*, Wellington, May.

Warnock, V C and F E Warnock (2007): "Markets and housing finance", *NBER Working Papers,* no 13081, May.

Zajączkowski, S and D Żochowski (2007): "Housing loans growth, foreign currency risk and supervisory response: the Polish case", 7 November, www.nbp.pl/Konferencje/NBP_Nov2007/Speakers/Zochowski.pdf.

Household sector and monetary policy implications: Thailand's recent experience

Tientip Subhanij[1]

Introduction

Monitoring house price inflation and the build-up of household debt is important for the conduct of Thailand's monetary policy. Although the Bank of Thailand (BOT) does not directly take into account the level of household debt or house price movements when it decides to change short-term interest rates, it recognises that changes in the policy rate could strongly affect house prices, household borrowing and overall consumption.

A reduction in the policy rate could lead to an unsustainable increase in debt, thereby raising the risk of undershooting the target inflation rate in the future. At times of easy monetary policy, a rise in both household disposable income and housing prices could encourage households to consume more and build up debt. A boom in house prices could be of great concern to policymakers because it might enable households to increase their consumption by betting on higher expected future incomes, which could affect economic stability.

Higher debt levels could make things substantially worse if there is a shock to the economy and people are unable to get their loans renewed. If they become unemployed and cannot obtain loans, they will significantly reduce consumption because they will be, or will have the prospect of being, unable to service their debts. In the face of excessive debt, tighter monetary policy could induce greater precautionary saving and a larger drop in consumption.

It is hard to predict whether higher debt levels would lead to a significant additional cutback in consumption that would not respond to an easing of monetary policy. The impact would depend primarily on the structure of the household sector, the ability of households to service debt, the availability of credit and financing conditions.

This paper attempts to examine the above issues by looking at the structure of household balance sheets, the build-up of household debt and the roles of housing prices and housing finance in Thailand. The BOT's monetary policy stance since the adoption of an inflation targeting framework is also discussed in order to provide some perspective on the linkages between monetary policy and the household sector. In the following sections of this paper, we discuss Thailand's monetary policy framework, the relevant literature, current conditions in Thailand's household sector, current consumption and household debt, housing prices and mortgage financing and the role of monetary policy and housing price movements in explaining output fluctuations. We present our conclusions in the final section.

Thailand's current monetary policy strategy

It may be useful to begin by putting the BOT's current monetary policy strategy into perspective. The development of Thailand's monetary policy framework can be divided into three periods. First, from the end of World War II to June 1997, Thailand had a pegged

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exchange rate regime. During this time the baht was pegged to gold, the US dollar or a basket of currencies. The peg to a basket of currencies was in place from November 1984 to June 1997. Under the pegged exchange rate regime, the Exchange Equalization Fund (EEF) would announce and defend the baht's value against the US dollar daily.

However, with the speculative attack on the baht at the onset of the Asian financial crisis, the peg was abandoned and the baht allowed to float on 2 July 1997. The BOT adopted a monetary targeting regime deemed to be consistent with the move to a managed float. The monetary targeting regime was in place until May 2000. During this time Thailand received financial assistance from the IMF, and the BOT targeted the domestic money supply by setting the daily and quarterly monetary base targets.

The third period began on May 23, 2000 when the BOT announced the adoption of an inflation targeting regime, which is still in place today as Thailand's monetary policy framework. The BOT switched to inflation targeting because the relationship between the money supply and output growth had become less stable.

There are four dimensions to Thailand's current monetary policy formulation under the inflation targeting regime:

1. The Monetary Policy Committee (MPC) sets out monetary policy in order to attain price stability conducive to sustainable economic growth. With its most recent *Inflation Report,* the MPC also began to monitor factors contributing to external stability and financial imbalances.

2. The monetary policy instrument used by the MPC as the key policy rate to signal the monetary policy stance is the one-day repurchase rate (RP).

3. The MPC's policy target is core inflation (excluding raw food and energy) of between 0 and 3.5% (quarterly average). In the event the target is missed, the MPC is required to explain the reasons to the public.

4. The BOT has developed a macroeconomic model to forecast economic conditions and the inflation outlook.

Under the inflation targeting regime, one of the most critical responsibilities of the BOT is the achievement of price stability. Indeed, since the adoption of inflation targeting in 2000, the BOT has never once missed its core inflation target (see Graph 1). Before the current regime was adopted, core and headline inflation appeared to track each other, with their means relatively close. Core inflation was chosen as the target due to its lower volatility (Table 1).

However, given that increases in oil and food prices are no longer a temporary phenomenon, core and headline inflation appear to be diverging more than before, and so the target for inflation is now under review.

Despite its stated objective of targeting inflation, the BOT also monitors financial imbalances that may bring instability to the Thai economy. In each of its meetings, the MPC considers seven areas where financial imbalances could occur: the household sector, the real estate sector, external stability, financial institutions, the financial status of the corporate sector, financial markets and government finance and public debt.

Table 1

Development of core and headline inflation

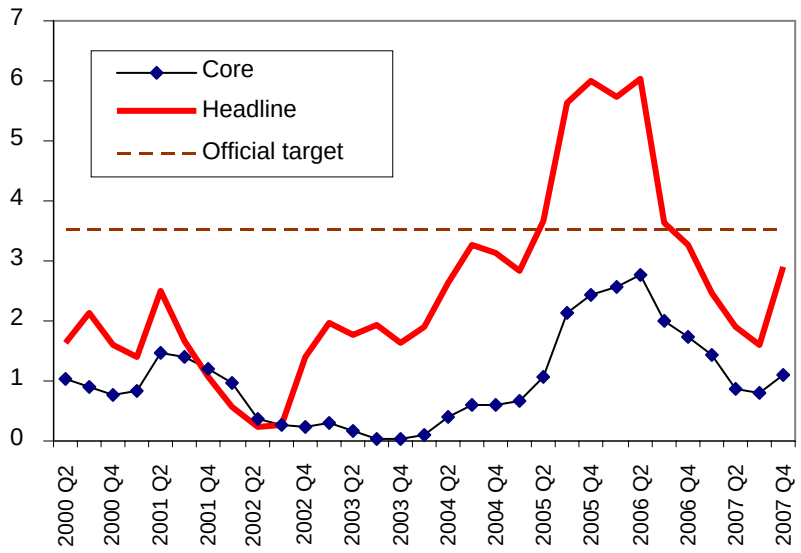
In per cent	Before inflating targeting		After inflation targeting	
	Q1 1986–Q1 2000		Q2 2000–Q4 2007	
	Headline	Core	Headline	Core
Mean	4.66	4.59	2.52	1.01
Standard deviation	2.17	1.68	1.56	0.77

Source: Author's estimates.

Graph 1

Core versus headline inflation

In per cent



Source: Bank of Thailand.

The BOT recognises that booms and busts in asset prices, especially housing prices, should be seen as part of a broader set of symptoms that normally also include a build-up of debt. During an upswing, household balance sheets may look healthy as the appreciation in asset values offsets the build-up of debt. But if the prevailing mood is one of pessimism, rather than optimism, leading to a correction in asset valuations and a sharp deterioration in net worth, financial distress may result. The MPC therefore takes account of various indicators of financial imbalances in making decisions about interest rates.

Relevant literature

The life cycle hypothesis of saving and consumption, first developed by Modigliani and Brumberg (1954) and later augmented by Ando and Modigliani (1963), stated that all sources of an increase in wealth, whether from stocks, real estate or any other assets, should have the same positive effect on household consumption.

However, it has been argued that the consumption effect of changes in housing wealth should be larger than that of changes in other assets, such as stocks, because housing wealth is held by a larger proportion of households. Since only rich people have excess savings to invest in the stock market and since the marginal propensity to consume out of wealth is lower for the rich, as economic theory and empirical evidence suggest (Lusardi (1996), Souleles (1999)), then changes in housing wealth might have a larger effect on consumption than changes in stock market wealth. Moreover, because house prices are much less volatile than stock prices, changes in housing wealth might be viewed as much longer-lasting than changes in stock market wealth, another reason that housing wealth should have a greater effect on consumption.

Given that some households might be credit-constrained, the existence of additional credit channels that work through effects on housing prices may be quite significant. Credit-constrained households are affected by current cash flows – that is, by the difference between income and expenses. When short-term rates or a variable rate on a mortgage increase, households will have higher interest payments and reduced cash flow.

One of the reasons households become credit-constrained is the problem of asymmetric information in the credit market, ie adverse selection and moral hazard problems. For this reason, collateral is used to reduce these information problems. Good collateral can decrease lenders' losses if borrowers default and reduces the incentives for borrowers to take on excessive risk because they have something to lose.

Given the importance of collateral in reducing the problem of asymmetric information in the credit market, where residential mortgages are readily available to homeowners, then a rise in house prices enhances the value of the collateral for the homeowner. This in turn improves both the amount and the terms of credit available to homeowners. This situation can also be expressed in terms of the financial accelerator framework of Bernanke and Gertler (1995) and Bernanke et al (1999). According to this theory, higher house prices reduce the gap between the default-free interest rate and the effective interest rate facing the homeowner, the so-called external finance premium. A rise in house prices, which improves a household's balance sheet, then leads to a decline in the external finance premium or effective cost of borrowing.

Higher house prices can also have the effect of relaxing credit constraints. When house prices rise, homeowners have additional collateral against which they can borrow. This provides a channel through which rising house prices can stimulate consumption spending. Many economists see this channel as playing a very important direct role in determining spending (Greenspan and Kennedy, (2005), Hatzius (2005), Benito et al, (2006)).

Monetary policy can affect household spending by easing/tightening credit conditions and increasing/reducing housing prices. Expansionary monetary policy in the form of lower interest rates could stimulate the demand for housing, which leads to higher house prices. The resulting increase in total wealth will stimulate household consumption. Standard life cycle wealth effects operating through house prices are thus an important element in the monetary transmission mechanism.

In terms of the appropriate monetary policy response to asset prices, economists hold rather different views. Some economists, such as Cecchetti and others (2000), Borio and Lowe (2002) and White (2004), argue that central banks should occasionally raise interest rates to stop asset price inflation from getting out of control. Other economists, however, contend that monetary policy aimed only at stabilising inflation is more likely to produce good outcomes for the economy (Bernanke and Gertler (2001)).

Household sector

Household balance sheet

An examination of the household balance sheet yields some information about the state of household finances in Thailand. According to a recent survey by Thailand's National Statistical Office (NSO) and the BOT, household assets in Thailand equal approximately 228% of GDP and significantly exceed household debt, which equals around 27% of GDP.[2] This implies that if household liabilities are redeemed, households will remain solvent as they hold sufficient assets to cover their liabilities. It should be noted, however, that the majority of household assets in Thailand are not liquid and may be subject to price declines during distress selling.

Assets such as real estate, for example, are difficult to liquidate. As a result, households with positive wealth may face cash flow problems, even though they may be solvent. Despite the fact that the value of total household assets is far greater than that of household debt, the household sector is still potentially vulnerable to shocks because the ratio of liquid assets (ie financial assets) to GDP – 30% – is only slightly higher than the ratio of household debt to GDP, while real estate assets amount to approximately 164% of GDP. This suggests that the financial position of the household sector might be rather less resilient than it appears to be in the aggregate balance sheet data.

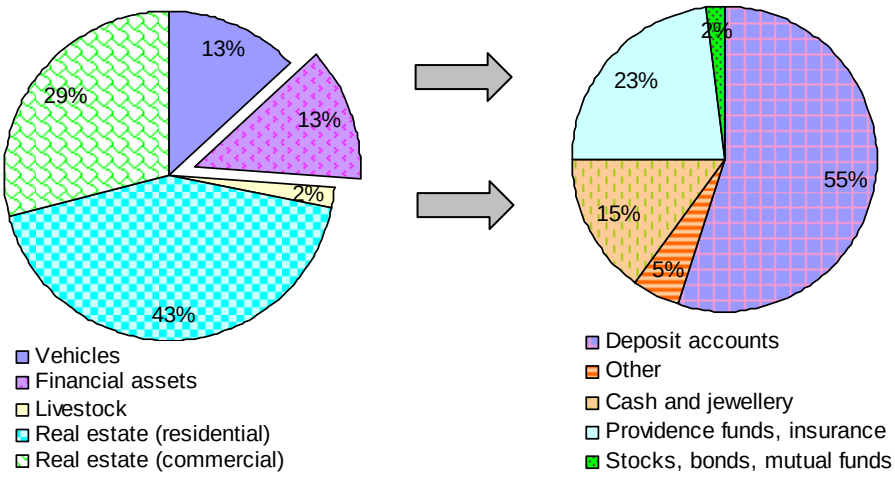
Graph 2 shows the extent to which household assets are dominated by real estate holdings. Financial assets account for only 13% of total assets. Bank deposits account for 55% of total financial assets, while securities – stocks, bonds and mutual funds – account for a much less significant portion, around 2%. The current structure of financial assets indicates that Thai households still rely more on banks than on capital markets. This is consistent with the fact that Thailand has a largely bank-based financial system, in terms of both deposits and lending.

And in terms of types of asset holdings, equities are much less significant in wealth creation than real estate. Residential and commercial real estate accounts for more than two thirds of total assets in Thailand. Since 99.5% of Thai enterprises are small and medium-sized, it is not surprising that households hold the largest share of commercial real estate (29%). This pattern is consistent with international experience, in that real estate accounts for a large portion of household assets in most countries.

[2] This survey, the outcome of a joint project between the BOT and the NSO, is a first attempt to measure household debt and assets across Thailand. The survey involves 11,162 households from all regions; 6,980 of the households live in urban areas and 4,182 in rural areas. Sample weights are calculated by the NSO to obtain statistics at the national level. Ariyapruchya et al (2007) based their analysis of the current state of the wealth and debt of Thai households on the survey.

Graph 2

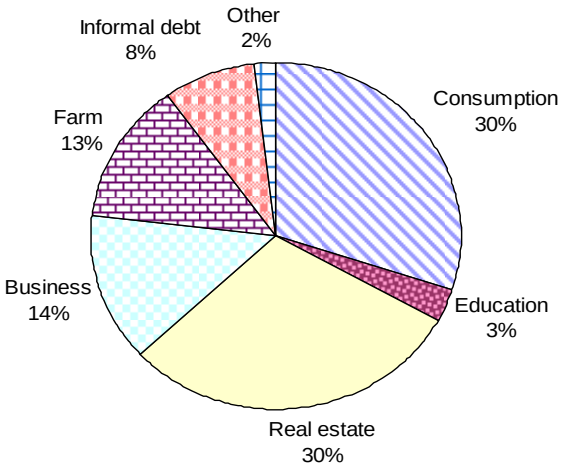
Composition of household assets



Source: NSO.

Graph 3

Composition of aggregate household debt



Source: NSO.

The importance of real estate in Thai households' asset portfolios derives from the fact that the first risky asset in which young households invest is usually real estate. As households age and become richer, they invest in other risky assets, such as stocks. In terms of the composition of household debt, Graph 3 shows that real estate also accounted for a large part of household debt (30%) in 2006, the same as consumption (30%), followed by business and agricultural debts (14% and 13%, respectively).

The large share of real estate in the asset and debt portfolios of Thai households indicates that households are likely to be quite vulnerable to volatility in real estate prices. In addition, the ratio of debt to assets is higher for low-income than for high-income households, suggesting that the former are more vulnerable to shocks. Higher debt is not necessarily a bad thing because it provides households with ways to smooth consumption. The risk is that high debt levels could force lower-income households to reduce consumption and defer payments on loans in the event of a shock.

Household financial access

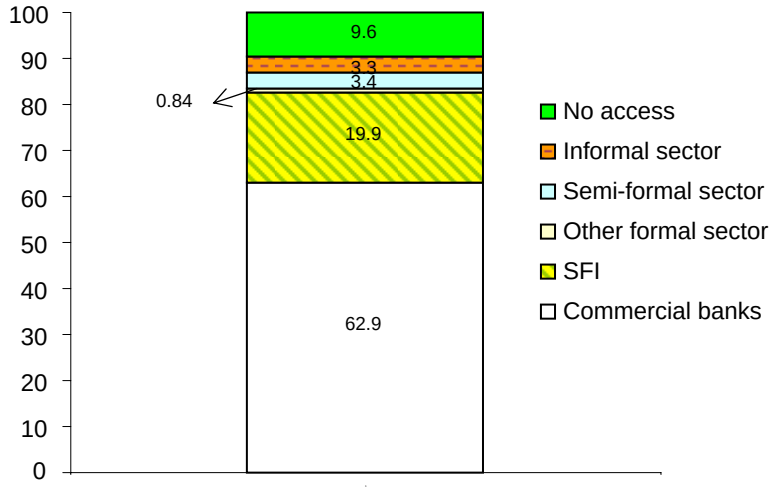
Households that have adequate liquid assets or access to credit markets would not need to make large cuts in consumption were household members to become unemployed. Instead, they would simply run down their savings or borrow more. On the other hand, households that have no liquid assets and cannot borrow would be forced to cut back spending in line with their reduced incomes.

Using data from the NSO's *Household socio-economic survey* and the newly designed questionnaire for measuring financial access and literacy that is attached to it, Ariyapruchya et al (2007) find that 90.4% of households have access to financial services; 83.65% are served by the formal sector, while the rest are served by the semi-formal and informal sectors. Thus, households with no financial access account for only 9.61% of the population.[3]

Graph 4

Household financial access structure

As a percentage of households



Source: NSO-BOT, *Household socio-economic survey*, Q4 2006.

In this study, households are divided into five income groups of equal size, with the highest incomes falling in the fifth quintile and the lowest in the first. The majority of households using the services of commercial banks and bank-like institutions in the formal sector are from the third, fourth and fifth quintiles – 13.13%, 16.39% and 18.81%, respectively.[4] In contrast, the majority of those served by specialised financial institutions (SFIs) are from the first and second quintiles – 6.41% and 5.73%, respectively – while the share of households

[3] The formal sector consists of formal financial institutions with clear legal status that are supervised or examined by the BOT – commercial banks, specialised financial institutions (SFIs), finance companies, credit fonciers, credit card and personal loan companies. The semi-formal sector consists of financial institutions that have legal status but are not supervised or examined by the BOT – cooperatives, credit unions and village funds. The informal sector consists of financial institutions that have no legal status and are not overseen by the Thai authorities – savings groups, moneylenders and other unspecified financial providers, such as pawnshops.

[4] The average monthly income in each group, starting with the bottom quintile, is THB 3,860.32, THB 7,765.35, THB 12,283.92, THB 20,090.05 and THB 55,180.88, respectively.

in the middle, high and highest income groups using the services of SFIs is 4.12%, 2.68% and 0.98%, respectively.

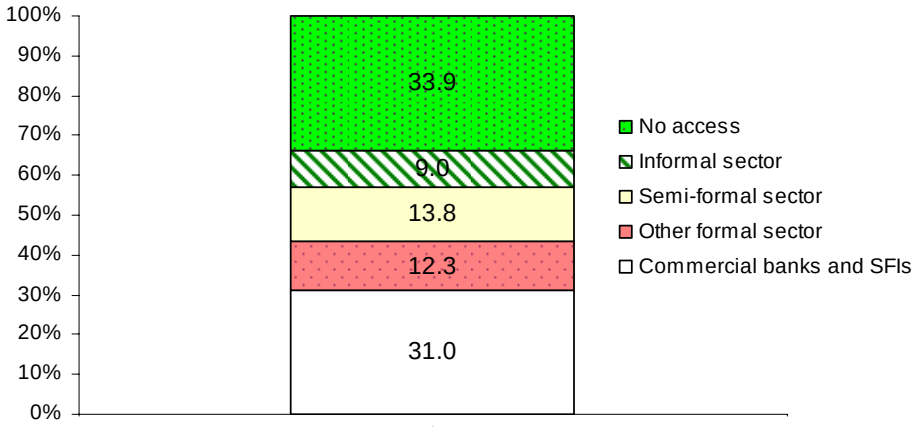
Thus, lower-income households obtaining financial services from the formal sector but unable to gain access to commercial banks and bank-like institutions rely mainly on SFIs.

Despite the relatively high proportion of households that have access to financial services, the story of household credit access is different. Approximately 33.93% of households do not use loans or other credit products from any financial institution (Graph 5). About 43.35% of households obtain loans and credit products from the formal sector, 31.02% of them from commercial banks and SFIs and the other 12.33% from finance companies, credit fonciers and credit card and personal loan companies.

Graph 5

Household credit access structure

As a percentage of households



Source: NSO-BOT, *Household socio-economic survey,* Q4 2006.

It is interesting to note that although only 9.61% of households do not have access to financial services, a much larger percentage of households do not have any access to credit. Most of the households that do not have credit access are in the two lowest income groups (the first and second quintiles), and inadequate collateral has been identified as the major obstacle to access.

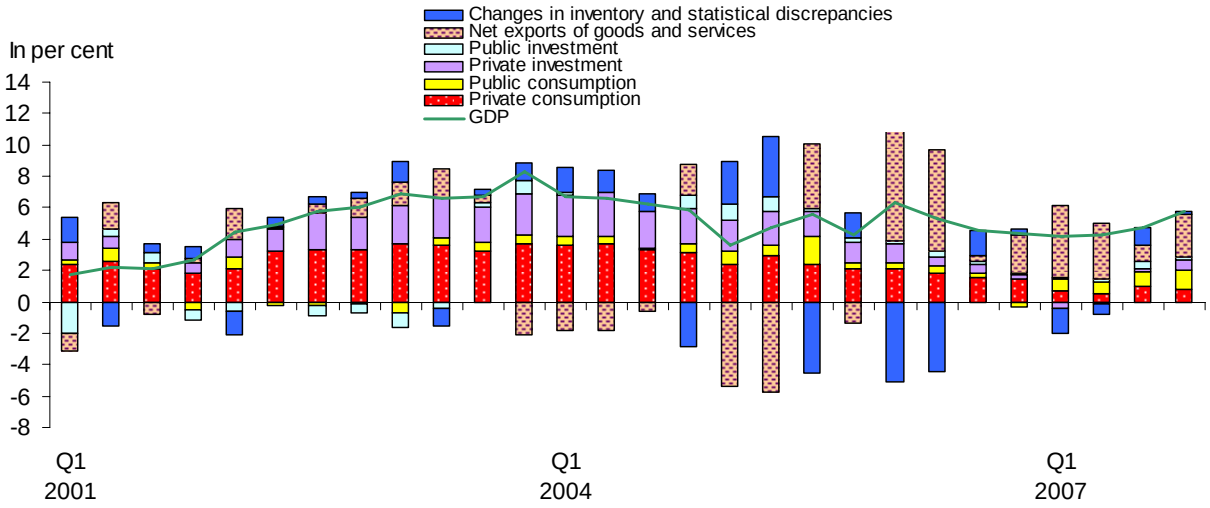
In summary, this section gives a bird's-eye view of the characteristics of Thailand's household sector. It remains relatively healthy in terms of the ratio of aggregate debt to assets, which is over 8:1. However, it should be noted that this broadly healthy household balance sheet masks the vulnerability of households to changes in housing prices. Real estate accounts for a large proportion of both the asset and the debt portfolios of the household sector, making it quite sensitive to shocks such as unemployment or rising interest rates. Households may face an increased debt burden and be unable to liquidate their assets in time to cover increased debt servicing costs. Combined with the fact that 33.93% of Thai households do not have access to credit, shocks could be exacerbated as a result of credit constraints, ultimately leading to reduced consumption and slower economic growth.

Consumption and household debt

A key feature of the Thai economy since the adoption of inflation targeting has been relatively stable household spending, in both real and nominal terms. The ratio of consumption to GDP has held steady at roughly 50% since 2000. GDP growth was driven primarily by consumption growth before 2006, when the contribution of consumption growth to GDP growth dropped (Graph 6).

Graph 6

Contribution to GDP growth



Source: National Economic and Social Development Board.

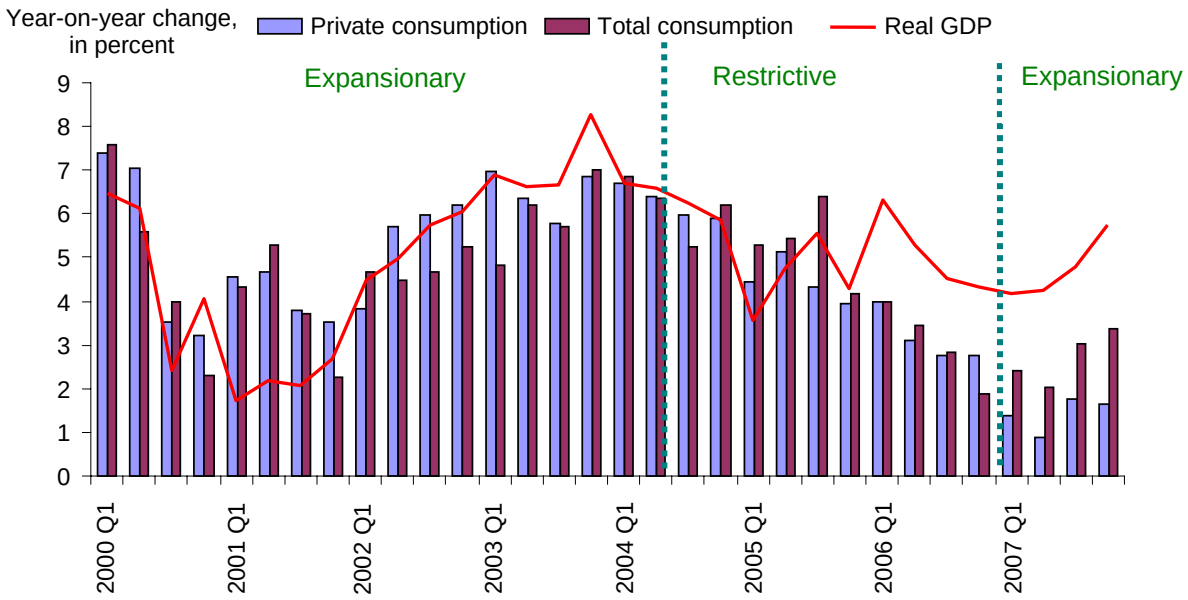
The slowing or acceleration of consumption growth, however, appears to be consistent with the monetary policy cycle. When inflation targeting was first adopted in 2000, economic growth remained weak because of the legacy of the 1997 crisis, so monetary policy easing was used to support economic recovery. During the expansionary phase (May 2000–July 2004), private consumption growth averaged around 5.2% a year. During the period of monetary tightening (August 2004–December 2006), consumption growth also began to slow. Private consumption growth during this period decreased to around 4.2% annually. The BOT adopted an accommodative monetary policy at the beginning of 2007, lowering the policy rate by 1.75% in the first half of 2007 and then maintaining it at 3.25% for the rest of the year. As a result, consumption growth, along with GDP growth, started to pick up in the second half of 2007 (Graph 7), indicating that household consumption is quite sensitive to changes in short-term interest rates.

The decline in private consumption growth in 2006 has been associated with a decline in household debt, which has been rising more slowly than income since 2006 (Graph 8), leading to a slight drop in the ratio of debt to disposable income, which stood at 52.1% at end-2007 (Graph 9).

It is interesting to note that the household debt cycle appears to be correlated with the housing price cycle. An increase in household debt is associated with an acceleration in housing price inflation and vice versa. Given the current benign housing market environment, Thailand's debt-to-income ratio remains at a low level by international standards. For the past few years, the slowdown in the housing market has been accompanied by reductions in both household indebtedness and consumption.

Graph 7

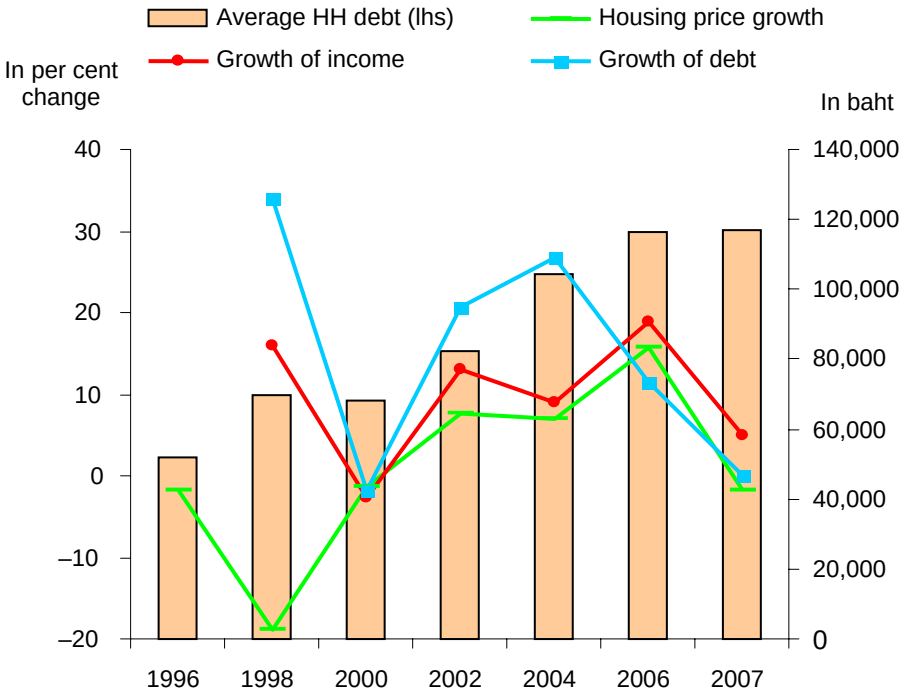
Monetary policy stance and consumption growth



Source: Bank of Thailand.

Graph 8

Housing prices and household debt

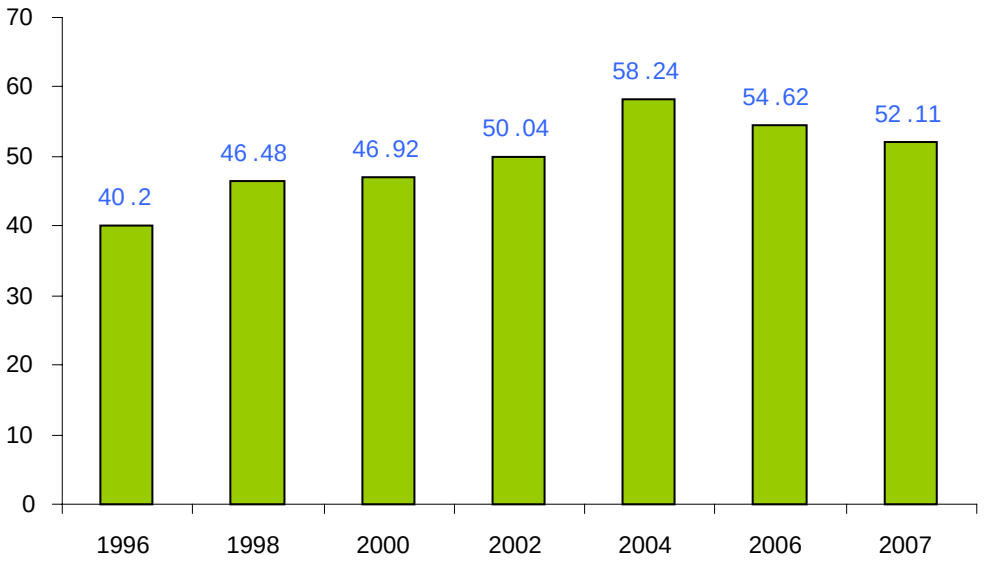


Sources: Jones Lang LaSalle; NSO.

Graph 9

Ratio of average debt to household disposable income

In per cent



Sources: NSO; authors' calculations.

Table 2 shows the correlation matrix of variables discussed in this section. House prices are strongly and positively associated with both household credit (0.8) and private consumption (0.7) in Thailand. In particular, house prices appear to influence the credit and consumption cycle of households. Meanwhile, the rise in household credit is associated with a rise in spending. Changes in short-term interest rates in the previous two quarters are negatively correlated with house prices, real consumption and real GDP. The channels through which monetary policy might affect spending will be further examined below, in the section "Putting it all together: monetary policy linkages".

Table 2

Correlation matrix: Q1 1993–Q4 2007

	Household credit	Policy rate[1]	Housing prices	Lending rate	Private consump-tion	Real GDP
Household credit	1.00					
Policy rate	0.3242	1.0000				
Housing prices	0.8068	–0.0532	1.0000			
Lending rate	0.1966	0.8825	–0.1179	1.0000		
Private consumption	0.5005	–0.4877	0.7067	–0.7081	1.0000	
Real GDP	0.5610	–0.4620	0.8012	–0.6144	0.9491	1.0000

[1] RP 14-day with two quarter lags.

Another indicator of the decline in household debt can be seen in the latest *Household socio-economic survey* (NSO (2007)).[5] The ratio of indebted households dropped from 66.4% in 2004 to 63.3% in 2007, reflecting the improved debt servicing capacity of Thai households in recent years. It should be noted, however, that the average debt per household increased from THB 104,571 in 2004 to THB 116,681 in 2007. And although the survey found that household income exceeded household expenses in most cases, the difference between the two was only THB 4,160 per household or THB 1,300 per person, most of which is being used to pay off debts. This implies that if there is a shock to household cash flows – ie unemployment or rising interest rates – households may need to cut back consumption.

Upon further examination of the structure of household indebtedness, we see that housing-related loans dominate household borrowing (Table 3). At the end of 2007, loans from commercial banks and non-bank financial institutions to households totalled around THB 1,558 billion, of which housing, credit card and personal loans accounted for 49.5%, 11.5% and 39%, respectively. Although the growth of credit card and personal loans has slowed since 2006, that of housing loans has accelerated. In general, households' ability to repay debt has improved, as seen in the continuing decline of the ratio of non-performing household loans.

Table 3

Outstanding household loans, 2007

	Loans In billions of baht	**As share of total loans In per cent**	**Ratio of non-performing loans to total household loans In per cent**
Household loans	1,558	100.0	4.0
Housing loans	771	49.5	4.5
Credit card loans	179	11.5	3.3
Bank	139	8.9	3.5
Non-bank	41	2.6	2.6
Personal loans	607	39.0	3.5
Bank	520	33.4	3.4
Non-bank	88	5.6	3.9

Source: Bank of Thailand.

Indicators of financial imbalances show that although the ratio of non-performing household loans from commercial banks is still low compared to the past couple of years, the ratio of special-mention loans[6] suggests more vulnerability in the low to medium income groups (Graphs 11 and 12). In other words, low- to middle-income households appear to be less financially robust than high-income households.

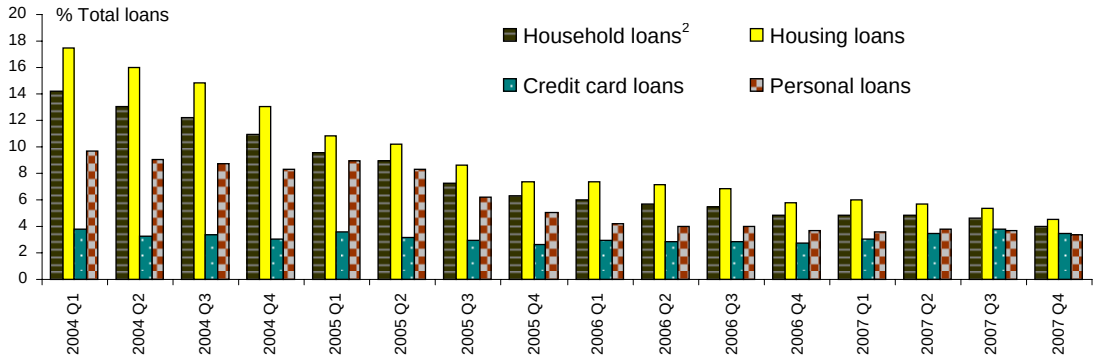
[5] This survey of 52,000 households was conducted in all of Thailand's provinces during January–December 2007.

[6] Special-mention loans are between one and three months overdue.

Graph 10

Ratio of NPLs to total loans outstanding of commercial banks[1]

In per cent



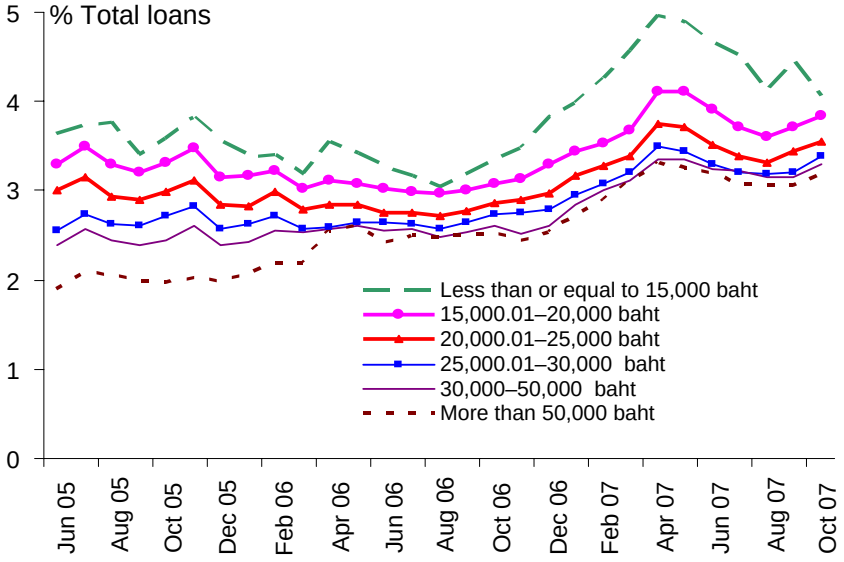
[1] Thai commercial banks and branches of foreign banks. [2] Household loans comprise housing, credit card and personal loans.

Source: Bank of Thailand.

Graph 11

Past-due and non-performing credit card loans broken down by income group[1]

As a percentage of total loans



[1] Bank and non-bank credit card loans under the BOT's supervision. Incomes shown here are monthly.

Source: Bank of Thailand.

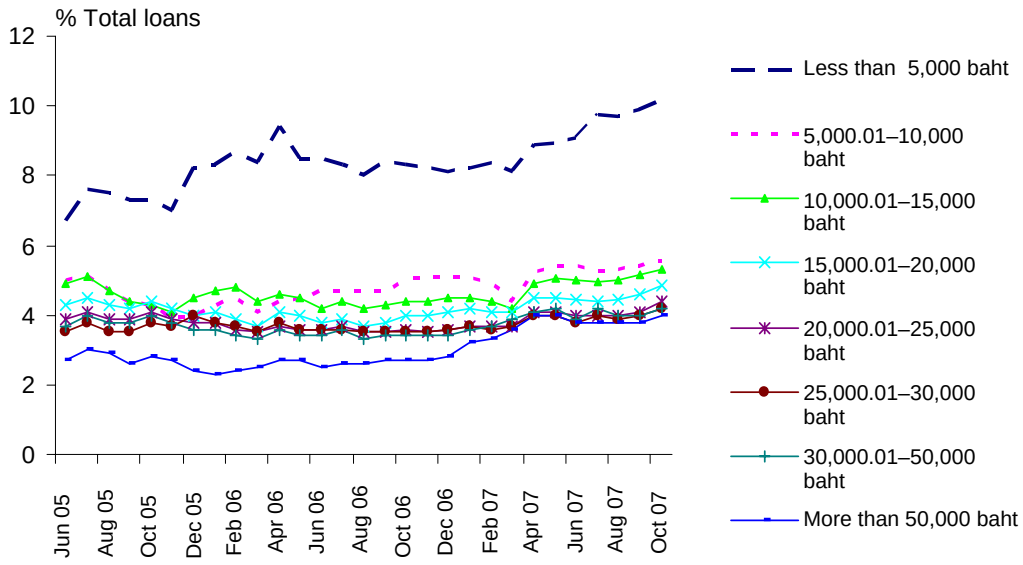
Special-mention credit card loans to households with monthly incomes below or equal to THB 15,000 account for about 4% of total loans, while those to households with incomes above THB 50,000 account for around 3.19%. The distribution of special-mention personal loans among the income groups is even more uneven. The special-mention personal loan ratio for households with monthly incomes below or equal to THB 15,000 is around 7%, compared to 4% for households with incomes above THB 50,000. Thus aggregate

non-performing loan ratios may mask the rise in household debt problems in some income groups.

Graph 12

Ratio of special-mention loans to personal loans broken down by income group[1]

As a percentage of total personal loans



[1] Bank and non-bank personal loans under the BOT's supervision. Incomes shown here are monthly.

Source: Bank of Thailand.

Table 4

Sensitivity of special-mention loans to interest rate shocks[1]

Income group[2]	Credit-card loans	Personal loans
Less than THB 5,000	n.a	0.66
THB 5,000–10,000	n.a	0.47
THB 10,000–15,000	n.a	0.02
THB 15,000–20,000	0.63	0.17
THB 20,000–25,000	0.65	–0.07
THB 25,000–30,000	0.76	0.27
THB 30,000–50,000	0.77	0.18
More than THB 50,000	0.80	0.70
Overall	0.74	0.02

[1] RP 14-day with two quarter lags. [2] Incomes shown here are monthly.

We further examine the interest rate sensitivity of special-mention loan ratios in various income groups. Table 4 shows that the ratio of special-mention credit card loans appears to be quite sensitive to interest rate changes (0.74). The ratio of special-mention personal loans

in the higher income group is less sensitive to interest rate changes but is still quite vulnerable to interest rate shocks in the low income groups, especially for households with monthly incomes below or equal to THB 10,000 (0.47–0.66). This is not surprising given that the average monthly necessary expenses of Thai households come to THB 14,500 (NSO (2007)). Households with monthly incomes below THB 15,000 will likely be sensitive to interest rate shocks as a result of higher debt burdens.

Currently, the BOT regards the financial delinquency of low- to middle-income households as a temporary problem, as households' income and ability to service debt should improve in the future with economic recovery supported by the authorities' accommodative monetary policy stance. However, it is necessary to continue monitoring developments in delinquency ratios for this particular income group to ensure that, going forward, overall financial stability will not be affected.

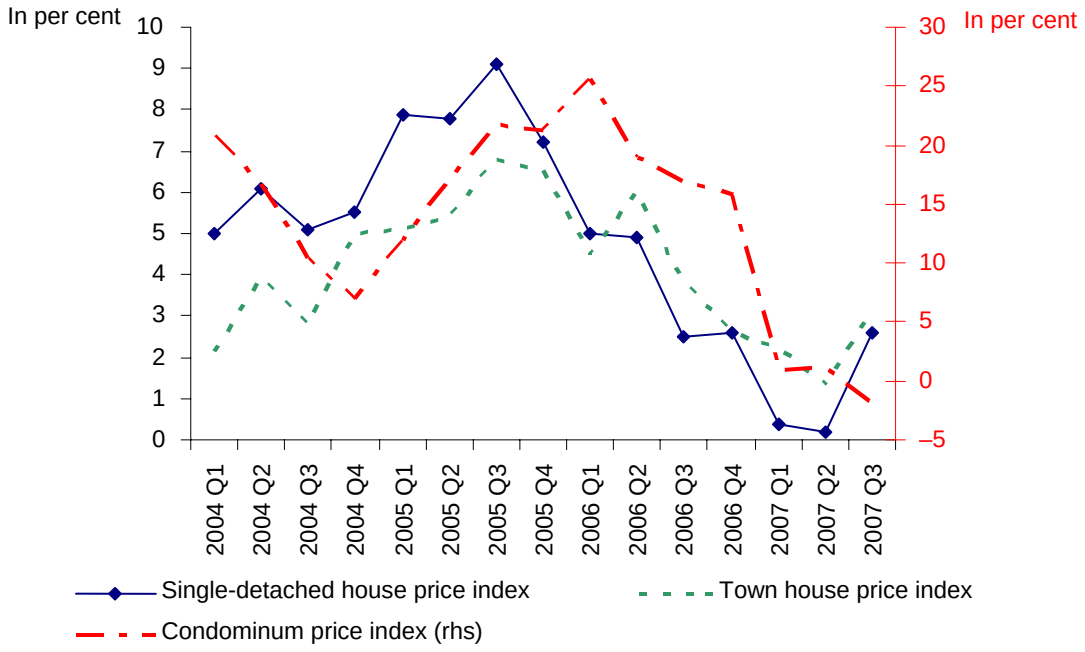
Housing market

Housing price development

Given that 30% of household debt and 72% of household assets are in the real estate sector, the issue of housing prices and housing finance is of critical importance for Thailand. Housing price growth in Thailand has exhibited a downward trend since the beginning of 2006, with some rebound in the third quarter of 2007 following rising construction costs. Overall, however, the housing market environment has been benign, with the prices of town houses, single-family detached houses and condominiums declining over the past few years. The prices of luxury condominiums, in particular, dropped considerably, partly owing to price reduction schemes to stimulate sales during a slump in demand (Graph 13).

Graph 13

Housing price inflation[1]



[1] Quarterly change in house price index.

Sources: Government Housing Bank; Jones Lang LaSalle.

Examining the housing price bubble in nine countries in the Asia-Pacific region, Glindro et al (2008) find that the price risk in Bangkok's average housing market segment remains low, although there is some evidence of overvaluation in the luxury condominium market. This is consistent with the BOT's view that, in general, the probability of a real estate price bubble and the risks surrounding the housing sector are still low.

Housing finance

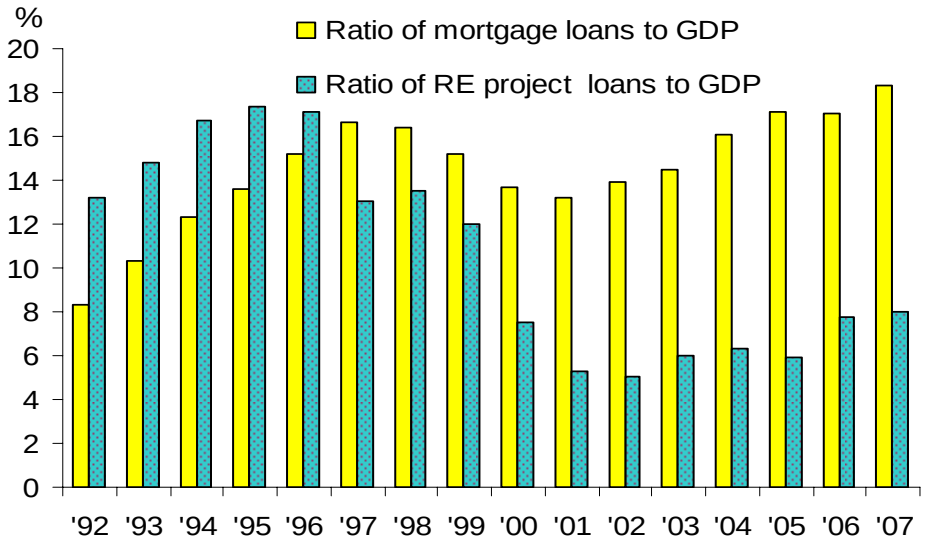
Housing finance is an important factor in determining housing prices in Thailand. Most developers require adequate funding for construction and consumers rely on borrowed funds from financial institutions for purchasing homes.

In Thailand, residential mortgage debt represented approximately 18.32% of GDP at the end of December 2007. The mortgage market has grown to exceed the level recorded prior to the 1997 crisis. In contrast, the ratio of real estate project loans to GDP has been much lower in the post-crisis period than in the pre-crisis period because capital markets have become an important alternative source of funding for developers (Graph 14).

Graph 14

Ratio of mortgage loans to GDP

In per cent



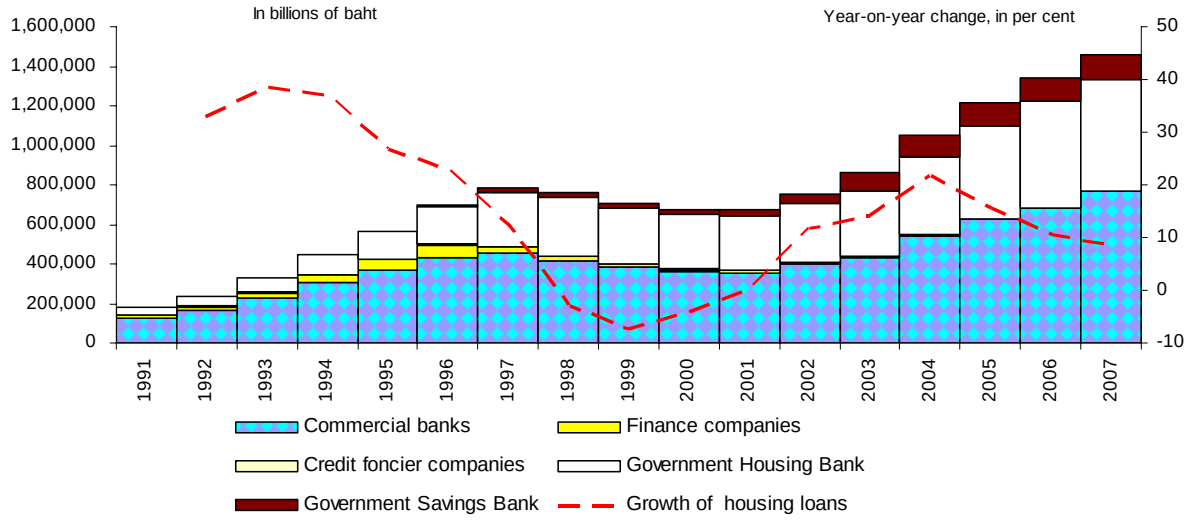
Source: Bank of Thailand.

Meanwhile, financial institutions are still the major providers of residential mortgage loans because homebuyers have limited access to other sources. Mortgage loans are available to homebuyers from both public and private financial institutions. The former include the Government Housing Bank (GHB) and Government Saving Bank (GSB) and the latter include commercial banks, finance companies and credit foncier companies.

Graph 15 breaks down outstanding mortgage loans by source. It shows that the role of the public financial institutions – particularly the GHB – as a source of financing for households has grown since the crisis. This is a result of government policy measures to help low- and medium-income workers buy their own homes. At end-2007, the GHB had a market share of 38.77% and the GSB, 8.27%. Thus, the combined market shares of the GHB and the GSB represent almost 50% of outstanding mortgage debt (Glindro et al (2008)).

Graph 15

Mortgage loans by type of financial institution



Source: Bank of Thailand.

Commercial banks, however, still dominate housing finance, with a market share of 52.9% as of end-2007. This is because of the strong competition between commercial banks, which use promotional tactics such as offering low one- to three-year fixed interest rates and longer maturities on mortgages.

The market for primary mortgage finance in Thailand is fairly segmented. Commercial banks usually compete for middle- and high-income households (many mortgage loans range from THB 1 million to THB 5 million), whereas the GHB has been serving households with more modest incomes. The increasing market share of the GHB is due largely to its low lending rates and the rapid expansion of its branch network.

The development of a secondary mortgage market in Thailand – particularly the repackaging of pools of mortgages into mortgage-backed securities – was proposed nearly two decades ago as a means of mobilising funds for the GHB. However, circumstances at that time did not permit mortgage securitisation. It was only in the early 1990s, under Thailand's Seventh National Economic and Social Development Plan (1992–96), that securitisation was approved as an instrument for boosting long-term savings and developing capital markets. Under the plan, the GHB was given a role to play in the securitisation of mortgage assets, and it will soon issue its first mortgage-backed securities (Glindro et al (2008)).

Mortgage rate

Thailand's housing finance market has generally been successful in delivering funding to individual homebuyers and developers at a reasonable cost, particularly in the context of the recovery from the 1997 crisis. The predominant product is a 25- to 30-year floating rate loan with rates adjusted to each bank's posted minimum lending rate (MLR) or minimum retail rate (MRR) (plus or minus a margin). Most lenders offer a one- to two-year "teaser" attractive fixed rate.

Some of the characteristics of housing loans today are a legacy from the past. This is due partly to government policy measures and partly to the intense competition among financial institutions, which motivates them to offer attractive terms on residential mortgages. The 1997 crisis was followed by a long period of expansionary monetary policy. Interest rates dropped to, and stayed at, low levels for a number of years. During this time, financial

institutions introduced various mortgage packages to attract customers. The competition among financial institutions has led them to raise loan-to-value (LTV) ratios from 80% to 85%, on average, of the appraised value of single-family detached houses, and from 75% to 80%, on average, of the appraised value of condominiums. In order to prevent instability in the real estate sector, in December 2003 the BOT set the LTV ratio for residences with an appraised value over THB 10 million at 70%.

In order to increase the affordability of housing, the government launched real estate stimulus packages in 1998 to enable commercial banks to offer both new and old borrowers maturities of 30 years on mortgages. The maximum repayment period for mortgage loans has, therefore, been extended from 20 years before the crisis to 30 years. The Thai government has also provided support to homebuyers, increasing the amount of mortgage interest they can deduct from their personal income taxes to THB 100,000, from THB 50,000.

In terms of performance, the quality of mortgage loan portfolios has improved, with the share of non-performing loans declining from almost 18% in early 2004 to 4.5% at the end of 2007. Banks have improved debt collection procedures (although the foreclosure process is still plagued by delays) and, in the case of old non-performing loans, have increased provisioning and write-offs, or sold the problem loans to asset management companies.

Putting it all together: monetary policy and its linkages

Monetary policy could affect the housing market and, in turn, the overall economy by raising or lowering short-term interest rates. As discussed earlier, monetary policy seems quite potent in determining household consumption in Thailand. The growth of consumption and GDP appear to accelerate during periods of expansionary monetary policy and to slow when monetary policy is tighter. This pattern may be attributed to house price movements. Increases in house prices as a result of easy monetary policy may encourage households to increase their current consumption in the expectation of higher future income.

This section analyses the above hypothesis by examining the transmission mechanism of house prices in the business cycle. Here we adopt the vector autoregression (VAR) methodology and estimate certain variables – GDP, private consumption, housing prices, household credit, the lending rate and the policy rate. These variables are deemed relevant from the stylised facts discussed in the earlier sections. As is commonly done in other studies, we use the short-term policy rate[7] as the measure of the monetary policy stance. The estimation is done using quarterly, seasonally adjusted data from the first quarter of 1993 to the fourth quarter of 2007 with two lags. All variables except the policy rate are in log form. The VAR is identified using a "recursive" Choleski decomposition with the ordering of variables as described above. The VAR model already represents the reduced form system and the results are quite robust to alternative ordering.

There are a number of channels through which higher interest rates affect household spending, house prices being one of the most important. Other things being equal, higher interest rates would reduce the demand for housing and hence house prices. Changes in house prices in turn have a wealth effect on consumption and GDP. Increased wealth can also be used as collateral to allow intertemporal substitution.

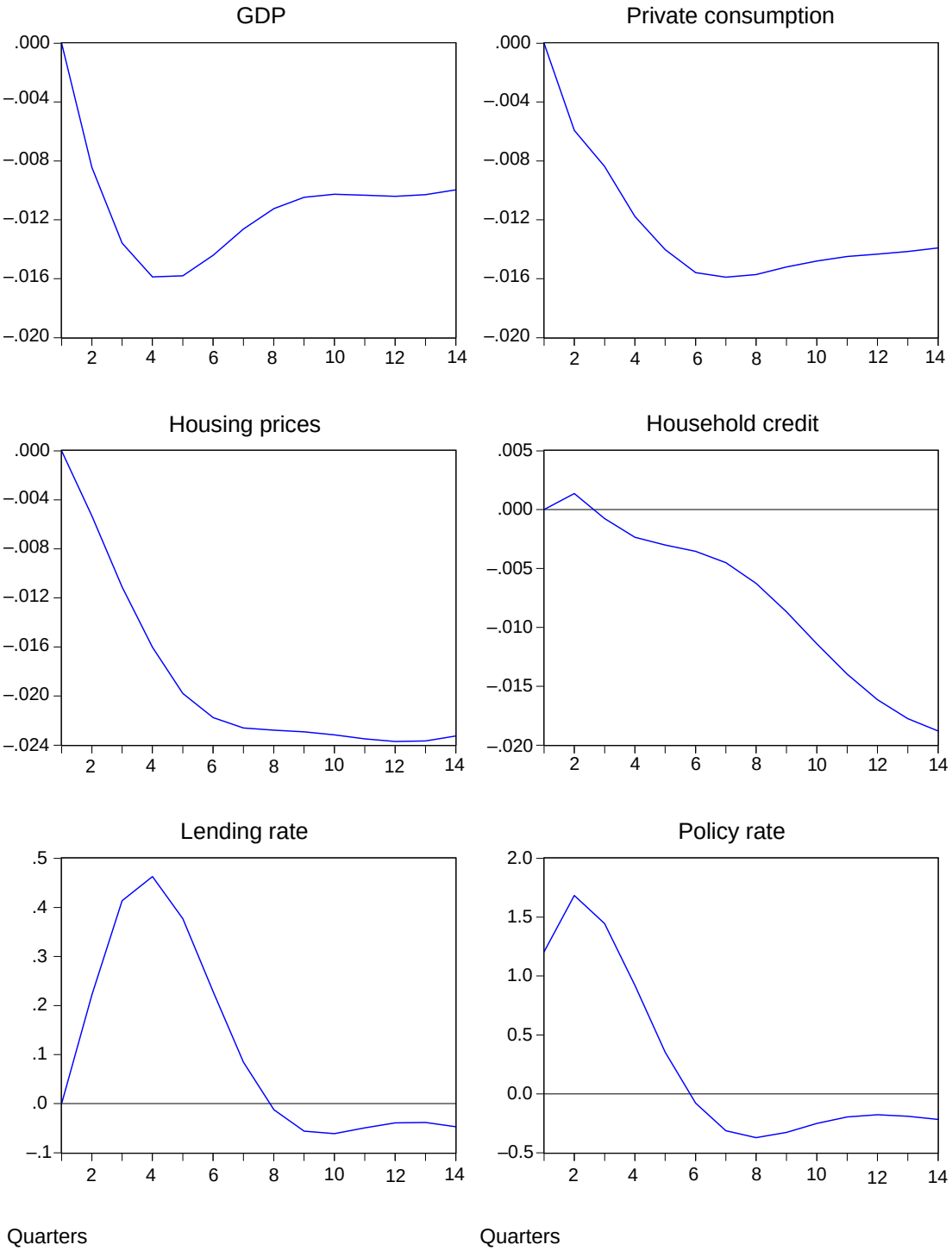
Graphs 16 and 17 show the house price transmission mechanism of monetary policy shocks. Tighter monetary policy has a negative effect on house prices as well as on consumption and

[7] We use the 14-day RP rate as the policy rate variable. On 17 January 2007, the Bank of Thailand switched to using the one-day RP rate. However, the 14-day and one-day rates are fairly close.

real GDP. House price shocks, in turn, have a significant effect on consumption and GDP. The causality test in Table 5 confirms the significance of both the policy rate and house price movements in determining spending in Thailand.

Graph 16

Response to policy rate shocks



Graph 17

Response to housing price shock

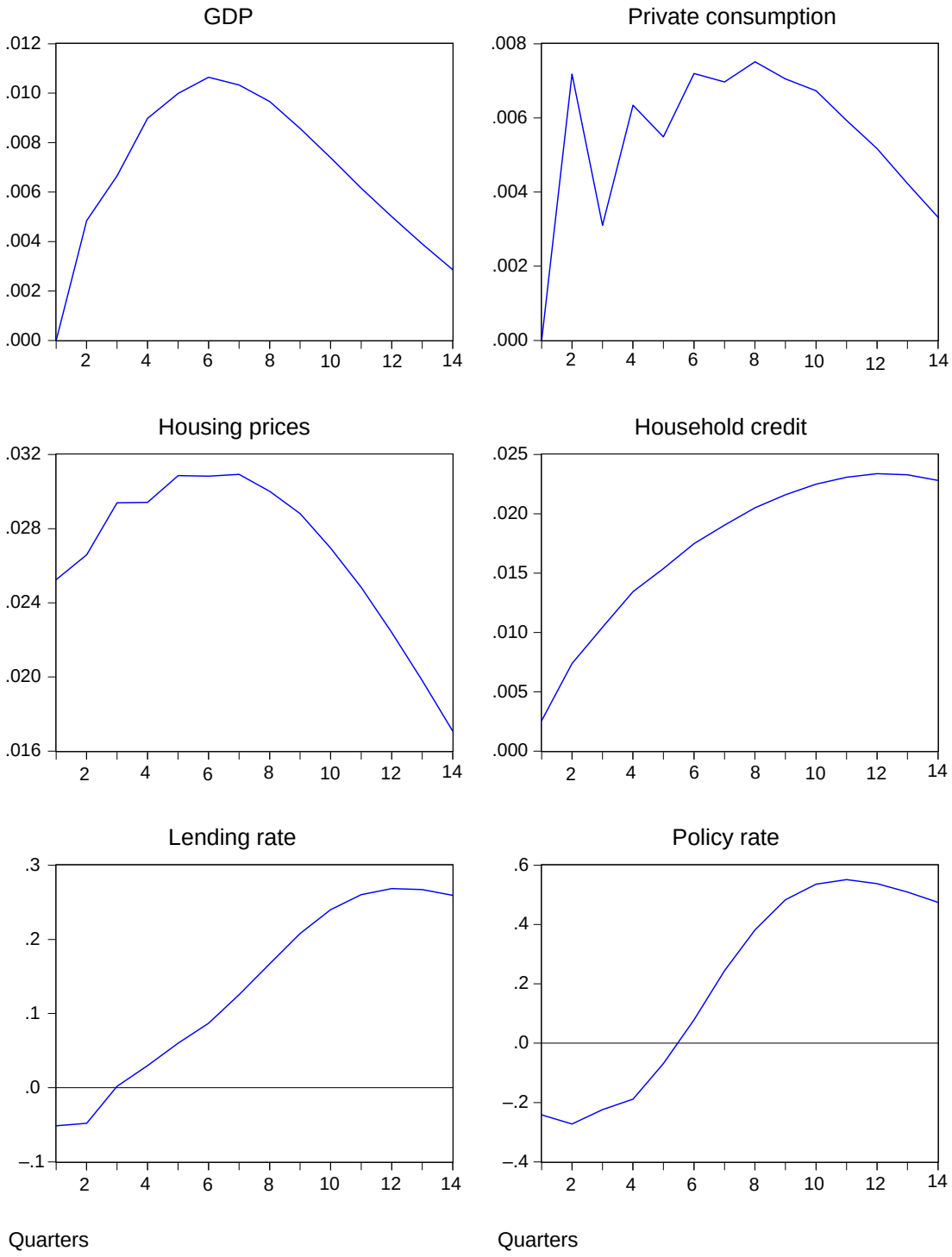


Table 5

Granger causality tests

Dependent variable	GDP	Private consumption	Housing prices	Mortgage credit	Lending rate	Policy rate
GDP			***			***
Private consumption			***	*		***
Housing prices				***		**
Household credit			***			***
Lending rate			***			***
Policy rate			*			

* Significant at 10% level. ** Significant at 5% level. * Significant at 1% level.

To have an idea of the share of the fluctuations in aggregate GDP and housing prices that is caused by different shocks, Graphs 18 and 19 present variance decompositions for GDP and housing prices at forecast horizons up to 14 quarters. The graphs give the percentage of the variance due to each shock. The results indicate that after six quarters, short-term interest rate shocks account for about 20% of the fluctuation in house prices. At the same time, house prices and interest rate shocks account for about 20% and 40%, respectively, of the fluctuations in output.

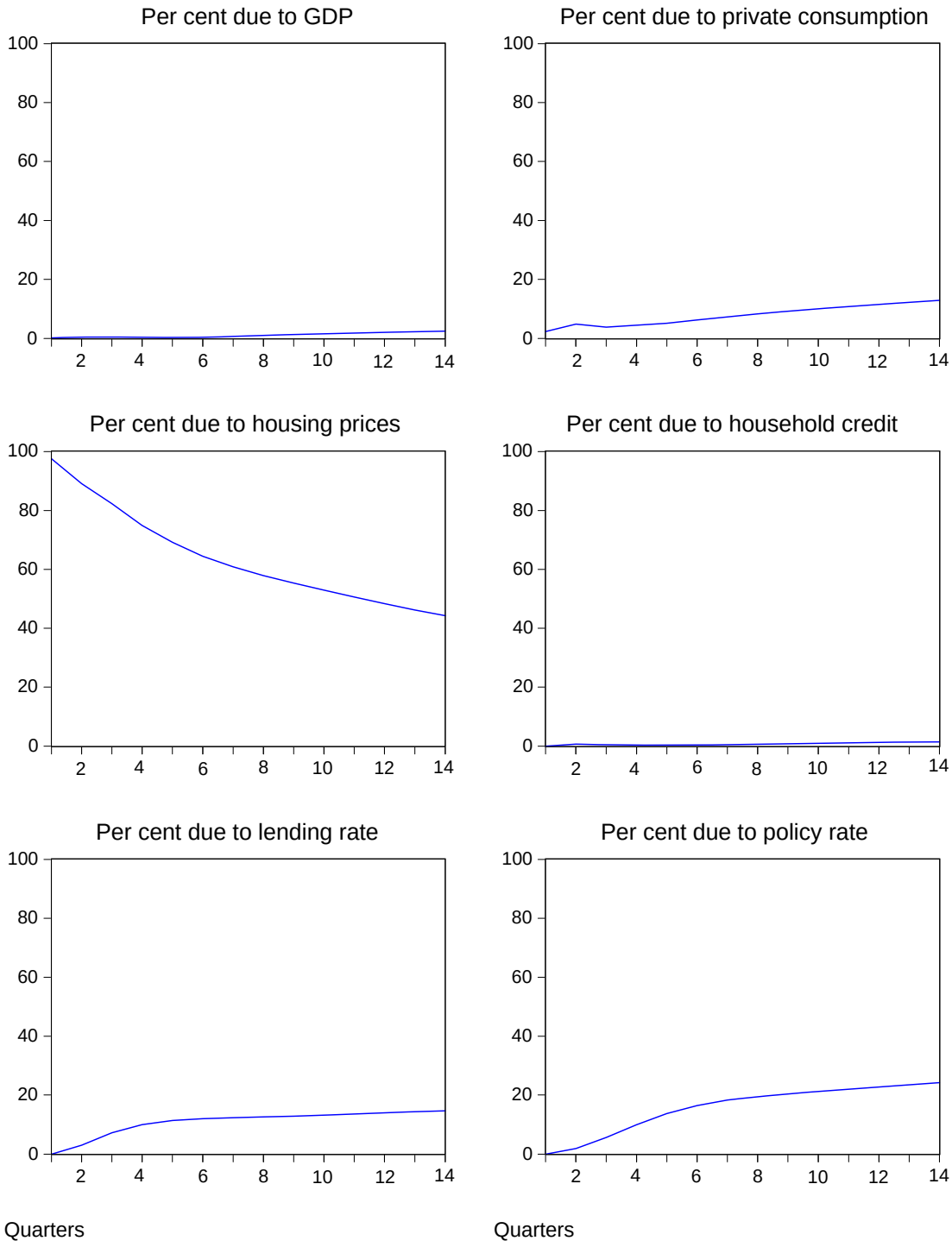
The magnitude of the output response to monetary policy and house price shocks in our analysis is due partly to the characteristics of the mortgage market in Thailand. Given the predominance of variable rate mortgage loans, house prices are particularly sensitive to movements in short-term rates. A reduction in the short-term rate can significantly depress mortgage rates and increase housing demand, resulting in higher house prices.

Collateral has also been identified as an important factor in household credit access in Thailand. Household consumption capacity could therefore increase as a result of the wealth effect of higher home prices, which could relax household borrowing constraints. The loan-to-value ratio has increased from 80% before the 1997 crisis to around 85–90% since the crisis. With greater wealth and declining down payment requirements and refinancing costs for housing loans, the effect of monetary policy on aggregate spending is enhanced. The potency of the housing price channel of monetary policy is also the result of several government-supported measures in terms of providing both housing loans and tax incentives for the real estate sector.

Because the BOT is responsible for managing the level of aggregate demand in the economy to achieve optimal outcomes for both inflation and employment, it is sensible for the BOT to respond to home prices to the extent that these prices affect aggregate spending. The issue of how the BOT might respond to house price movements is not whether or not it responds but whether its response is over and above what is called for in terms of achieving the objective of stabilising inflation and employment.

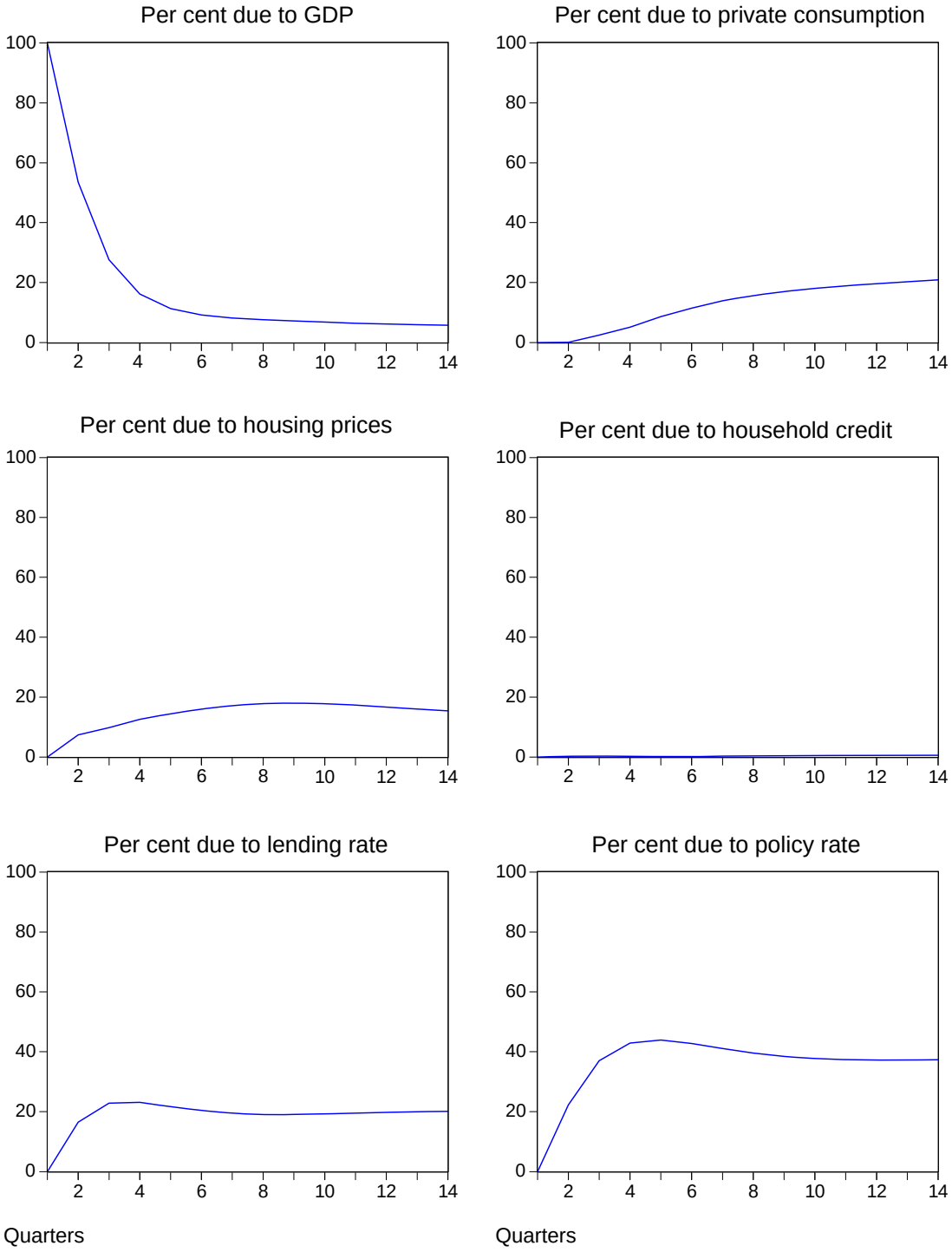
Graph 18

Variance decomposition of housing prices



Graph 19

Variance decomposition of GDP



Our analysis suggests that when the BOT raises interest rates, households in Thailand might be harmed by falling house prices, resulting in a slowdown in spending. This seems to be consistent with the financial accelerator framework, where declining house prices could weaken many borrowers, thereby raising the cost of external funding and, hence, the effective interest rate. The BOT, however, also has the ability to offset the adverse macroeconomic effects of the rise in the external finance premium by lowering interest rates

generally for all borrowers. In other words, the BOT has the tool it needs to keep the economy well balanced when households experience credit constraints.

The effect of monetary policy and housing prices on spending in the Thai economy concerns not so much new borrowing, but rather the impact of higher interest rates on existing borrowing, and on the future willingness of lenders to provide credit. In a rising interest rate environment, lenders may tighten credit standards for high-risk borrowers because of concern about these borrowers' ability to service their debt. The provision of credit is highly relevant to the consumption of groups, such as low-income households, that are generally credit-constrained. As discussed above, low-income households in Thailand have a relatively high debt burden. This possibly raises the sensitivity of the economy to interest rate changes. Low-income groups are more likely to be vulnerable to changes in interest rates because they are less likely to have other resources they can draw on to smooth consumption.

Conclusion and policy implications

This paper discusses the household sector, housing market and monetary policy framework in Thailand as well as their relationships with each other. It finds that the household debt and housing market situation in Thailand is generally healthy. Household debt is low and mortgage arrears have decreased significantly over the past few years. The ratio of household debt to income and housing price inflation in Thailand remain low, compared with other countries. Consumption growth is subdued as a result of slow house price growth and weak household spending in general. Meanwhile the proportion of non-performing household loans has declined substantially, from almost 18% of total household loans in early 2004 to only 4% at the end of 2007.

Notwithstanding the declining ratio of non-performing household loans and the benign environment of Thailand's housing market, most households are still vulnerable to economic shocks. The special-mention loan ratio for low-income households is high compared to that for higher-income households. In terms of financial access, one third of Thai households do not have access to credit and low-income households are found to be the most credit-constrained.

In terms of household balance sheets, assets far exceed debt. However, it should be noted that a large proportion of household assets in Thailand are illiquid assets, such as real estate, while household borrowing is dominated by housing loans. Aggregate spending is therefore particularly sensitive to house price movements.

The housing-dominated structure of the household sector's balance sheet, together with a reliance on variable rate mortgages, implies that the Thai economy is particularly sensitive to interest rate and house price movements. And because of this there is a general concern that the achievement of price stability may not be consistent with the achievement of financial stability.

In a perfect world where policy measures are available to clamp down on booms at an early stage, they should be used in order to ensure future macroeconomic stability. But in the absence of such policies, the policy interest rate is another instrument that can be used to restrain house price growth, over and above its role vis-à-vis the inflation target. This suggests that interest rates could be set at a higher level during a housing boom, or at a lower level during a downturn, than is required to achieve the inflation target.

However, the BOT view is that this may not be a good idea because raising interest rates simply to contain asset price booms, or decreasing interest rates to accommodate a decline in asset prices, may reduce one of the shocks, but probably at the risk of systematically missing the inflation target. This could destabilise the economy even more. In this context,

there is greater uncertainty on how fast and for how long the BOT should tighten monetary policy.

Findings in this paper suggest that monetary policy is quite potent due to the increased sensitivity of the household sector to interest rate changes. The effect of monetary policy is transmitted via two channels. The first is the interest rate channel. When monetary policy is tightened, the cost of borrowing increases, leading to a slowdown in household borrowing and economic growth. The second is the housing price channel. Structural changes in the provision of housing loans and variable rate mortgages make this channel particularly effective. Since consumers are more likely to respond to a rate hike by cutting spending, central banks should proceed carefully when tightening monetary policy in order to assess its impact.

In general, the BOT monetary policy stance is to change the policy rate in order to keep inflation within the specified range of the core inflation target. Maintaining interest rates higher or lower than is required to hit the inflation target in an attempt to rein in or boost housing prices is not consistent with the current view. The BOT, however, does monitor many financial imbalance indicators when making decisions about interest rates.

Going forward, it may be useful to ask why consumer demand and household spending in Thailand have weakened and contribute less significantly to economic growth. One possible explanation for weak consumer spending is that households could have been revising their assessment of their permanent income downwards as a result of falling home prices. The situation is aggravated by the lack of access to credit in Thailand, especially for low-income households that need to borrow to finance consumption. With falling home prices, the value of the collateral against which owners can borrow is also reduced. In the future, more investigation is needed to achieve an understanding of how household debt and housing price misalignments interact in practice and affect the overall economy to enable us to design the appropriate monetary policy response to a shock.

References

Ando, A and F Modigliani (1963): "The 'life cycle' hypothesis of saving: aggregate implications and tests", *American Economic Review*, vol 53, no 1, part 1 (March), pp 55–84.

Ariyapruchya, K, W Sinswat and N Chutchotitham (2007): "The wealth and debt of Thai households: risk management and financial access", *Bank of Thailand Symposium Paper*, October.

Bank of Thailand, *Inflation Reports*, various issues, available at www.bot.or.th.

Benito, A, J Thompson, M Waldron and R Wood (2006): "House prices and consumer spending", *Bank of England Quarterly Bulletin*, vol 46, summer, pp 142–54.

Bernanke, B S and M L Gertler (1995): "Inside the black box: the credit channel of monetary policy transmission", *Journal of Economic Perspectives*, vol 9, no 4 (Fall), pp 27–48.

——— (2001): "Should central banks respond to movements in asset prices?", *American Economic Review Papers and Proceedings*, vol 91, no 2, pp253–7.

Bernanke, B S and S Gilchrist (1999): "The financial accelerator in a quantitative business cycle framework", in J B Taylor and M Woodford (eds), *Handbook of Macroeconomics,* Elsevier Science-North Holland, vol 1C, pp 1341–93.

Borio, C and P Lowe (2002): "Asset prices, financial and monetary stability: exploring the nexus", *BIS Working Papers,* no 114, Basel, July.

Cecchetti, S G, H Genberg, J Lipsky and S B Wadhwani (2000): "Asset prices and central bank policy", *Geneva Reports on the World Economy*, no 2, London, July.

Glindro, E, T Subhanij, J Szeto and H Zhu (2008): "Are Asia-Pacific housing prices too high for comfort?" *BIS Working Papers,* forthcoming.

Government Housing Bank, *GH Bank Housing Journal*, various issues.

Greenspan, A and J Kennedy (2005): "Estimates of home mortgage originations, repayments, and debt on one-to-four-family residences", *Finance and Economics Discussion Series*, no 2005-41, Board of Governors of the Federal Reserve System, Washington, September.

Hatzius, J (2005): "Housing holds the key to Fed policy", *Goldman Sachs Global Economics Papers,* no 137, New York, February.

Lusardi, A (1996): "Permanent income, current income, and consumption: evidence from two panel data sets", *Journal of Business and Economic Statistics*, vol 14, no 1 (January), pp 81–90.

Modigliani, F and R Brumberg (1954): "Utility analysis and the consumption function: an interpretation of cross-section data", in K Kurihara (ed), *Post-Keynesian economics,* Rutgers University Press, pp 388–436.

National Statistical Office (2007): *Household socio-economic survey*.

National Statistical Office and Bank of Thailand (2006): *Household socio-economic survey*.

Souleles, N S (1999): "The response of household consumption to income tax refunds", *American Economic Review*, vol 89, no 4 (September), pp 947–58.

White, W R (2004): "Making macroprudential concerns operational", speech delivered at a Financial Stability Symposium organised by the Netherlands Bank, Amsterdam, 25–26 October, www.bis.org/speeches/sp041026.htm.