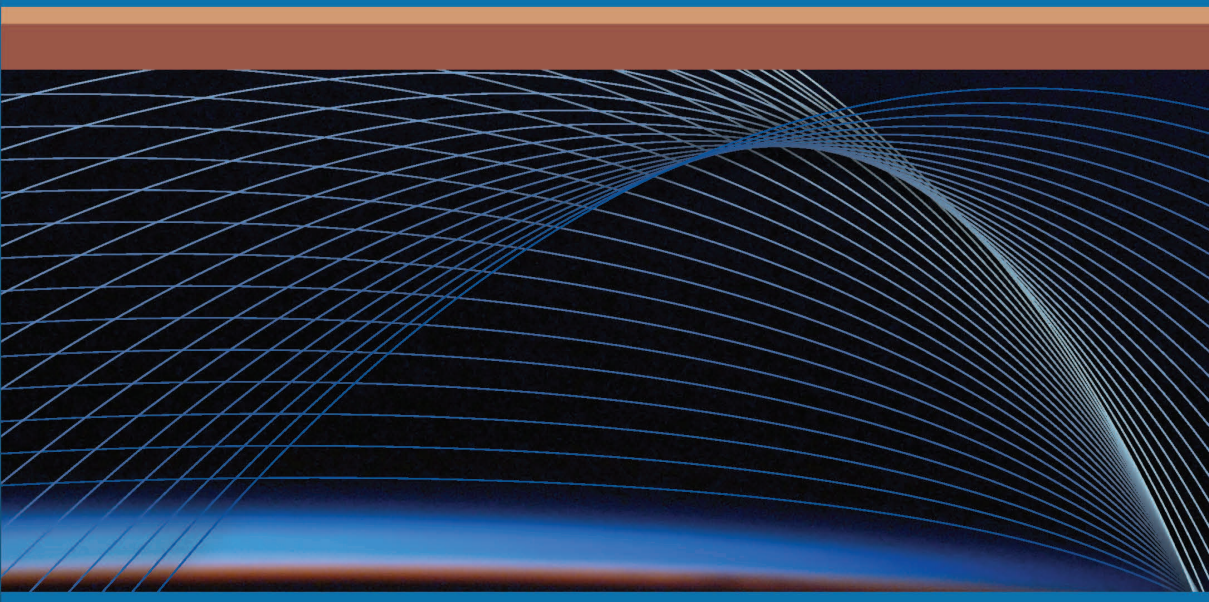
Household Indebtedness and Its Implications for Financial Stability

Don Nakornthab
(Project Leader)



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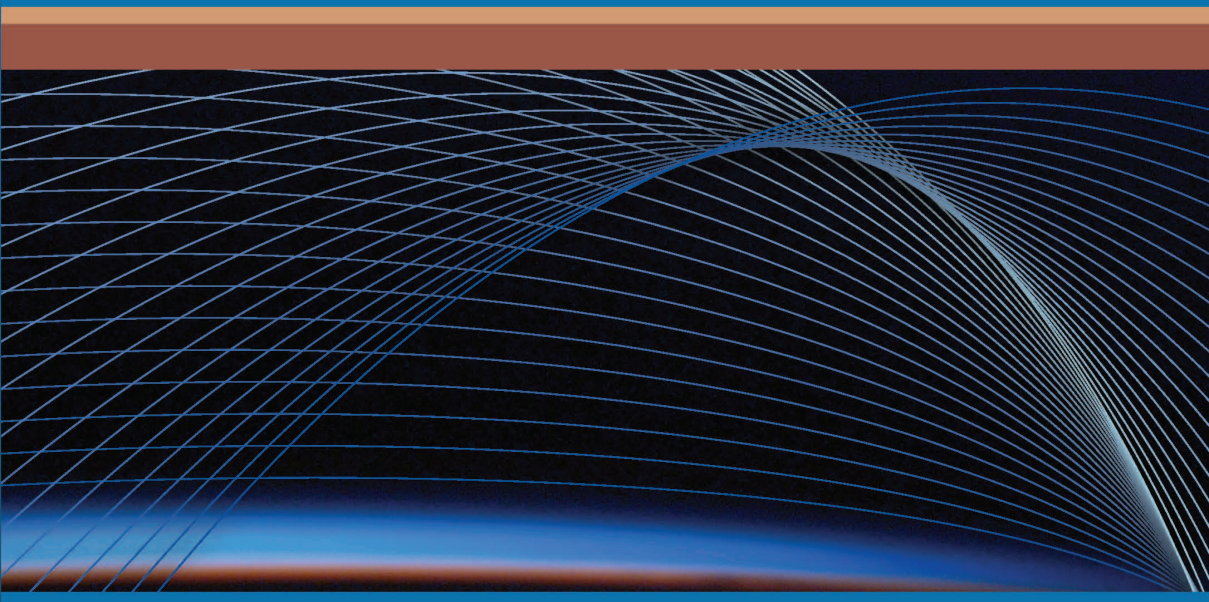

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by Don Nakornthab

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FOREWORD

The near collapse of the U.S. financial system that allowed U.S. households to become overextended and over-indebted has prompted a renewed interest on the issue of household debt sustainability and its bearing on financial stability. In many SEACEN countries, with rapid increases in household indebtedness over the past decade, the U.S. experience serves as a reminder of what may go wrong if the risk to the financial system that stems from the rise in household indebtedness, is not handled properly.

This research volume represents an attempt by The SEACEN Centre to have a proper understanding of household debt developments and their implications to financial stability in SEACEN member countries with an ultimate goal of helping policy makers to put in place preemptive measures to address any vulnerability that may arise while reaping the economic and welfare benefits of increased household indebtedness. It is the first study that compares and contrasts developments of household debt and household credit risk across SEACEN countries in a uniform manner. We hope that the findings and suggestions of this study will be valuable for policy makers with concerns on the maintenance of financial stability.

This collaborative research was led by Dr. Don Nakornthab, Team Executive, Macro Surveillance Team, Monetary Policy Department of the Bank of Thailand and concurrently Visiting Research Economist of The SEACEN Centre and participated by 7 country researchers of 5 SEACEN member central banks. The SEACEN Centre wishes to express its sincere gratitude to the project leader and participating member central banks and their country researchers for actively participating in this project and preparing the integrative report and country chapters respectively. The country researchers are namely Mr. Mao Sokanyn of the National Bank of Cambodia; Ms Nazreen Abdul Ghani of Bank Negara Malaysia; Ms Diwata Miguela E. Samarita of Bangko Sentral ng Pilipinas; Ms Fang Huei-Jung of the Central Bank of the Republic of China and Dr. Wanvimol Sawangngoenyvang, Ms Pimporn Thungkasemvathana and Ms Siriporn Siripanyawat of the Bank of Thailand respectively. The useful comments and suggestions of the external reviewer, Dr. Ram Kishen S. Rajan, Associate Professor, School of Public Policy, George Mason University, are also gratefully

acknowledged. Appreciation also goes to staff members of the Research and Learning Contents Department of The SEACEN Centre for their assistance.

The views expressed in this study, however, are those of the authors and do not necessarily reflect those of The SEACEN Centre or the SEACEN member central banks/monetary authorities.

Dr. A. G. Karunasena
Executive Director
The SEACEN Centre
Kuala Lumpur

August 2010

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EXECUTIVE SUMMARY

During the past few years, many SEACEN countries have experienced rapid increases in household debt/household credit, both in absolute terms and relative to the size of the economy and household income. In many cases, these developments reflect the SEACEN countries' financial sector deepening and are positive for economic activities and welfare. However, the rise in household debt also comes with a downside. Excessive household indebtedness makes households vulnerable to shocks which may lead to financial instability as vividly illustrated by the recent global financial crisis.

Against this backdrop, the main aim of this study is to garner a better understanding of the evolution of household debt and its potential consequences on financial stability in SEACEN countries. Among the specific issues investigated in the integrative report and the five country papers representing a spectrum of SEACEN countries (Cambodia, Malaysia, the Philippines, Taiwan and Thailand) are developments of household indebtedness in the SEACEN region including assessments from the demand-side and the supply perspectives, factors behind these developments, assessments of risks posed by household debt to financial stability, and policy implications for central banks/monetary authorities.

The findings of this study suggest that the threat of a household-debt-induced instability in this part of the world is remote. Most importantly, the levels of aggregate household indebtedness in SEACEN countries do not appear excessive relative to their economic fundamentals. A large part of the developments in household indebtedness in SEACEN countries can be explained by countries' stages of economic development and the contemporaneous macroeconomic and financial environments. At the same time, the shares of household loans in total bank loans are low to moderate in general. Finally, there appears to be no signs of significant stress on either household balance sheets or financial institutions' household credit portfolios at the moment. The majority of household loans are in collateralised residential mortgages which have low risk in the absence of a property price bubble.

Nevertheless, regional policymakers cannot afford to be complacent, but need to remain vigilant against increases in household indebtedness and financial institutions' household credit risk. This is because a number of forces are likely to contribute to strong increases in household indebtedness and increased household balance sheet vulnerability in the period ahead. First, post-crisis economic

recovery will provide support for further household debt accumulation. Second, given the low-to-moderate share of household loans to total bank loans, there is much room for further increases. Third, with house prices poised for a fresh new up-cycle, robust growth in mortgage loans is expected. Fourth, continued financial innovations and the region's adoption of the Basel II Accord which favours consumer loans over unrated corporate loans will further tilt bank loan portfolios towards household loans. Finally, against the expected increase in household debt relative to household income will be the uptrend in interest rates associated with the normalisation of monetary policy stances in many countries.

Beyond country-specific recommendations that appear in the country papers, the study suggests four main policy implications to ensure that the risk to financial stability posed by increases in household indebtedness is well contained. First, the authorities need to strike a balance between greater household credit access and heightened threats to financial stability as being too cautious will likely forgo the many benefits of household debt including economic growth opportunity. Second, the study highlights the inadequacy of household debt information in many SEACEN countries, ranging from the absence of centralised credit information system, limited loan categorisation and relevant financial indicators, to the non-existence of micro (household level) data. Given that the ability to detect and assess the threats to financial stability arising from developments in household debt early on depends critically on the availability of timely and comprehensive information on household debt, much can be gained from investing in data enhancements. Third, because the market cannot always be counted on for accurate risk assessment, authorities with concerns for the maintenance of financial stability need to have some tools for their own vulnerability assessment of the household sector. Among the tools advocated by this study are sensitivity/scenario analysis and stress testing, of which simple examples are presented in the Taiwan and the Thailand country papers. Finally, drawing on the lessons from the recent global financial crisis, the study suggests that the authorities adopt macro-prudential regulation and supervision which takes a financial-system-wide perspective on top of the traditional institution-specific micro-prudential one.

PART I:
INTEGRATIVE REPORT

PART I: INTEGRATIVE REPORT

CHAPTER 1

HOUSEHOLD INDEBTEDNESS AND ITS IMPLICATIONS FOR FINANCIAL STABILITY

by

Don Nakornthab*

1. Introduction

1.1 Background

During the past few years, many SEACEN countries have experienced rapid growth in household debt/household credit. In one aspect, an increase in the level of household indebtedness is desirable given its favourable effects on economic activities and welfare. However, excessive household indebtedness weakens and poses significant risk to household balance sheets. Given sufficiently weak household balance sheets and strong enough shocks, households may face in order of severity cash-flow problems, loan default, insolvency, and foreclosure, resulting in depressed consumption spending and financial instability if the financial system's exposure to the household sector is high enough. The downside of household debt is especially important in economies that lack strong macroeconomic fundamentals and/or have inadequate prudential regulations of the financial system.

Perhaps the most vivid example of the fallout of excessive household indebtedness on financial stability is the recent global financial crisis which originated in the United States. In the period leading up to the worst global calamity in seventy-odd years, U.S. household indebtedness rose to an unprecedented level. During this period, U.S. households became increasingly vulnerable to negative economic shocks, particularly those in the upper end of the distribution of the ratio of debt to income, i.e., the sub-prime borrowers. With the turn of the interest rate cycle coupled with the decline in house prices,

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many of these borrowers ran into payment difficulty, eventually leading to widespread defaults that triggered a severe financial crisis in the world's most advanced economy.

Given the significant potential impact of household indebtedness on financial stability, it is no surprise that much of the research on household debt during the past decade has been put forth by central banks. Examples are Ariyapruchya (2007, Bank of Thailand), Barnes and Young (2003, Bank of England), Dynan and Kohn (2008, FRB), Rinaldi and Arellano (2006, ECB) and RBA (2003). With contributions from Indonesia, Korea, Malaysia, the Philippines, and Thailand, BIS (2009) represents the most comprehensive collection of work on household debt in SEACEN countries to date. Yet, the five individual country papers in the volume differ substantially in their data coverage and focus, rendering cross-country comparison beyond a snapshot of high-level indicators difficult. On the other hand, Kusmiarso (2006), whose country papers are more uniform, focuses exclusively on housing and mortgage loans. With thirteen out of sixteen SEACEN countries covered[1], this study can thus be regarded as the first study to compare and contrast developments of household debt across the SEACEN countries.

1.2 Objectives

The objective of this study is to have a better understanding of the degree of indebtedness of households, the forces behind changes in the level of household indebtedness, and the consequences household indebtedness on financial stability in the SEACEN countries. In particular, issues related to the sustainability of household debt, household balance sheet vulnerability and impacts of household indebtedness on banks' loan losses will be examined so as to enable policymakers to put in place strategic measures to address adverse implications from the development in household debt while at the same time balancing the benefits gained from it.

1.3 Research Design and Organisation of the Study

This study is a collaborative project of The SEACEN Centre and the member central banks and monetary authorities. Under this collaborative arrangement, the researcher(s) of the member banks or monetary authorities are responsible for preparing the country chapters based on the agreed guidelines. Meanwhile,

1. The exceptions are Brunei Darussalam, Myanmar, and Papua New Guinea which do not have the required data.

the project leader from The SEACEN Centre prepares an overview and regional analysis, based on his own literature research and the findings in the country papers.

This report of the research project comprises two parts. Part One (this chapter) covers the overview and regional analysis. Part Two contains all the country chapters which are contributed by the researchers nominated by the member banks or monetary authorities.

The rest of this chapter is organised as of follows. Section 2 discusses data sources and data caveats. Section 3 details facts about household debt across SEACEN countries. Section 4 examines the various factors that have been identified by the literature as having been important driving forces of household indebtedness globally within the context of the SEACEN economies. Section 5 provides an assessment of risks to financial stability. Policy implications are discussed in Section 6. Section 7 provides concluding remarks.

2. Data Sources and Caveats

Most of the household debt data that appear in this chapter are from the SEACEN member central banks themselves, either from the contributed country papers or from separate surveys completed by non-participating central banks (Appendix 1). The rest are from public sources such as Bloomberg, CEIC, central banks' financial stability reviews/reports, and the International Monetary Fund's Financial Soundness Indicators (FSI) homepage. While it is impossible to check the accuracy of all self-reported data, reasonable care has been taken to ensure the integrity of these data by means of cross-checking with primary and other published sources as well as correspondences with member banks' contact persons.[2]

Constrained by the non-participating country survey, most of the data analysed in this chapter are in annual frequency and cover the period from 2003 to 2008. The choice of the start year of the survey was motivated by a concern about data requirement for certain non-participating countries and the fact that it was around this time that the rise in household indebtedness started to get noticed for its bearing on financial stability. The end year was dictated by the time the survey was conducted which was in 2009 Q3. In retrospect, the survey would

2. When the self-reported data differ from those from published sources but the differences are not too large, the former are used. The latter are used only when the discrepancies cannot be explained by data revisions and different data definitions.

have been made less comprehensive[3] at the benefit of a longer survey period so as to get a longer-term perspective for countries with available data. For example, in Korea, the surge in household debt took place between 1998 and 2002 whereas in Taiwan, the increase in household debt had been more gradual from 1987 to 1996.

In developed countries, data on household debt generally come from two sources, namely, the household debt section of the household or consumer finance survey and financial institutions data. The former has advantage of being comprehensive in nature and highly suitable to micro-level studies. The latter has advantage of having less bias of under-reporting and of containing data suitable for default study. So the two data sources complement each other nicely. Unfortunately, in a number of SEACEN countries, the survey data do not exist while the financial institutions data are usually confined to loans extended by commercial banks. Given that households also borrow formally from non-commercial bank sources such as government agencies, development banks, finance companies, and mortgage brokers and informally from relatives, friends, and money lenders, the amount of commercial banks' household loans inevitably understates the total amount of household debt and consequently total household debt burden. The extent of the understatement depends on the importance of the non-commercial bank sources in providing financing to households which varies from country to country.

Given the different providers of household debt, in this chapter, three commonly interchangeable words will be distinguished. As a generic term, the word "household debt" is used. When the providers of household debt include both financial and non-financial institutions, the word "household liabilities" is used. Finally, when household debt comes from only financial institutions, the word "household loans" is used.

Aside from the issue of the providers of household debt, it is important to distinguish between household loans and consumer loans (loans to households for consumption purposes: residential mortgages, auto loans, credit card loans, student loans, personal loans, etc.). The latter is obviously a subset of the former which also includes loans to households for business purposes. In gauging total

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3. Specifically, the survey has six parts: (1) basic household debt data, (2) sources of household debt, (3) home ownership data, (4) macro and financial variable data, (5) commercial bank loan data, and (6) government policies related to household debt. Ex post, it turned out that the survey was too ambitious, for most of the questions beyond part (4) were left blank, reflecting the difficulty in getting, if not the dearth of, relevant data across SEACEN countries.

household debt burden, it is therefore more correct to use the household loan figures. Unfortunately, in most countries, the publicly-accessible loan data are ones classified by purposes rather than ones classified by borrower entities. So researchers are often left with consumer loans to work with. This issue is quite important for many SEACEN countries where there are a large number of unincorporated small- and medium- enterprises (SMEs). In Taiwan, for example, roughly one-fourth of household loans are for business purposes. Using the amount of consumer loans instead of total household loans would substantially understate household indebtedness in the case of Taiwan.

In the analysis that follows, where data permit, the figures on household liabilities are chosen over the figures on household loans which in turn, are chosen over the figures on consumer loans. This ensures that the largest possible amount and the most complete picture of household debt are obtained in any country. An exception is Thailand, where household loans are used rather than household liabilities used by the country researchers, as rich households which account for the major share of debt are underrepresented in the survey data (Ariyapruchya, 2007). Yet doing so does have a drawback. Since household debt figures in different countries may be of different bases, cross-country comparisons will be compromised to a certain extent.

Finally, it should be noted that beyond a couple of headline comparisons, the required data for a comprehensive cross-country analysis are extremely scarce. The important missing data are household disposable income, household assets, household debt payment, characteristics of indebted households, and non-performing loan (NPL) ratios of household loans. This lack of data greatly reduces the breadth and depth of the analysis to follow.

3. Facts about Household Debt in the SEACEN Region

The sixteen SEACEN countries differ widely in their economic and financial structure and stage of development. The same can be said about the structure of household debt and the extent of household indebtedness. This section compares and contrasts developments of household debt across SEACEN countries from 2003 to 2008 in four key dimensions: (1) the growth of nominal and real household debt, (2) the extent of household indebtedness as measured by the ratio of household debt to GDP and the ratio of household debt to household disposable income, (3) the structure (purposes) of household debt, and (4) the sources of household debt. Comparisons of household leverage, household debt service, and household NPL rates are deferred to Section 5 when risks to financial stability will be assessed.

3.1 Household Debt Trends

Of the sixteen SEACEN countries, the nominal amount of household debt was obtained for thirteen countries: Cambodia, Fiji, Indonesia, Korea, Malaysia, Mongolia, Nepal, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam. Of these thirteen countries, Cambodia, Mongolia, and Vietnam have data available only for certain years. All in all, ten countries have data available throughout the 2003-2008 period.

Table 1
Amount and Growth of Household Debt, 2003-2008

	2003	2004	2005	2006	2007	2008	Nominal CAGR	Real CAGR	Average real GDP growth	Notes	
Cambodia			123	141	715	1,037	103%	86%	10%	commercial bank consumer loans	billion riel
Fiji	456	536	661	794	787	818	12%	8%	1%	commercial bank consumer loans	million FJD
Indonesia	113	151	207	226	283	367	27%	16%	6%	commercial bank consumer loans	trillion Rp
Korea	561	585	647	716	794	859	9%	6%	4%	financial institutions hh loans	trillion won
Malaysia	277	316	361	394	427	467	11%	8%	6%	hh liabilites	billion RM
Mongolia		211	318	501	826	987	47%	31%	9%	commercial bank hh loans	billion MNT
Nepal	3,365	3,554	3,588	5,839	8,120	9,437	23%	16%	4%	commercial bank consumer loans	million Rs
Philippines	348	404	440	481	551	492	7%	1%	5%	financial institutions hh loans	billion peso
Singapore	156	159	161	161	172	179	3%	0%	6%	hh liabilites	billion $S
Srilanka	60	85	113	160	207	264	34%	20%	7%	commercial bank consumer loans	billion Rs
Taiwan	5,826	6,806	7,596	7,746	7,960	7,966	6%	4%	4%	hh liabilites	billion NT$
Thailand	3,050	3,120	3,853	4,195	4,672	5,019	10%	6%	5%	financial institutions hh loans	billion baht
Vietnam		92		127			18%	9%	8%	hh liabilites	trillion VND
						Average 1 (entire sample) =	**24%**	**16%**	**6%**		
						Average 2 (exclude high-growth countries) =	**10%**	**5%**	**5%**		

Sources: country papers; non-participating-country surveys; MAS Financial Stability Review (2003 figure); Nepal Rastra Bank's Banking and Financial Sector Statistics; Author's calculation
Note: Consumer loan data for Nepal and Sri Lanka do not include household mortgage loans.

Table 1 shows the nominal amounts of household debt in the thirteen SEACEN countries with full or partial data along with the compound annual growth rates (CAGRs) and average real GDP growth rates for the period in which the country data are available. Over the five-year span, the level of household debt in the region increased across the board. The CAGRs range from a low of 3% per annum for Singapore to 103% per annum for Cambodia. The simple arithmetic average of the CAGRs for the whole sample is 24%, equivalent to a doubling of household debt every three years (Average 1). Excluding five countries with CAGRs higher than 20% (Cambodia, Indonesia, Mongolia, Nepal, and Sri Lanka), the average CAGR (Average 2) comes down to 10%, noticeably lower but still significant.

While such rates of increase in household debt easily make headline news, economically what matters is not the nominal but real household debt. To account for the effect of price changes, the nominal household debt in each country is deflated by the country's headline consumer price index during the corresponding period. Taking inflation into account, Cambodia still retains the position as the country with the highest CAGR of 86%. At the other extreme, real household debt was essentially flat throughout the period in Singapore. Taken as a group, the simple averages of real household debt growth for the whole and the high-growth-excluded samples are 16% and 5%, respectively.

While the real growth rates are still substantial, an important observation emerges if we look at the corresponding average real GDP growth rates of the two samples. Once we take out the five high-growth countries, the average real household debt growth in the remaining countries is the same as the average real GDP growth for the group. In other words, real household debt appeared to simply keep up with economic growth for this group of countries during this period. Individually, this growth pattern applies to Korea, Malaysia, Taiwan, Thailand, and Vietnam while Fiji had real household debt growth significantly above real GDP growth and the Philippines and Singapore experienced the opposite.

3.2 Household Indebtedness Trends

In principle, the growth rate of household debt should be evaluated in conjunction with the debt level. Fast growth from a small base is generally less worrisome than moderate growth from a high base. This is because households with high debt are more vulnerable than households with low debt. One way to make the debt levels comparable across countries is to convert them into a common currency unit, say the USD. Yet such conversion ignores the fact that 10,000 USD of debt, while being marginal in some countries, may be significant in others.

Internationally, the ratio of household debt to GDP and the ratio of household debt to household disposable income are commonly used to compare the extent of household indebtedness across countries. The former ratio measures household debt against the size of the aggregate economy and hence is only a rough indicator of household indebtedness. The latter ratio is more reflective of the actual household debt burden, but has the availability of the household disposable income data as its limitation.

Table 2
Household Debt-to-GDP Ratios, 2003-2008

	2003	2004	2005	2006	2007	2008	CAGR
Cambodia			0.47	0.48	2.09	2.46	73%
Fiji	26.0	28.0	34.0	38.0	39.0	40.0	9%
Indonesia	5.6	6.6	7.5	6.8	7.2	7.4	6%
Korea	73.1	70.8	74.7	78.8	81.5	83.9	3%
Malaysia	66.1	66.7	69.1	68.6	66.9	63.9	-1%
Mongolia		9.8	11.4	13.5	18.1	16.4	14%
Nepal	0.73	0.71	0.65	0.96	1.20	1.25	11%
Philippines	8.1	8.3	8.1	8.0	8.3	6.6	-4%
Singapore	96.0	86.0	80.0	72.6	68.5	69.5	-6%
Srilanka	3.3	4.1	4.6	5.5	5.8	6.0	13%
Taiwan	83.0	85.0	88.8	88.4	85.5	88.5	1%
Thailand	51.5	48.1	54.3	53.4	54.8	55.3	1%
Vietnam		12.8		13.0			1%

Sources*:* country papers, non-participating-country surveys, MAS Financial Stability Review (2003 figure), Author's calculation

Table 2 displays the ratios of household debt to GDP for the same set of countries in Table 1. From the Table, we can divide the thirteen SEACEN countries into three groups according to their levels of the debt-to-GDP ratio: low-debt (below 20% debt-to-GDP ratio: Cambodia, Indonesia, Mongolia, Philippines, Nepal, Sri Lanka and Vietnam), moderate-debt (20-50% debt-to-GDP ratio: Fiji) and high-debt (over 50% debt to GDP ratio: Korea, Malaysia, Singapore, Thailand, and Taiwan).

Against this backdrop, it is obvious that only the low- and moderate-debt groups experienced significant increases in the level of household indebtedness during the study period. Most notably, the ratio of household debt to GDP increased five times in three years in the case of Cambodia. In contrast, countries in the high-debt group hardly saw major increases in household indebtedness. With the exception of Korea, the CAGRs of the high-debt countries were 1% or below. For benchmarking comparison, it is noteworthy that the corresponding CAGRs during this five-year period for the U.S. (debt-to-GDP ratio of 106.6), the U.K. (98.5), and Australia (110.2) were 2%, 3%, and 6%, respectively.

Standing out in Table 2 is Singapore whose CAGR was -6%. In 2003, Singapore was the most indebted SEACEN country with the ratio of household debt to GDP at a staggering 96%. Over the next four years, however, the country managed to bring down the ratio significantly. The remarkable decline in Singapore's debt-to-GDP ratio was attributable to lackluster growth of

household loans (primarily mortgages and auto loans as credit card and non-secured personal loans recorded strong growth during the period) between 2003 and 2007 in the face of the buoyant economy.

The story of Singapore is different from those of the Philippines and Malaysia which also experienced negative CAGRs. In the two countries, the negative CAGRs were due mainly to a decline in the 2008 debt-to-GDP ratio. From the country papers, it is garnered that the declines were attributable to the global financial crisis which led to a marked curtailment in banks' loans to households for non-consumption purposes. Omitting the 2008 observations, their CAGRs would be slightly positive, in line with the rest of the countries in the high-debt group.

Table 3
Household Debt to Household Disposable Income Ratios, 2003-2008

	2003	2004	2005	2006	2007	2008
Indonesia	7.4	8.7	9.8	9.1	9.4	9.6
Korea	118.0	115.0	120.0	124.0	132.0	140.0
Malaysia					119.5	114.0
Philippines	11.4	11.5	11.2	11.1	11.6	9.2
Taiwan	117.9	122.0	128.6	126.1	124.1	128.4
Thailand	82.6	76.3	86.4	85.7	87.5	86.5
Australia	116.1	131.1	149.0	153.9	156.2	151.5
Japan	134.9	133.8	133.6	133.5	128.9	128.0
UK	138.0	151.3	153.7	167.4	174.1	168.7
US	115.0	120.5	128.2	132.6	135.4	131.7

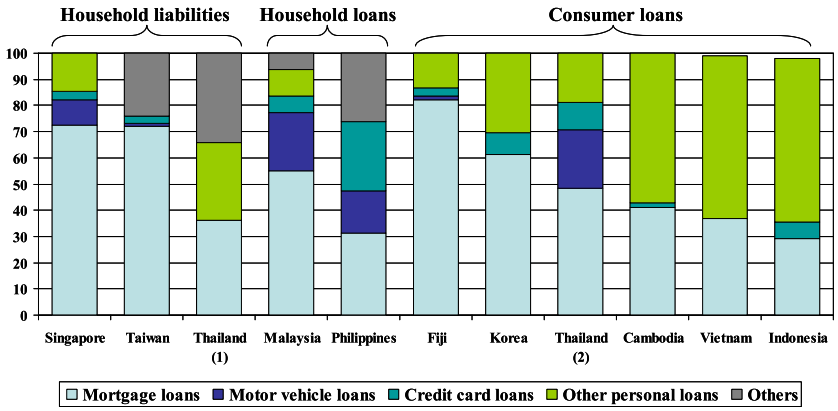
Sources: country papers, non-participating-country surveys, MAS Financial Stability Review (2003 figure); BNM Financial Stability and Payment Systems Report 2009; BOK Financial stability Report; CEIC; Author's calculation.

Table 3 shows the ratio of household debt to household disposable income for six countries with data along with four developed economies of Australia, Japan, the U.K., and the U.S. As mentioned earlier, the debt-to-disposable-income ratio is a better indicator of household indebtedness. Against this metric, it is notable that households in Korea, Malaysia, and Taiwan are already as indebted as households in the benchmark developed economies while Indonesia's and the Philippines' are still way below, with Thailand somewhat in between.

3.3 Purposes of Household Debt

Turning to the composition of household debt, Figure 1 shows that residential mortgages are the largest component of household debt in most of the SEACEN countries, accounting on average for about one half of total household debt. The sole exception is Indonesia where other personal loans, mostly auto loans, double the amount of mortgage loans, reflecting the underdevelopment of the mortgage market in the country.

Figure 1
Composition of Household Debt in Selected SEACEN Countries, 2008



Sources: country papers; non-participating country surveys
Note: For countries with insufficient data classification, the labels other personal loans and others include the missing loan categories

Incidentally, in several other countries where data permit classification, auto loans represent the second largest component of household debt. The dominance of mortgage and auto loans can be explained by their collateralised nature which helps ameliorate the information asymmetry problems. Nevertheless, in many countries, credit card loans and non-secured personal loans have been growing rapidly in recent years, reflecting in part the region's improved retail credit risk management capabilities. Still, credit card loans as a share of total household loans/consumer loans remain small in most countries. The most notable exception is the Philippines where credit card loans are only a short way behind mortgage loans. While credit card loans in the country has not reached the scale seen

in Korea where the share of credit card loans in total household loans was 45% in 2002 just before the eruption of the Korean credit card crisis in 2003 (Kang and Ma, 2008), nonetheless their growth and high level have prompted close monitoring by the authorities.

It is noteworthy that for countries where data on household business loans are available, that is, Taiwan, Thailand, and the Philippines (under the "others" label), the proportions of household loans ranged from 24% for Taiwan to 36% for Thailand. This suggests potential for the understatement of total household debt burdens in other SEACEN countries for which household debt figures do not include household loans for business purposes.

3.4 Sources of Household Debt

From the collected data, commercial banks are by far the largest *formal* provider of household debt in any country. While this is not surprising, it is noteworthy that in a number of SEACEN countries, government development banks or specialised financial institutions do play quite an active role in providing funds to households. In Thailand, for example, the Bank for Agriculture and Agricultural Cooperatives is the main creditor of Thai agricultural households. In Fiji, a similar role was assumed by the Fiji Development Bank whose mandates also extend to SMEs. In Nepal, a whopping 47 out of 59 development banks lend to households. In these three countries, the levels of household loans extended by various government development banks amounted to 68%, 25%, and 14% respectively of the levels of household loans extended by commercial banks at the end of 2008.

Public sector involvement is most visible in the area of housing finance. These include the Fiji Housing Authorities, the Treasury Housing Loan Division of the Malaysian Ministry of Finance, the National Housing Fund in Korea, the Housing Development Board in Singapore, the Government Housing Bank in Thailand, and the Home Development Mutual Fund (Pag-IBIG Fund) in the Philippines. It is noteworthy that the first four entities are not financial institutions.

Playing a tertiary role to commercial banks and government lenders in formal household lending are private non-bank financial institutions. Multinational credit specialists such as Aeon and GE Capital have been quite an instrumental force in the exploding area of personal finance. Japan's Aeon, perhaps the most aggressive of all credit specialists, has operations in Indonesia, Malaysia, Philippines, Taiwan, Thailand and Vietnam. In contrast, domestic non-bank financial institutions have a stronger hold in traditional secured lending such as

housing and auto loans. In Nepal, finance companies as a group are even more dominant than development banks, reminiscent of the role played by finance companies and credit fanciers companies during pre-1997-crisis Thailand.

Data on informal sources of household debt are available for Sri Lanka, Taiwan, Thailand, and Vietnam. Conceivably, the share of informal debt sources are related to a country's stage of financial development and this is borne out by the data. In Taiwan and Thailand, where the degree of financial deepening as reflected by the countries' banking system assets-to GDP-ratios is very high, the informal sources accounted for 5% and 11% respectively of total household debt in 2008/2009 according to the country papers. In contrast, the informal sources accounted for 39% of total household debt in 2004 in Sri Lanka, where the banking system is much smaller (Central Bank of Sri Lanka, 2004). According to Bain and Company (2007), only 2% of Vietnam's 84 million people have ever taken out a bank loan and about half of rural loans are from informal sources.

Looking at changes in the importance of the informal sources over time is also revealing. In Thailand, prior to the introduction of the government-directed village fund scheme in 2002, the informal sources accounted for 19% of household debt. In Sri Lanka, 60% of household debt in 1987 came from the informal sources. These and the aforementioned data suggest potential roles played by the informal sector in Cambodia, Indonesia, Mongolia, and the Philippines where retail banking is still nascent.

4. Forces Driving Household Indebtedness in the SEACEN Region

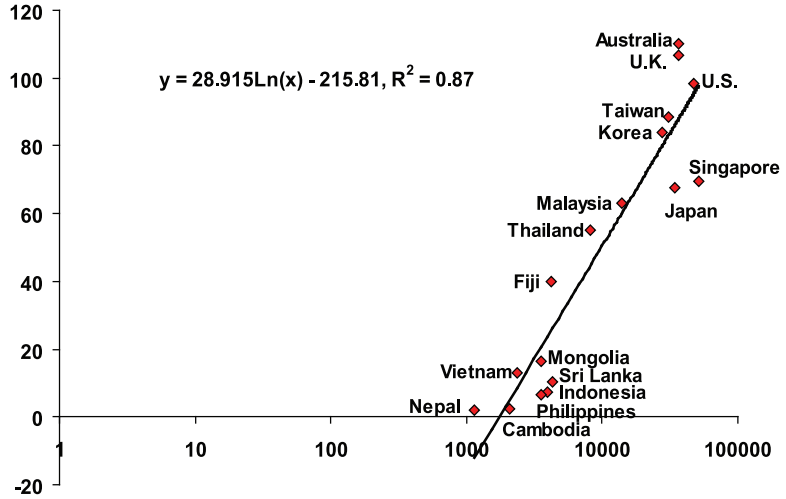
In this section, certain factors that have been identified in the literature as being the important driving forces behind the rise in household indebtedness worldwide during the past two decades are examined. A combination of summary statistics, graphs, and simple regressions are used to assess, the role of these factors in explaining household indebtedness in the SEACEN countries.

The theoretical foundation of most empirical analyses of household debt is the Modigliani and Brumberg (1954)'s life cycle model augmented by the presence of some borrowing constraints to allow for credit market imperfection. In this framework, the observed household debt is jointly determined by the demand-side and the supply-side factors. The demand-side factors comprise demographic variables such as age, educational attainment and homeownership, expected future income path, the cost of borrowing, wealth, and risk perception. The supply-side factors comprise the degree of financial access, the ability and willingness

to lend to households by financial institutions, credit market efficiency, related regulation, and financial innovation.

Before examining some of these factors in detail, it is worth noting that a number of these factors correlate with a country's stage of economic development. Households in rich countries generally have both greater need for and better access to credit than households in poor countries. Figure 2, which plots the 2008 ratios of household debt to GDP of the thirteen SEACEN countries and the four benchmark developed economies of Australia, Japan, the U.K., and the U.S. against each country's log nominal GDP (PPP) per capita, clearly confirms the hypothesized positive relationship between the level of household indebtedness and a country's stage of economic development.

Figure 2
Household Debt-to-GDP Ratio versus Log GDP (PPP) per Capita, 2008



Note: 2006 data for Vietnam
Source: Table 2; CEIC; World Economic Outlook database; Author's calculation

A simple regression equation relating the two variables indicates that their correlation is rather tight. Log GDP (PPP) per capita explains 87 percent of the variation in the debt-to-GDP ratio across the seventeen countries.[4] Thus,

4. Dropping the observations of the four developed economies reduces the fit slightly, with the R2 coefficient down to 0.86.

we may conclude from Figure 2 that on average the levels of household indebtedness in SEACEN countries primarily reflect the stages of economic development.

If the fitted line were to be taken as a benchmark for the ideal level of household indebtedness given a country's stage of development, then among the thirteen SEACEN countries, Fiji and Thailand would be classified as having excessive debt while Indonesia, the Philippines, Singapore, and Sri Lanka would be classified as having too little debt. Nevertheless, given that the data on household debt used here are of different bases and that GDP (PPP) per capita is unlikely to be the sole determination of household debt, these inferences should be viewed as only indicative.

Regardless of the applicability of the above regression, Singapore, the richest country in the sample on a GDP (PPP)-per-capita basis, is so far off from the fitted line that makes it an outlier (noting that the x-axis is in a logarithmic scale). Dropping Singapore from the sample improves R^2 to 0.91. Interestingly, using the 2003 data instead of the 2008 data finds the Singapore observation sitting nicely on the regression line. The Singapore experience demonstrates that a very rich country is not always synonymous with a highly indebted country (another notable example is Japan) and that it is possible to significantly reduce household indebtedness in a span of a few years.

Given that countries grow over time, there is a natural tendency for the ratio of household debt to GDP to increase over the years. The logarithmic relationship of Figure 2 implies that the rate of the increase tends to be progressively smaller as a country becomes richer. That poorer countries tend to experience faster increases in indebtedness bodes well with the stylised facts documented in Sector Three.

On the other hand, the fact that the debt-to-GDP in Australia, the U.K., and the U.S. increased at a greater pace than those of the high-debt SEACEN countries suggests that increases in household indebtedness in the three developed countries were perhaps more than warranted by their GDP (PPP) per capita. Indeed, it is the "abnormal" increases in household indebtedness in many advanced countries that prompted investigation into the issue of rising household debt. To this end, the literature attributes much of the rise in household indebtedness in advanced countries during the past two decades to four common factors: (1) the tranquil macroeconomic environment during the Great Moderation period where strong growth amidst low inflation and low macroeconomic volatility led to confidence in future income prospects and higher risk appetite, (2) an

easing of credit constraints associated with financial deregulation and financial innovations, (3) the decline in nominal and real interest rates associated with (1) and (2) that reduced respectively the initial loan repayment ratio and the real funding costs of financial institutions and households, and (4) increases in real house prices that encouraged housing purchases and necessitated larger borrowings. These four factors are discussed in turn in the following within the context of SEACEN economies.

4.1 Macroeconomic Environment

It is undeniable that the five-year period leading up to the global financial crisis in 2008 was a relatively prosperous one for the SEACEN region especially when compared to the period right after the 1997 financial crisis. Indeed, for a number of SEACEN countries, this period could be dubbed the "Great Recovery" period. With the sole exception of Fiji, real GDP growth rates of the thirteen SEACEN economies during the 2004-2008 period would be an envy of many regions in the world (Table 4). However, in terms of inflation, the situation is not so favourable. For most SEACEN countries, inflation had been rising throughout the study period partly due to rising oil prices. In fact, with exceptions of Indonesia and Korea, the average annual inflation rates for 2004-2008 were higher than those for 1998-2003. Thus, while robust economic growth mattered for increases in household indebtedness (with the exception of Singapore, obviously), we may rule out lower inflation as part of the explanations for the rise in household debt in the SEACEN region during the study period.

Table 4
Real GDP Growth and Inflation Rates, 1998-2008

Real GDP growth

	Avg. 98-03	Avg. 04-08	2004	2005	2006	2007	2008
Cambodia	8.2	10.3	10.3	13.3	10.8	10.2	6.7
Fiji	2.5	0.6	5.5	0.7	3.3	-6.6	0.2
Indonesia	1.0	5.7	5.0	5.7	5.5	6.3	6.1
Korea	4.2	4.2	4.6	4.0	5.2	5.1	2.2
Malaysia	3.2	5.8	6.8	5.3	5.8	6.2	4.6
Mongolia	3.8	9.1	10.6	7.3	8.6	10.2	8.9
Nepal	3.9	3.9	4.7	3.1	3.7	3.2	4.7
Philippines	3.3	5.5	6.4	5.0	5.3	7.1	3.8
Singapore	3.6	6.8	9.3	7.3	8.4	7.8	1.1
Srilanka	3.9	6.4	5.4	6.2	7.7	6.8	6.0
Taiwan	3.7	4.2	6.2	4.2	4.8	5.7	0.1
Thailand	2.2	4.7	6.3	4.6	5.2	4.9	2.6
Vietnam	6.4	7.8	7.8	8.4	8.2	8.5	6.2

Inflation

	Avg. 98-03	Avg. 04-08	2004	2005	2006	2007	2008
Cambodia	0.4	9.8	3.9	6.4	6.1	7.7	25.0
Fiji	3.0	4.1	2.8	2.4	2.5	4.8	7.8
Indonesia	18.8	9.1	6.1	10.5	13.1	6.0	9.8
Korea	3.5	3.2	3.6	2.8	2.2	2.5	4.7
Malaysia	2.3	3.1	1.4	3.0	3.6	2.0	5.4
Mongolia	6.8	12.0	7.9	12.5	4.5	8.2	26.8
Nepal	5.5	6.1	4.0	4.5	8.0	6.4	7.7
Philippines	5.6	6.4	6.0	7.7	6.2	2.8	9.3
Singapore	0.4	2.3	1.7	0.5	1.0	2.1	6.5
Srilanka	8.8	13.7	9.0	11.0	10.0	15.8	22.6
Taiwan	0.4	2.0	1.6	2.3	0.6	1.8	3.5
Thailand	2.3	3.9	2.8	4.5	4.6	2.2	5.5
Vietnam	2.9	11.1	7.9	8.4	7.5	8.3	23.1

Source: WEO database

4.2 An Easing of Credit Constraints on the Side of Financial Institutions

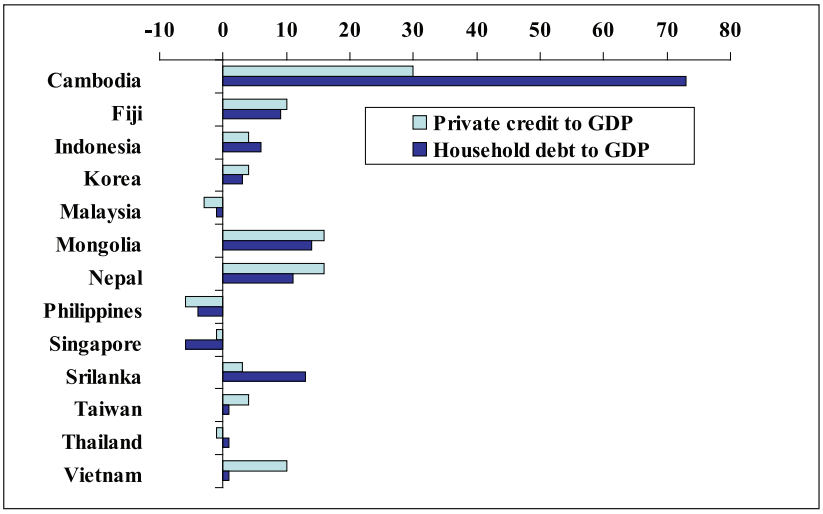
In tandem with the robust economic growth during the study period were strong increases in bank lending in many SEACEN countries. For the 1997-crisis-hit countries, it was the resumption in bank loan growth after years of painful tightening. For others, particularly the less developed ones, it was a consequence of financial deepening where loan growth twice real GDP growth was not uncommon.

These developments suggest an easing of overall credit constraints on the side of financial institutions during the study period. On top of greater demand for credit, banks were more able (due to better health) and more willing (due to the robust economic environment) to lend out. Given the increased flexibility, it is not at all a surprise to see a general expansion in household loans during this period. An important question with regards to household loans, however, is whether they grew more or less than financial institutions' overall loan portfolios.

Figure 3 plots the 2003-2008 CAGRs of the ratios of deposit money banks'/ other depository corporations' private credit to GDP in the thirteen SEACEN countries along with the CAGRs of the ratio of household debt to GDP from Table 2. With an exception of Thailand, the two CAGRs were in the same directions. Positive (negative) growth in private credit to GDP is associated with positive (negative) growth in household debt to GDP.

In seven countries (Cambodia, Indonesia, Malaysia, the Philippines, Sri Lanka, and Thailand), the CAGRs of household debt to GDP outpaced the CAGRs of private credit to GDP, suggesting shifts towards household credit in these countries during the study period. Of the other six countries where household debt grew less than private credit, the most notables are Singapore and Vietnam.

Figure 3
2003-2008 CAGR of Deposit Money Banks' Private Credit to GDP and Household Debt to GDP in Selected SEACEN Countries



Source: IFS lines 22d and 99b; Table 2; Central Bank of the Republic of China (Taiwan); author's calculations

While enlightening, Figure 3 should not be taken as definite because the sources of private credit and the source of household debt in a number of countries are different. Hence, the two figures are not exactly comparable. For example, the household debt figures in several countries correspond to commercial bank loans which are only a subset of private credit extended by deposit money banks/ other depository corporations.

Table 5 looks at the changes in the share of household loans/consumer loans to total loans extended by SEACEN's commercial banks. Focusing on bank loans circumvents the problem of different bases. Nevertheless, one should keep in mind that it ignores the possible substitutions between borrowings from banks and non-bank lenders. That banks lend more to households does not always mean that household debt will increase in aggregate. For example, in Singapore, much of the increase in financial institutions' housing loans during the study period was at the expense of the decline of housing loans extended by the Housing Development Board (HDB) as a result of government policy to encourage market-based lending for HDB properties. Looking at housing loans extended by financial institutions in Singapore alone, therefore, misses the fact that total housing loans in Singapore hardly grew during the period.

Table 5
Commercial Banks' Household Loans as Percent of Total Loans, 2003-2008

	2003	2004	2005	2006	2007	2008
Cambodia			5.4	4.1	11.4	11.2
Fiji	33.6	33.0	33.1	32.8	31.8	29.6
Indonesia	23.6	25.4	28.3	27.2	27.0	27.1
Korea	47.1	48.8	49.8	49.5	45.3	42.4
Malaysia	48.7	51.3	54.4	55.8	55.2	53.4
Mongolia		32.5	34.7	38.9	38.0	36.4
Nepal	27.9					30.8
Philipinnes	20.5	22.8	24.4	24.1	24.9	18.3
Singapore		34.7	31.7	30.0	26.9	26.4
Sri Lanka	14.1	16.4	17.3	19.4	20.6	24.4
Taiwan	43.1	45.8	47.2	47.0	47.0	45.8
Thailand	27.4	26.9	28.3	30.6	31.5	28.9
Vietnam						14.3

Sources: country papers; non-participating country surveys

From Table 5, it is evident that the majority of SEACEN countries saw an increasing proportion of household loans in bank loan portfolios between 2003 and 2008. The exceptions are Fiji, Korea, Philippines, and Singapore of which only Fiji and Singapore experienced trend declines. Singapore's experience is again striking. Despite the gain from housing loans for HDB properties and strong increases in personal loans during this period, the share of household loans in total loans extended by Singapore's banks continually lost ground to corporate loans.

In developed economies, the booming securitisation market, the availability of products that facilitate mortgage equity withdrawal, and the push into sub-prime lending in the case of the U.S all favoured household over corporate lending. While none of these apply to SEACEN countries, there are other forces that work in favour of higher shares of household loans in financial institutions' loan portfolios during the study period.

First, the bases are small. In developed countries, household loans generally account for more than a half of total loans extended by financial institutions. Of the SEACEN countries in our sample, only Malaysia has the share of household loans exceeding the 50 percent mark. Given the small bases, it is not much a surprise to see increasing shares of household loans in a number of SEACEN countries.

Second, improved credit information infrastructure (a number of countries have established before or during the study period, credit bureaus or central credit registries after the 1997 Asian crisis) and improved retail credit risk management technologies such as the adoption of credit scoring models, have made it easier for financial institutions to manage household credit exposures relative to corporate credit exposures.

Third, in several SEACEN countries, the economies during the study period were largely driven by consumption and net exports, for investment spending were relatively subdued partly as a result of the pre-1997 investment booms (International Monetary Fund, 2006). This led many banks in these countries to adopt a retail credit growth strategy that focused on lending to households.

Finally, a number of SEACEN countries have undertaken policy initiatives to increase greater household financial access in their countries. This includes Malaysia's Financial Masterplan (launched in 2001), Thailand's Financial Sector Master Plan (2004), and the Indonesian Banking Architecture (2004). Taking all these forces together, it is fairly safe to conclude that part of the increased household indebtedness in SEACEN countries during the study period has been supply-driven.

4.3 Lower Interest Rates

In addition to the easing of credit constraints on the financial institution side, the literature attribute much of the increase in household indebtedness in developed economies to the easing of credit constraints associated with the decline in nominal interest rates and the reduction in real borrowing costs associated with the decline in real interest rates. See, for example, Debelle (2004) and RBA (2003). The impact of the former on household debt undertaking is rather straightforward. When households face credit constraints in the form of ceilings on debt service, a lower nominal interest rate means households can borrow more for the same level of income. On the other hand, the effect of the latter is theoretically ambiguous. While the decline in real interest rates reduces the cost of borrowing, it also reduces the returns on and hence income from household financial assets which in turn discourages borrowings. Nevertheless, Kent et al. (2008) find that developed economies that experienced larger declines in real interest rates from their peaks tended to experience larger increases in the debt-to-income ratio, suggesting that in the real world the substitution effect outweighs the income effect.

Table 6
Nominal and Real Lending Rates, 2003-2008

Nominal lending rate

	2003	2004	2005	2006	2007	2008
Cambodia	18.5	17.6	17.3	16.4	16.2	16.0
Fiji	7.6	7.2	6.8	7.4	9.0	8.0
Indonesia	16.9	14.1	14.1	16.0	13.9	13.6
Korea	6.2	5.9	5.6	6.0	6.6	7.2
Malaysia	6.3	6.1	6.0	6.5	6.4	6.1
Mongolia	31.9	31.5	30.6	26.9	21.8	20.6
Nepal	n.a.	8.5	8.1	8.0	8.0	8.0
Philippines	9.5	10.1	10.2	9.8	8.7	8.8
Singapore	5.3	5.3	5.3	5.3	5.3	5.4
Srilanka	10.3	9.5	10.8	12.9	17.1	18.9
Taiwan	3.4	3.5	3.8	4.1	4.3	4.2
Thailand	5.9	5.5	5.8	7.4	7.1	7.0
Vietnam	9.5	9.7	11.0	11.2	11.2	15.8

Real lending rate

	2003	2004	2005	2006	2007	2008
Cambodia	46.9	13.2	10.3	9.7	7.9	-7.2
Fiji	3.3	4.3	4.3	4.7	4.0	0.2
Indonesia	9.5	7.6	3.3	2.5	7.4	3.5
Korea	2.6	2.2	2.8	3.7	3.9	2.4
Malaysia	5.2	4.6	2.8	2.8	4.3	0.6
Mongolia	25.5	21.8	16.1	21.5	12.6	-4.9
Nepal		4.4	3.4	0.0	1.5	0.3
Philippines	5.8	3.9	2.3	3.3	5.7	-0.5
Singapore	4.8	3.6	4.8	4.3	3.2	-1.1
Srilanka	1.3	0.4	-0.2	2.6	1.1	-3.0
Taiwan	3.7	1.9	1.5	3.5	2.5	0.7
Thailand	4.1	2.7	1.2	2.6	4.7	1.5
Vietnam	6.0	1.7	2.4	3.4	2.6	-6.0

Note: Real lending rates are calculated using same-year CPI inflation rates
Source: IFS line 60p; Author's calculation

Table 6 shows the level of the nominal and the real lending rates in SEACEN economies between 2003 and 2008. During this period, nominal lending rates in most SEACEN countries exhibited a slight upward trend. Thus, like inflation, the nominal interest rates were likely to act as a brake on household debt accumulation rather than as a positive contributor during the study period.

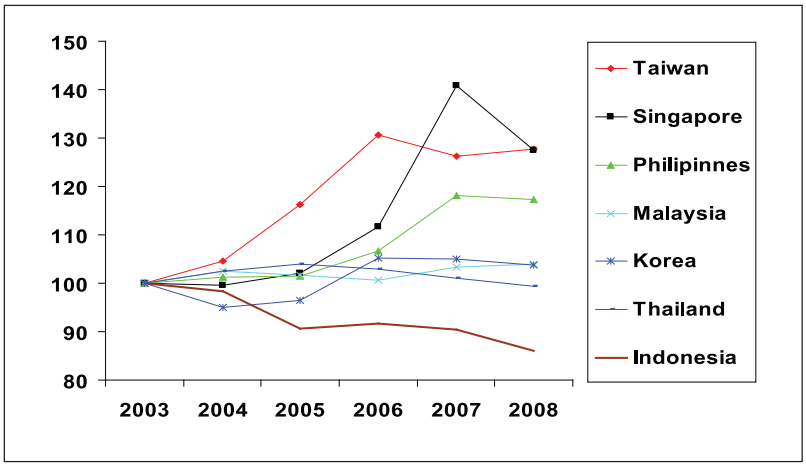
On the other hand, real lending rates in a number of countries displayed a downward trend during this period as the nominal lending rates rose less than what would be predicted by the Fisher effect. In light of the experiences of developed countries, the fall in real lending rates was likely a boon to the buildup of household debt in these SEACEN countries. In addition, given that the populations of SEACEN countries are younger than those in developed countries, changes in real interest rates likely had greater effects on household debt accumulation in SEACEN countries than in developed countries.

4.4 Rising Real House Prices

The rise in house prices features prominently as one of the major explanations for the rise in household indebtedness in developed economies. For the SEACEN region, seven countries have published real house prices or equivalent data: Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand. During the 2003-2008 period, the CAGRs of nominal house price indices in the seven countries ranged from a low of 3% for Thailand to a high of 10% for the Philippines, with a simple average of 6%. While the number is impressive, it

is worth noting that it is below the 10% average CAGR for nominal household debt for this set of countries.

Figure 4
Real House Prices in Selected SEACEN Countries
(Index, 2003 = 100)



Note: Taiwan (Sinyi Housing Price Index); Singapore (Private Property Price Index); Philippines (Colliers' Makati Residential Capital Values); Malaysia (NAPIC House Price Index); Korea (Kookmin Bank's Housing Purchase Price Index); Thailand (GHB SDH with Land Index); Indonesia (Bank Indonesia House Price Index)
Source: country papers; non-participating country survey; WEO; Author's calculation

More importantly, when it comes to the level of household indebtedness, what matters is real house prices rather than nominal house prices. Here the data paint a much less upbeat picture (Figure 4). Only the Philippines, Singapore, and Taiwan saw significant increases in real house prices during this period. In Korea, Malaysia, and Thailand, real house prices were rather flat while in Indonesia real house prices had been dropping throughout the period. Consequently, one cannot say that rising real house prices were a general trend in SEACEN countries during the study period.

Finally, when one compares the movements in real house prices in these seven countries to the changes in the ratio of household debt to GDP in Table 2, there even seems to be some negative correlation. Singapore, whose real house prices grew the second fastest, experienced a decline in the debt-to-GDP ratio while Indonesia, with continual real house price declines, experienced strong increases in the debt-to-GDP ratio.

Home Ownership

Since housing purchase is a major reason for households to borrow, the extent of home ownership is certain to play a role in the determination of household debt. Indeed, Hamilton (2003) finds that a large share of the increase in aggregate household indebtedness in the United Kingdom can be explained by an increase in home ownership. Unfortunately, data on home ownership in SEACEN countries do not lend themselves to such time series analysis.

Nevertheless, the available data do shed some insights. According to the Cambodia country paper, most Cambodians own homes. Cambodia's situation is not unique. The percentage of home ownership is high across the SEACEN region. The World Bank's World Development Indicator Database which reports data from individual country's census between 1999 and 2001, has home ownership rates for five countries: Nepal (81%), the Philippines (83%), Sri Lanka (70%), Thailand (81%), and Vietnam (95%). The database also shows the corresponding figures around the same period for the U.K. and the U.S. at 66% and 57%, respectively. Thus to a certain extent, it is not a surprise to note that the mortgage markets in SEACEN countries are significantly smaller (measured relative to GDP as well as to total household loans) than those in the two developed economies. In fact, it is unlikely that the mortgage markets in SEACEN countries will reach the same levels as those in the U.K. and the U.S. today.*

The data on home ownership also gives a clue as to what is behind Singapore's declining household debt to GDP ratio. According to the Singapore Department of Statistics (2005), Singapore's home ownership rate in 2003 was very high at 92.6%. Thus the country's demand for first-time housing purchases is limited albeit with the favourable macroeconomic and financial environment. This suggests that the fall in Singapore's household indebtedness during the study period was a result of a demand constraint.

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* This does not necessary mean that growth potential of the mortgage markets in SEACEN countries is limited. Aside from the effect of higher house price, going forward, the average sizes of households in SEACEN countries are likely to become smaller which means greater demand for housing. However, such a demographic change takes time.

4.5 Econometric Results

The discussions thus far focus on the individual factors separately. Table 7 reports the results of pooled OLS regressions of the ratio of household debt-to-GDP on different combinations of log nominal GDP (PPP) per capita, real house price, the real lending rate, inflation, and the nominal lending rate. Here, the variable log nominal GDP (PPP) per capita is taken not only as the level of a country's well-being, but also as a proxy for the country's degree of financial market flexibility on the supply side. The estimation covers six countries with available house price data with the exception of Singapore, namely, Indonesia, Korea, Malaysia, the Philippines, Taiwan, and Thailand, for the period from 2003 to 2008, for a total of 36 observations. The limited data points render pooled regression the most appropriate option for the modeling purpose.

Table 7
Estimation Results from Pooled Regression of the Debt-to-GDP Ratio on Potential Explanatory Variables

	(1)	(2)	(3)	(4)
Log Nominal GDP per capita	19.5128***	19.6367***	19.6024***	19.5747***
	(9.974)	(10.03)	(9.709)	(9.937)
Real housing price index	-0.1977	-0.1948	-0.2022	
	(-1.210)	(-1.185)	(-1.193)	
Real lending rate	-2.9525***			-2.6220***
	(-3.386)			(-3.144)
Inflation	-4.2403***	-1.3873*		-3.9427***
	(-6.185)	(-1.739)		(-6.117)
Nominal lending rate		-2.7406***	-3.6830***	
		(-3.309)	(-5.703)	
Constant	-66.0596**	-68.2314**	-65.7368**	-89.5012***
	(-2.359)	(-2.441)	(-2.283)	(-4.392)
Observations	36	36	36	36
Adjusted R-squared	0.935	0.934	0.930	0.934
F	126.1	124.5	155.2	165.3

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In general, the regression results concur with the earlier discussions. All regression coefficients except that of real house price are significant and are of the expected signs. Despite strong economic growth and falling real interest rates in the six sample countries, rising inflation and nominal lending rates served to hold down increases in household indebtedness while changes in real house

price appeared unrelated to the dynamics of the household debt-to-GDP ratio during the study period. Quantitatively, a 1%-growth in nominal GDP (PPP) per capita is associated with an increase of the household debt-to-GDP ratio by 0.2 percentage point which may be regarded as the underlying trend growth in household indebtedness. A 100-basis point reduction in the real and the nominal lending rate boosts the ratio of household debt to GDP by about 3 percentage points while a reduction of the inflation rate by the same magnitude increases the ratio by about 4 percentage points.

4.6 Individual Country Results

Three of the five country papers (the Philippines, Taiwan, and Thailand) contain time series estimation of household debt evolution in the respective countries. The data used in the country estimations are in quarterly frequency and cover a longer period than the above panel data estimation. The three papers also use the amount of household debt as the dependent variable as opposed to the use of the ratio of household debt to GDP in this chapter.[5]

In both the Taiwan and the Thailand studies, an estimated error correction model is employed. In the Taiwan study, the dependent variable is the log real household debt while in the Thailand study, the log real consumer loans is used. For Taiwan, it is found that the long-run dynamics of real household debt is governed by real house price, the housing stock, the unemployment rate and the nominal lending rate while changes in real household disposable income also matter for the short-run dynamics.

For Thailand, farm price and real GDP explain most of the variation of real consumer loans in the long-run. The significance of farm price as an explanatory variable may be due to the fact that a little below 40 percent of Thai households are agricultural households. For the short-run estimation, changes in house price and lagged consumer loans also play a role.

Due to a shorter data set, an OLS regression methodology is chosen for the case of the Philippines (the Philippines data set is from 2001 Q1 to 2009 Q1 whereas the Taiwan and the Thailand data sets are from 1997 Q2 and 1998

5. In other words, the country researchers are interested in modeling the evolution of household debt while the integrative chapter is interested in modeling the evolution of household indebtedness which is more customary in the literature. The country researchers' modeling strategy was motivated by an attempt to have some linkages between a household NPL model and a household debt model in a way that a stress test can be performed without assuming path of household debt that may be inconsistent with assumptions on other macro and financial variables.

Q3, respectively, to 2009 Q2). In this case, however, three dependent variables are used: credit card loans, residential real estate loans, and total household loans, all in nominal terms. Household consumption, as measured by private consumption expenditure (PCE), is found to be the most important explanatory variable for all three cases. The nominal lending rate has a significant effect on credit card and residential real estate loans, but not on total household loans.

In terms of the overall goodness of fit, the three estimated models are no different than the long-run equations in the Taiwan and the Thailand cases where over 90 percent of the variations of the dependent variables can be explained. Nevertheless, the results for the Philippines highlight the fact that aggregate household loans may behave differently from the individual components and that in a more rigorous exercise, regressions of different loan types should be pursued. Without the estimation results of credit card and residential real estate loans, one may conclude wrongly from the estimation results of total household loans, that the lending rate is irrelevant to the determination of household debt in the Philippines.

5. Implications for Financial Stability

How severe household indebtedness may affect financial stability basically depends on two considerations – the ability of households to service their debts and the exposures of the financial system (not just commercial banks') to household debt. In the U.S., banks thought they were safe because they had off-loaded household credit risk through securitisation, only to see the risk remain in the form of market risk through their exposures to the ABS and the CDO assets.

5.1 Financial System's Exposure to the Household Sector

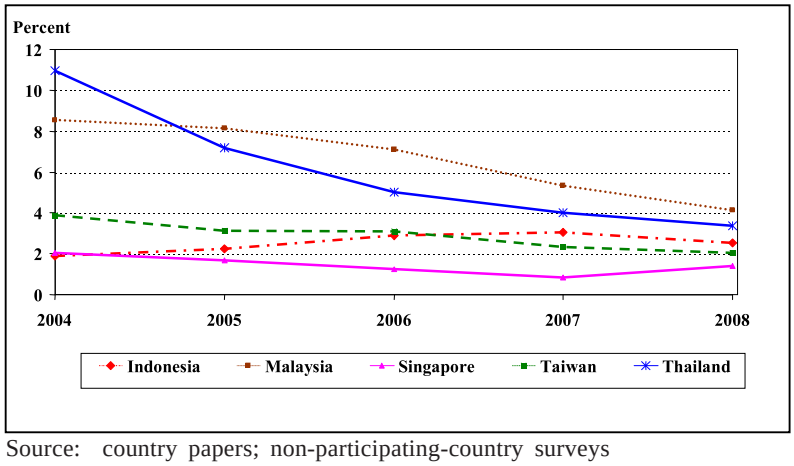
In the SEACEN region where the securitisation markets remain miniscule with an exception of Korea, there is little worry about capital market exposure. In light of data unavailability, only exposures of commercial banks will be examined in this integrative report and the country papers. Given that commercial banks are the largest formal providers of household loans, this focus is justified. In more comprehensive work, it is important to keep in mind, however, that other types of financial institutions with systemic importance need to be considered as well. In some countries, this would include certain state development banks while in others, it may be the finance companies that need scrutiny. Nakornthab (2006), which looks at credit risk of Thailand's Bank for

Agriculture and Agricultural Cooperatives, provides an example of such assessments.

From Table 5, we know that in most SEACEN countries, commercial banks' exposures to the household sector are low to moderate. Only Korea, Malaysia, and Taiwan have shares of household loans to total loans greater than 40 percent. The low proportions of household loans in the aggregate loan portfolios plus the fact that household loans are generally less risky individually but more diversified collectively than corporate loans, mean that risk to financial stability posed by household loans in SEACEN countries is lower than that posed by corporate loans.

Figure 5 shows commercial banks' non-performing loan (defined as loans more than three months past due) ratios in a subset of SEACEN countries from 2004 to 2008. These ratios are lower than those of total loans (data not shown), reflecting lower credit risk of household loans relative to corporate loans. More importantly, the ratios exhibit a general downward trend which indicates declining household credit risk during the period.

Figure 5
Non-performing Loan Ratios in Selected SEACEN Economies, 2004-2008



Source: country papers; non-participating-country surveys
Note: Singapore's NPL figures were calculated as weighted averages of NPL ratios for housing and professional and private individual loans

Still, compared to the international standard of 2 percent or below NPL ratio in normal times (in which Singapore is a good example), the NPL ratios of the other SEACEN countries, particularly Malaysia and Thailand, appeared somewhat high. Nevertheless, it should be noted that parts of the high NPL ratios in Malaysia and Thailand were legacies of the 1997 Asian financial crisis when NPL ratios in the two countries were in double digits.[6] In terms of delinquency rates (generally defined as one to three months past due; data not shown), which are better indicators of default risk although not of the overall credit quality of the loan portfolio, the situations were closer to international norms.

The composition of household loans/consumer loans also matters greatly for the credit risk of the loan portfolio. In general, the order of increasing default risk is from mortgage loans to household business loans to unsecured personal loans, as reflected by their increasing interest rates. Taking the re-sale value of the collaterals and the time of foreclosure and liquidation which together determine loss given default into account, the expected loss rates also follow the same order. Thus, household loan portfolios loaded with mortgage loans will, in general, be of better quality than household loan portfolios loaded with personal loans. The exception is when there is a bust of a property price bubble that has led to excessive mortgage loan growth and inflated collateral values. This explains why the NPL ratio of mortgage loans in Thailand is higher than those of other consumer loans even though their delinquency rate has been the lowest for quite some time.

Against this backdrop, banks in the Philippines appear most vulnerable in terms of household credit risk, as their household loan portfolios are loaded by non-mortgage loans (Figure 1). The situation is further aggravated by the fact that the rate of consumer credit defaults in the Philippines almost triples the average in Asia (Estayo, 2008). In light of these observations, it is not a surprise to note that Bangko Sentral ng Pilipinas is keen on establishing a credit bureau to improve discipline in the credit market as well as launching the country's first consumer finance survey to address the consumer credit data gap (Tan, 2008).

5.2 Household Debt Service Ability

This subsection looks at two key indicators of household debt service ability. The first is the debt-to-financial-asset ratio which is a measure of household

6. Indonesia, the other country in this sample that was also affected by the 1997 crisis, did a better job at cleaning up banks' balance sheets.

leverage. The second is the debt service ratio, defined as household debt payment to disposable income, which is a measure of household debt service obligations. Due to data availability, only a small subset of SEACEN countries can be examined. Tables 8 and 9 presents the evolution of the two indicators in these SEACEN countries along with those in benchmark developed economies from 2003 to 2008. Table 9 also reveals that the debt service ratio is the hardest indicator to acquire, with only five SEACEN countries reporting the data.

It is important to keep in mind before we proceed that the numbers reported in Tables 8 and 9 are averaged figures. Typically, debt burden falls disproportionately harder on low-income borrowers which also have few, if any, financial assets. Thus, the numbers may mask the extent of the risk facing the economies.

Table 8
Household Debt to Household Financial Assets Ratio, 2003-2008

	2003	2004	2005	2006	2007	2008
Indonesia	20.8	25.4	30.4	30.5	33.2	36.5
Korea	48.0	47.0	45.8	46.8	46.2	50.9
Malaysia	39.4	40.0	42.1	40.3	36.8	42.0
Philippines	12.9	15.9	20.2	20.0	19.9	
Singapore		38.3	35.7	32.0	30.0	32.3
Taiwan	21.8	22.1	22.0	20.9	20.0	
Thailand	36.4	35.9	40.3	41.1	39.4	42.7
UK	18.0	18.5	18.1	18.6	18.7	20.3
US	27.9	28.0	28.0	27.8	28.2	34.1
Japan	27.5	27.0	25.5	25.3	24.9	26.3
Australia	15.6	16.7	17.4	17.4	17.3	19.9

Source: country papers; non-participating-country surveys; Federal Reserve Board; Financial Stability Reports of Australia, and the U.K.

Table 8 reveals a striking fact. Households in Indonesia, Korea, Malaysia, and Thailand appear more leveraged than the "over-extended" western households. For US$1 of financial asset, households in the four countries, on average, take on more than 40 cents of debt compared to twenty-some cents for the four benchmark developed economies. In terms of movement, the ratio is increasing in Indonesia, the Philippines, and Thailand, roughly stable in Korea, Malaysia, and Taiwan, and declining in Singapore.

The high debt-to-financial-asset ratios in several SEACEN countries reflect in part the tendency for SEACEN households to have most of their assets in the form of real assets, of which the majority are real estates. If total assets are used in place of financial assets, the situation would appear less overstretched. For example, Thailand's ratio of household debt-to-total assets is 12 percent while Indonesia's is a marginal 2 percent. Nevertheless, given that real assets are generally much more difficult to liquidate than financial assets, households are still vulnerable to shocks even though they may be solvent,

Table 9
Household Debt Service Ratios, 2003-2008

	2003	2004	2005	2006	2007	2008	Notes
Indonesia	1.3	1.4	1.7	1.6	1.5	1.5	interest payment only
Korea						8.0	interest payment only
Malaysia	44.7	38.4	41.3	39.2	41.2	39.6	principal and interest payment
Thailand						23.1	principal and interest payment
Taiwan	42.7	46.0	48.4	46.0	43.4	41.8	principal and interest payment
Australia	8.9	9.9	10.6	11.4	12.6	11.5	interest payment only
UK	6.7	8.6	8.9	9.8	10.7	9.5	interest payment only
US	17.9	17.9	18.4	18.6	18.8	18.6	principal and interest payment

Source: country papers; non-participating-country surveys; Federal Reserve Board; Financial Stability Reports of Australia, Korea, and the U.K.

Still, one cannot look at Table 8 in isolation. From Table 2, it is recalled that Indonesian household debt-to-disposable-income ratio, while growing strongly, was still below 10 percent as of 2008. This means they can easily take on even more debt. The light debt burden of Indonesian households is confirmed by Table 9 which shows that the ratio of interest payment on loans to household disposable income in Indonesia households is 1.5 percent compared to 8 percent in Korea and roughly 10 percent in developed economies.

To have a more complete picture of household debt service obligations, we need to add principal repayment on top of interest payment before dividing by disposable income. This is because the interest-only debt service ratio may provide a misleading picture of household debt burden in a low interest rate but high debt environment. In this case, the benchmark for comparison is the U.S. financial obligations ratio published by the Federal Reserve. Here it should be noted that the debt service ratios for both Malaysia and Taiwan are strikingly high at roughly 40 percent, more than twice the level of the U.S. and Thai ratios and higher than a general rule of thumb of a 30-percent ceiling on the ratio of debt payment to income.

Given that the average lending rates in Malaysia and Taiwan are not that different than those in Thailand and the U.S., the bulk of the difference must come from principal repayments. A potential explanation for high principal repayment is the absence of a long-term debt market. However, this explanation is not borne out by the data, for the common mortgage term in both Malaysia and Taiwan is 25-30 years, no different from those in Thailand and the U.S.

A deeper investigation offers a solution. Both Malaysia's and Taiwan's figures are calculated from total household loans which include sizeable amounts of loans to households for business purposes whereas the U.S. figure does not.[7] In the case of Taiwan, about 75 percent of principal and interest payments come from one-year working capital loans which effectively bias the debt service ratio significantly upward. Excluding these loans, Taiwan's debt service ratio would be lower than that of the U.S.

6. Policy Implications

Drawing from the findings in this chapter and the country papers, this section discusses four implications regarding household indebtedness and financial stability for SEACEN policymakers.

6.1 Balancing Costs and Benefits of Increased Household Indebtedness

Increases in household indebtedness have many benefits. Many supervisors tend to view robust increases in consumer loans with skepticism. While the concern is well placed, they tend to overlook the fact that parts of increases in consumer loans, or household debt more generally, are natural consequences of economic development and financial deepening. In fact, too low debt-to-GDP ratios and too low household loan penetration rates reflect a country's financial underdevelopment.

Increased household indebtedness improves the quality of life of many households by making consumption smoothing and housing purchases easier. It also contributes to portfolio diversification and improved profitability of the banking sector. Over the longer term, greater household financial access is closely associated with economic growth (Townsend and Ueda, 2006). In the present post-crisis context, a robust household financial market will also facilitate a shift towards domestic demand that will help growth rebalancing.

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7. The Thai figure also encompasses business loans but debt to disposable income in Thailand is lower than Malaysia and Taiwan.

In light of these benefits, greater household debt access should be encouraged and financial innovations such as new consumer finance products and the securitisation of household debt should be promoted. The recent global financial crisis has given a bad name to securitisation and stalled the region's nascent securitisation market. However, the criticism has been mostly on complex securities such as CDOs and ABCPs. Plain-vanilla, pass-through products will be beneficial for mortgage and consumer loan market deepening as well as risk management of financial institutions.

On its downside, excessive household indebtedness puts significant strains on households' balance sheets and debt service capacity particularly when interest rates and/or unemployment are on a rise. In addition, a rapid, above-trend increase in housing loans is generally an important factor fuelling a harmful property price bubble. Given these negative repercussions, policymakers will need to strike a balance between greater household credit access and heightened threats to financial stability. This leads to the rest of the policy implications

6.2 Enhancing Household Debt Information

The ability to detect and assess the threats to financial stability arising from developments in household debt early on depends critically on the availability of timely and comprehensive information on household debt. Three areas of data enhancement – centralised household credit information system, better loan categorisation, and micro (household-level) data – make up a priority list for improved surveillance in the SEACEN region.

The importance of centralised credit information is vividly illustrated by the episodes leading up to Thailand's 1997 financial crisis and Korea's 2003 credit card crisis. In the Thai case, incidences of "double mortgages" where a single property was used as collateral for borrowings from more than one financial institution were parts of the destructive real estate market bubble. In the Korean case, many multiple credit card holders used proceeds from one card to pay off another card's debt. These incidences could have been prevented had a centralised credit information system existed then. In countries that have established centralised credit information systems in the form of credit bureau or credit registry, borrower information is routinely used for loan screening. For policymakers, such a system also provides information on the exposure of the banking system, or of the financial institution system more broadly, to a particular household segment and its quality.

Finally, depending on the extent of data sharing, the vast data collected by the centralised credit information system can be used to improve the quality of financial institutions' household credit risk assessment and household credit risk modeling. Given that several SEACEN countries now have credit bureaus or credit registries in operation for a while, much can be gained from knowledge and experience sharing between countries with and without such a system in place.

Data collection for this study reveals the need for expanded loan categorisation for a number of SEACEN countries. This issue goes beyond the existence of household loans for non-consumption purpose. Even within the scope of consumer loans, publicly available data in a number of countries do not have sub-categorisation or only distinguish between mortgage loans and non-mortgage loans. Even in countries that do have finer loan classification, the data on non-performing loans are available only for aggregate consumer loans. For certain countries, this is just a matter of public disclosure. Conversely in a few countries, the data simply do not exist.

Having finer data classification is important for financial stability analysis because different loan sub-categories may have different determinants, as illustrated by the Philippines country paper, different payment patterns (fixed or adjustable monthly payments, short or long maturity, for example), as well as different underlying risk factors. For example, mortgage default is more sensitive to house price boom-bust cycles than credit card default.

Finally, an analysis of household debt vulnerability based solely on aggregate data may mask important information regarding the distribution of leverage and debt service burden across households. This calls for the use of micro data where variables such as debt-to-income, debt-to-asset, and debt service ratios can be matched to household income levels, occupations, age groups, and so on. For example, using such data, Thailand's country paper shows that even though Thai households on average are financially sound; low-income and less financially literate households are more likely to experience financial difficulties in times of economic shocks as their debt service ratio is more than twice as high as the average debt service ratio calculated from the aggregate data.

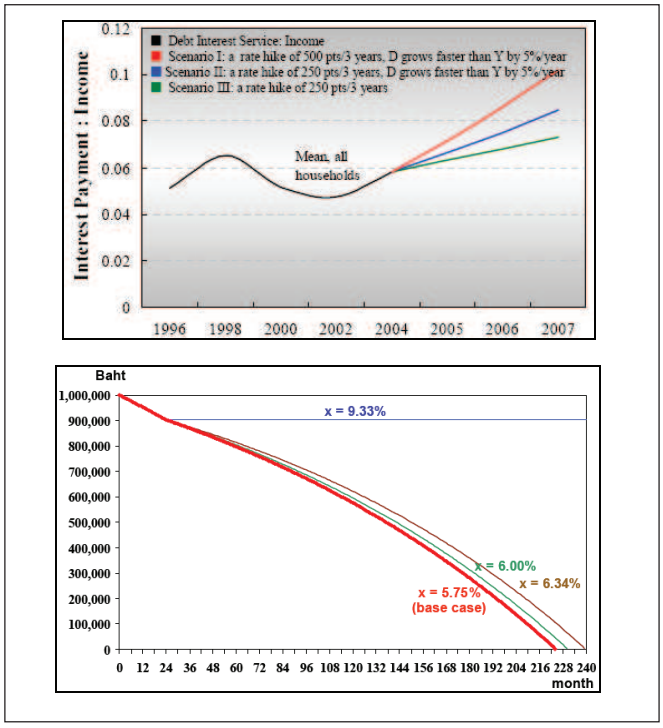
Beyond the three aforementioned areas of data enhancement, analysis of household debt can be greatly improved with relevant data collection. Such data include, but not limited to, household assets, delinquency rates, loss-given default, and various loan characteristics. A good example of the latter is Coleman et al. (2005) which maps mortgage default probabilities across variables such as the original loan-to-value ratio, loan age, and loan types (owner-occupied, investment, mortgage-insured, and large loans).

6.3 Strengthening Household Credit Risk Assessment

Because the market cannot always be counted on for accurate risk assessment, authorities with concerns for the maintenance of financial stability need to have some tools for vulnerability assessment of the household sector. At the minimum, the NPL and the delinquency rates of household loans of different types should be monitored regularly along with the behaviours of these loans relative to their trends. While up-to-date (in many countries, data on new loans, NPLs, and delinquencies are available to supervisors in quarterly, if not monthly, frequency and with only short time lags), these data are backward looking in nature. Two policy tools – sensitivity or scenario analysis and stress testing – offer ways for policymakers to get a glimpse into the future.

Scenario analysis is basically a broad term that encompasses both single-factor and multi-factor sensitivity analyses. Properly done, multi-factor sensitivity analysis must take into account the interactions among factors so that the assumed scenario is a coherent, realistic one.

Figure 6
Sensitivity Analyses of Household Loans



Source: Ariyapruchya et al., 2004; Nakornthab et al. (2004)

Examples of single-factor sensitivity analysis of household debt are shown in the two panels of Figure 6, taken from Ariyapruchya et al. (2004) and Nakornthab et al. (2004), respectively. Both analyses were carried out to answer in part the Bank of Thailand's concern on the effect of an uptrend in the policy interest rate at the time. In Ariyapruchya et al. (2004), the focus was on the effect of interest rate increases on households' interest service burden. In Nakornthab et al. (2004), the focus was on the sustainability of commercial banks' mortgage payment contracts. In Thailand, mortgage payment terms are in fixed-amount monthly payments, most with low "teaser" fixed interest rates in the first couple of years and variable floating interest rates thereafter. As interest rates increase, a higher proportion of monthly payments will go into interest payment, leaving a smaller proportion for principal repayment. If interest rates are high enough, the sum of the fixed monthly payments over the loan life may not cover the original loan amounts. The right panel of Figure 6 traces time profiles of outstanding loan principal under different levels of interest rates for a hypothetical mortgage contract. The finding then was that most mortgage contracts on the market could withstand about 100-basis-point increases in reference lending rates without the need for contract extension or additional payments.

Stress testing is a special case of scenario analysis, with the assumed scenario being an extreme but plausible one. Like multi-factor scenario analysis, effective stress testing requires a sound empirical model that links a variable of interest to relevant risk factors. In bottom-up stress testing, the assumed scenario(s) are given to financial institutions by supervisors. The collected results are generally used to gauge vulnerabilities and capital shortfall of individual institutions as well as systemic vulnerabilities. Top-down stress testing is performed by supervisors using aggregate system-wide data. The results are generally coarser, but the analysis entails fewer data requirements and, therefore, can be done quickly. The Taiwan and the Thailand country papers feature such top-down analyses. Both the bottom-up and the top-down approaches complement each other and should be carried out regularly.

6.4 Macro-prudential Regulation and Supervision

The recent global financial crisis highlights the importance of macro-prudential regulation and supervision for the maintenance of financial stability. Broadly speaking, macro-prudential policy differs from traditional micro-prudential policy in that its concern is on the system as a whole rather than on individual institutions. Otherwise the underlying tools are similar. In fact, most of macro-prudential instruments currently in use and proposed thus far are adaptations,

re-calibrations, and re-orientations of existing micro-prudential instruments (Bank of England, 2009)

Assessments of household-sector credit risk in the preceding policy implication are an essential part of macro-prudential policy, but there are others. The most commonly used macro-prudential tool at present is loan-to-value ceilings on mortgage loans with an objective to guard against the buildup of imbalances in the mortgage market in times of booming property prices. Other examples include a cap on maximum loan amounts and minimum income requirements for credit card holders. In addition, qualitative tools such as Basel II pillar-2-type actions and moral suasion may also be used to take care of systemic concerns. Finally, the household sector section in financial stability reviews/reports serves as a public communication tool for central banks to articulate their views on financial conditions of the household sector.

7. Concluding Remarks

The recent global financial crisis has prompted a closer look at the development of household debt in the SEACEN region and its potential impacts on member countries' financial stability. The evidence and the analysis of this chapter suggest that the threat of a household-debt-induced instability in this part of the world is remote. Most importantly, the levels of aggregate household indebtedness in SEACEN countries do not appear excessive relative to their economic fundamentals. At the same time, the shares of household loans in total bank loans are low to moderate in general. Finally, there have been no signs of significant household debt service problems during the study period. While these conclusions are based on data between 2003 and 2008, they are likely to hold to present in light of the fact that the global financial crisis did not have significant impacts on household employment in SEACEN countries, while causing banks to be cautious about their credit risk exposures on top of the low interest rate environment in 2009.

Nevertheless, regional policymakers cannot afford to be complacent, but need to remain vigilant against increases in household indebtedness and financial institutions' household credit risk. This is because a number of forces are likely to contribute to strong increases in household indebtedness and increased household balance sheet vulnerability in the period ahead. First, post-crisis economic recovery will provide support for further household debt accumulation. Second, given the low-to-moderate share of household loans to total bank loans, there is much room for further increases. Third, with house prices poised for a fresh new up-cycle, robust growth in mortgage loans is expected. Fourth, continued

financial innovations and the region's adoption of the Basel II Accord which favours consumer loans over unrated corporate loans will further tilt bank loan portfolios towards household loans. Finally, against the expected increase in household debt relative to household income will be the uptrend in interest rates associated with the normalisation of monetary policy stances in many countries. All of these highlight the need for close monitoring of the household sector's financial position as well as for sound prudential regulations and supervisory oversight to ensure that the risk to financial stability posed by the sector is well contained.

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Appendix 1

SEACEN Survey:
Household Indebtedness and Its Implications for Financial Stability

Please denote N/A wherever the requested data is not available.
For Table 1 and 2, if your country does not have data on total household debt, please use financial institutions data for consumer loans (loans to individuals for non-business purposes).

1. Basic household debt data (if use consumer loans, please indicate)

	2003	2004	2005	2006	2007	2008
Average amount of household debt per household (in local currency)						
Ratio of households with debt to total households						
Ratio of household debt to GDP						
Ratio of household debt to household disposable income						
Ratio of household debt to household assets						
Ratio of mortgage debt to total household debt						
Household debt service ratio 1 (Ratio of interest payments to household disposable income)						
Household debt service ratio 2 (Ratio of interest payments plus principal repayments to household disposable income)						

2. Break down of the sources of household debt (if use consumer loans, please indicate)

	2003 or closest year	2008
Commercial banks (in million MNT)		
Government development or specialised financial institutions		
Other financial institutions		
Informal sources (friends, relatives, money lender, loan sharks)		
Others (please indicate)		

3. Home ownership data

	2003	2004	2005	2006	2007	2008
Percent home owners						
Ratio of average house price to average household income						

4. Macro and financial variable data

	2003	2004	2005	2006	2007	2008
GDP (in million MNT)						
Headline inflation rate						
Unemployment rate						
House price index						
Mortgage rate						

5. Commercial bank loan data

	2003	2004	2005	2006	2007	2008
Total commercial bank loans (in million MNT)						
Consumer loans as percent of total loans						
Housing loans as percent of total loans						
Credit card loans as percent of total loans						
Other personal loans as percent of total loans						
NPL rate (total loans)*						
NPL rate (business loans)						
NPL rate (consumer loans)						
NPL rate (housing loans)						
NPL rate (credit card loans)						
NPL rate (other personal loans)						

Note: * total loans.
Consumer loans = housing (mortgage) loans + credit card loans + other personal loans
NPL rate = loans past due for more than 90 days in a particular category/total loans in that category
If your data do not conform to the above definitions, please indicate their underlying definitions.

6. Please list major government policies related to household debt and/or household financial access that were introduced during the 2003-2008 period

_____

_____

_____

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_____

_____

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PART II:
COUNTRY CHAPTERS

CHAPTER 2

HOUSEHOLD INDEBTEDNESS AND ITS IMPLICATION FOR FINANCIAL STABILITY IN CAMBODIA

By

Mao Sokanyn[1]

1. Introduction

Since data on household debt is not available in Cambodia, this study uses loan to personal consumption from the banking system as a proxy of Cambodian household debt.

Since 2005, loan to personal consumption have shown an increasing trend which suggests that economic activities are considerably high and people have more confidence in the banking system.

During the period from December 2007 to June 2008, loan to personal consumption increased by around 40%. However, this loan is about 10% of total loans.

From the standpoint of the central bank, household debt measured by loan to personal consumption hitherto has not been important to the economy as a whole. Given the recent low rate of non-performing loans and the small proportion of loan to personal consumption to total loans, the household debt in Cambodia is not as serious an issue as compared to the experience of Thailand where it is considered to be one of the financial imbalances monitored by the Bank of Thailand.

So far, the issue of household debt has not been featured on the front page of newspapers or magazines or monetary announcements. To date, the central bank has not issued any policy on household debt.

It is a custom for Cambodian people to live with their parents until they get married, and most stay in until they have children. There is no incentive for

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1. Deputy Section Chief, Economic Research and Statistics Department, National Bank of Cambodia.

them to get loans from banks or from other financial institutions to buy houses or housing facilities because they can reside in their parents' homes. It explains why loan to personal consumption is only a fraction, just about one tenth of total loans to the private sector.

2. Literature Review

To date, researchers have not paid attention to household debt in Cambodia. No studies have been carried out in this area not that it is not meaningful, but it so happened to be the least important, since the banking system in Cambodia is still in the early stage of development as compared to the banking system of neighboring countries.

3. Facts about Household Debt in Cambodia

Related to the household debt in Cambodia, there are two reasons telling why household debt was not taken into consideration for the financial imbalance and its impact to financial crisis: (1) the amount of household debt is small and (2) the data from the demand side is very difficult to collect. Households are reluctant to volunteer any information related to their financial status. They would withhold financial information to protect their safety. When they do disclose, they would deliberately understate the information. Even though the surveyors assure the household respondents that the information provided will be kept confidential, they would still not disclose true information, according to Cambodia Socio-Economic Survey 1997.

This discourages the conduct of surveys from the demand side. We do not know whether the 2001 and 2004 Cambodia Socio-Economic Surveys will disclose the data on household debt.

Given the unwillingness of household members to reveal their financial information and insignificance of the household indebtedness in the Cambodia Economy, it is likely that the surveys will not produce much data on household debt.

It is estimated that the total number of households in Cambodia was 2,188,663 in 1998, of which 179,000 was in Phnom Penh, 202,000 was in other urban areas and 1,807,663 was in the rural sector.

The average household size in Phnom Penh and other urban areas was estimated at 5.2 persons per household, whereas in the rural areas it was 4.9 persons per household, according to Cambodia Socio-Economic Survey 1997.

3.1 Aggregate Trends (Time Series)

Figure 1
Debt Indicators

Debt Indicators	Dec-05	Dec-06	Dec-07	Dec-08
Loan to personal Consumption include: personal lending, credit card, mortgage loans (billion Riel)	123.379	140.906	714.74678	1036.7081
Nominal GDP (billion Riel)	25,978	29,544	34,451	42,069
HHs Debt to GDP	0.5%	0.5%	2.1%	2.5%
Total # HHs (1998) (billion)		0.002188663		
Avg HHs debt (billion Riel)	56371.858	64379.943	326567.76	473671.88
Avg yearly HHs income (1999) (billion Riel)		0.007875304		
Aggregate HHs income (1999) (billion Riel)		17,236		
Aggregate Debt to Income* Ratio	0.7%	0.8%	4.1%	6.0%

*. Income taken in 1999 for Dec-05-08 Debt

Source: Financial Year Book 2008 & Bank supervision of NBC

3.1.1 Household Debt to GDP

Household debt, which is measured by loan to personal consumption, to GDP is within 0.5-2.5% interval during the period of December 2005-2008. This shows household debt plays a small role in economic activities, due to: (1) Lack of confidence in the banking system, and (2) People do not have much demand for loans to buy houses and engage in other consumption.

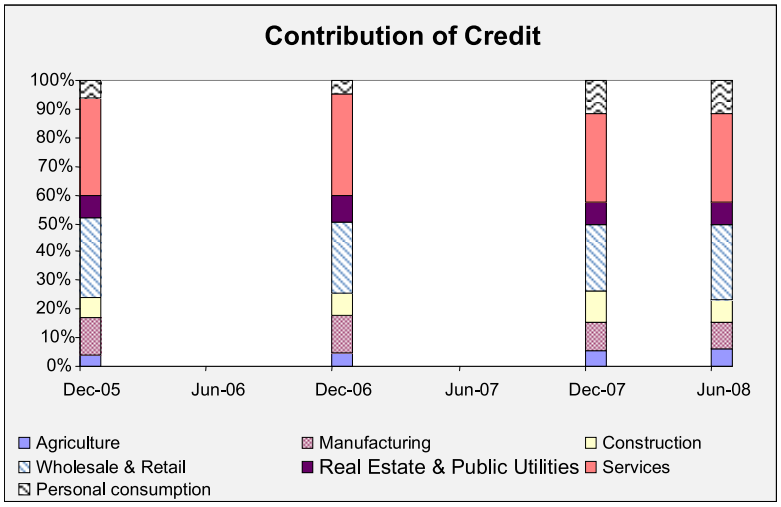
Figure 2
Contribution to GDP by Sector

% contribution	Dec-05	Dec-06	Dec-07	Jun-08
Agriculture	3.0	4.3	4.9	5.9
Manufacturing	11.3	11.8	10.0	8.8
Construction	6.3	7.7	10.2	7.0
Wholesale & Retail	23.2	22.6	21.9	24.4
Real Estate & Public Utilities	6.4	8.6	7.9	7.0
Services	29.1	33.0	28.8	28.9
Personal consumption	5.4	4.1	11.4	11.2

Source: Bank supervision of NBC

As can be seen from Figures 2 and 3, the sectors which absorbed credit the most are manufacturing, wholesale & retail and service sector, which ranged from almost 9% to almost 30% of total loans of the banking system. The sectors which absorbed credit the least are agriculture, construction, and personal consumption, which ranged from 3% to 10%. Credit to personal consumption showed fluctuated during the period 2005-2008 from between 5 to 11.5 %.

Figure 3
Contribution of Credit



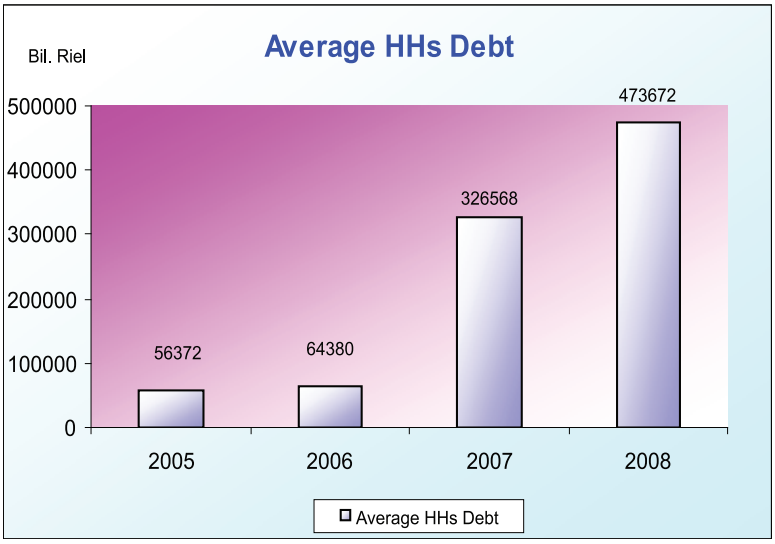
Source: Bank supervision of NBC

It is to be noted that the Cambodian economy surged during the period 2007 and 2008 with all sectors performing well. The government policy in stimulating investment started taking effect as domestic and foreign investments grew significantly. As of June 2008, loan to personal consumption is less than one third the volume of loans for wholesale & retail and services.

3.1.2 Average Household Debt

Average household debt increased since year 2005, due to expansion in credit cards usage, mortgages loans and loans for buying cars. The largest increase in average household debt was in 2007, which was 4 times larger than the corresponding figure in 2006. The year 2007 was a boom year for the economy. It resulted in an increase in FDI, which, in turn, generated a favorable labor market, accompanied by real estate price increase and high income.

Figure 4
Average Household Debt

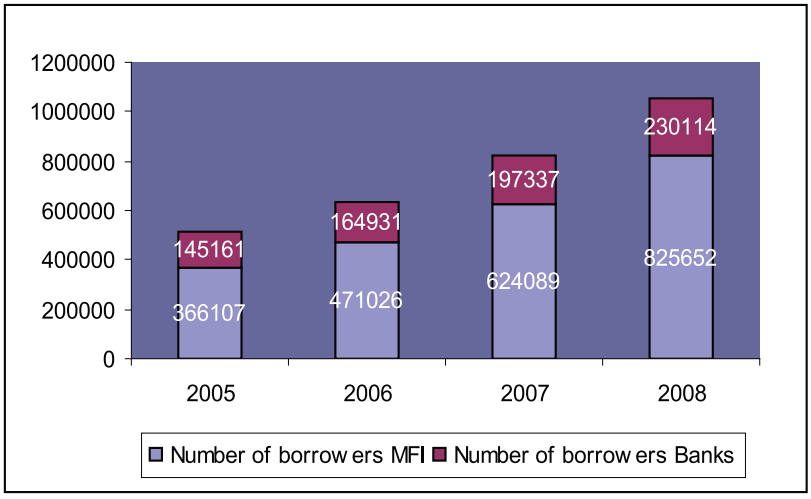


Source: Financial Year Book 2008

3.1.3 Debt Frequency

The number of borrowers increased by 16% in 2008, due to significant demand for credit by every sector of the economy for development as a result of the economic boom. Most of the credit expansion was channeled to the wholesale and retail trading sectors, followed by the services sector, which includes mainly hotels and restaurants, telecommunication and media, and other non-financial services. Manufacturing obtained significant bank financing. Commercial real estate, residential real estate and construction also absorbed funds from the credit expansion. In contrast, credit to personal consumption also increased, but the volume was relatively small.

Figure 5
Number of Borrowers



Source: Bank supervision of NBC

In Cambodia, it is very difficult to collate information on household indebtedness. To date, Cambodia has conducted four Socio-economic Surveys. Three of the surveys disregarded the issue of household indebtedness. We are looking forward to the upcoming fourth publication of the survey in hope that there is something focusing on the subject.

In this study, the number of indebted households is determined by estimation on the supply side, given the number of borrowers in the banking system and contribution of personal consumption to total loans. It means the number of

indebted households is equal to the *total number of borrowers* times *contribution of personal consumption to total loans.*

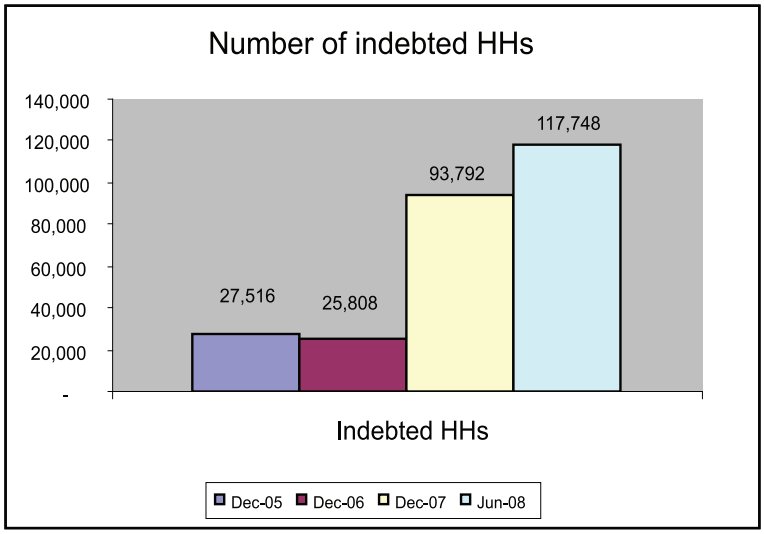
Figure 6
Personal Consumption to Total Loans

	Dec-05	Dec-06	Dec-07	Jun-08
PC contribution to Total loans %	5.4	4.1	11.4	11.2
Number of borrowers MFI	366107	471026	624089	825652
Number of borrowers Banks	145161	164931	197337	230114
Total borrowers	511268	635957	821426	1055766
# HHs	2188663			
Indebted HHs	27,516	25,808	93,792	117,748
Debt frequency (indebted HH/ total HHs)	1.3%	1.2%	4.3%	5.4%

Source: Financial Year Book 2008 & Bank supervision of NBC

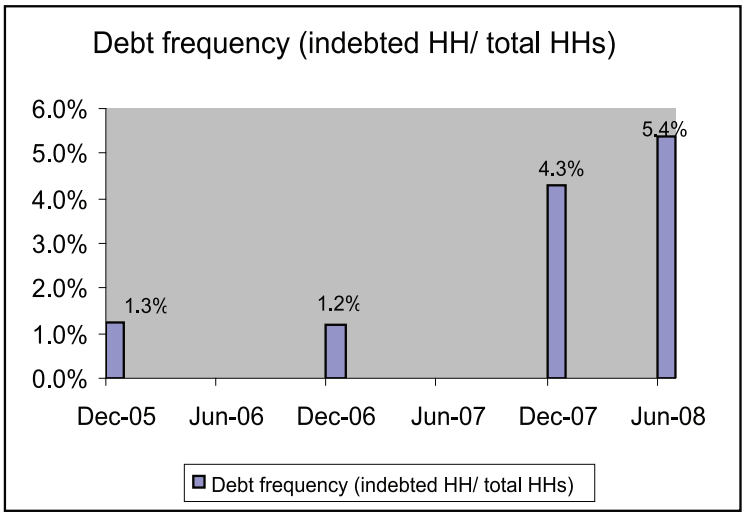
The number of indebted households was 27,516 in December 2005 and increased to reach 117,748 in June 2008. Of the total number of households, the number of indebted households recorded 1.3% in December 2005 and rose to 5.4% in June 2008. The increase might be mainly due to the booming economy during 2007-2008, with high capital inflow (FDI) and full employment, leading to high consumption.

Figure 7
Number of Indebted Households



Source: Financial Year Book 2008

Figure 8
Debt Frequency



Source: Financial Year Book 2008

3.1.4 Aggregate Debt to Income Ratio

The aggregate debt to income ratio shows an increasing trend from less than 1% in December 2005 to almost 6% in December 2008. Because of the unavailability of income data, the 1999 data for income was taken as a proxy for the income data for the period of 2005-2008.

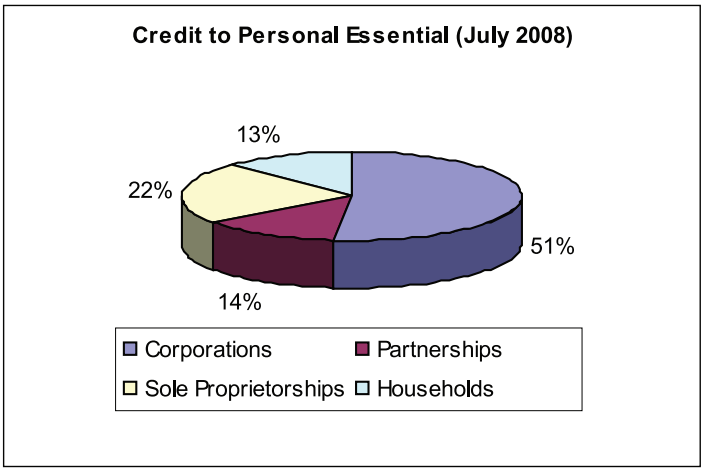
3.1.5 Purpose of Household Debt

This debt refers to loans for buying houses, cars; for businesses, like agricultural implements, or products; and for retail businesses. Before July 2008, loan to personal consumption was called by that name, but since July 2009, it has been renamed "credit to personal essentials," the purposes for which are as defined above, while loan to personal consumption before July 2008 was not clearly classified. This change in data classification is to be noted, and the use in this study of the data for loan to personal consumption before July 2008.

According to the chart on the right, loan on personal essential (consumption) to households made up 13% of the total loans of the private sector which is the smallest contribution, whereas credit to personal consumption to corporations recorded the largest contribution of 51% of the total loans of the private sector.

At the same time, loans to sole proprietorships and partnerships on personal consumption comprised 22% and 14% of total loans of private sector, respectively.

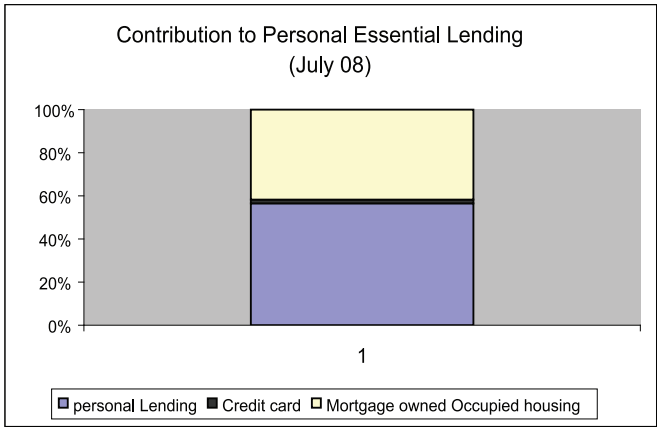
Figure 9
Credit to Personal Essential



Source: Bank supervision of NBC

According to the Figure 10 below, we see loans to personal essential goes to three segments of which 57% goes to personal lending, 2% goes to credit card usage and 42% goes to mortgage owned/ occupied housing.

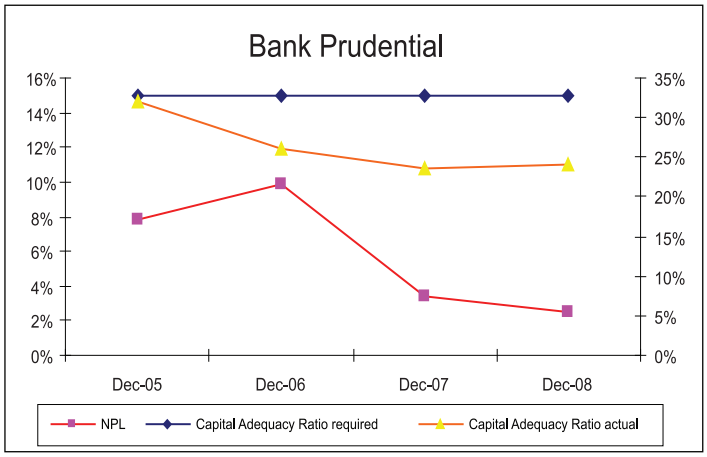
Figure 10
Contribution to Personal Essential Lending



Source: Bank supervision of NBC

From Figure 11 below, the NPL reached a peak of almost 10% in December 2006 and then moved downward to 2.5% in December 2008. The prudential ratio which provides an indication of repayments, is reflected by the higher than required level of actual capital adequacy ratio.

Figure 11
Bank Prudential Data



Source: Bank supervision of NBC

4. Forces behind the Rise of Household Indebtedness

There are some factors behind the increase in Cambodian household debt:

4.1 Demographic Changes

There has been no change concerning the age structure and educational attainment. People still work and get paid as usual.

4.2 Home Ownership and House Price

4.2.1 Cambodian Property Market

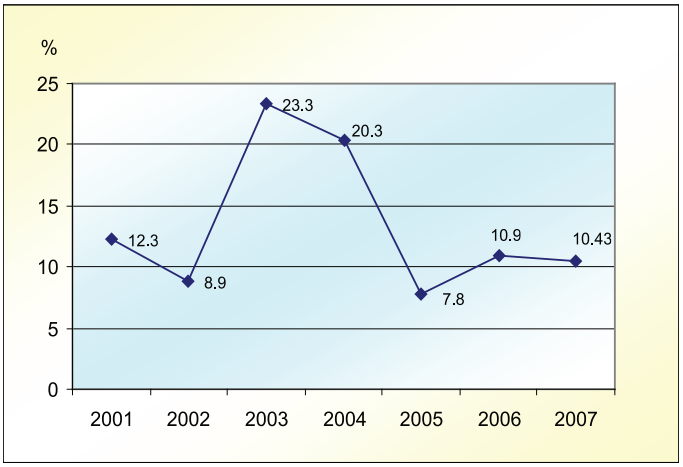
After 40 years of isolation from the rest of the world due to political turmoil, civil war and economic devastation following the Khmer Rouge period, Cambodia is rapidly recovering and realising the economic opportunities that lay ahead.

Whilst the economy is in the early stages of development, there are huge opportunities for investors who are prepared to face the business risks and get in at ground level. Nowhere is the business opportunity greater than in the property market.

Property ownership in Cambodia is very high following the large-scale land distribution made during the communist period of the 1980's. Most families own their own homes. It is in property that most individuals hold the bulk of their wealth. Cambodians have no history investing in property. Land prices have been stagnant for a very long period and demand so low that the opportunities quite simply are not available. This means that land values are based on Cambodians' ability and willingness to buy, and are therefore incredibly low by world standards.

The lack of buying and selling of property in Cambodia does not necessitate a real estate industry. Without a real estate industry, the concept of market value, freely available statistics on sales, demand and supply trends as well as the tools which are available to most property developers around the world simply are not available in Cambodia. This means that there was, and still is, the potential for investors to buy properties that are grossly undervalued and provide huge returns.

Figure 12
Real Estate Growth



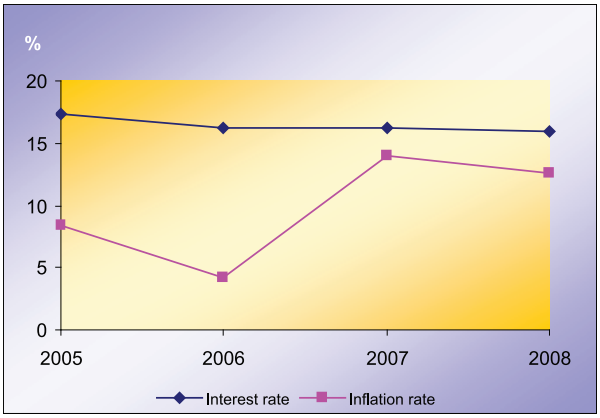
Source: Cambodian Real estate

Over the past six or seven years, investors in Phnom Penh and Siem Reap have been taking advantage of these opportunities and making fantastic returns. Khmers returning from abroad have fuelled a dramatic increase in demand in Phnom Penh, bringing back with them an understanding of the potential value of properties based on tourism trends and economic development, as well as the required capital. This was reflected in the high rate of real estate growth in 2003 and 2004. The average of growth rate during the period under consideration is 13%. Increases in home ownership and house prices over the past year contributed part of the increase in household debt. Capital flowed into the country during the past year mainly to the telecommunication, commercial banking, resort, garment, and construction sector investments and other sectors. These activities pushed up the prices of houses and lands and speculation, and expected investment returns elevated the prices further. (There is no data for home ownership and house prices).

4.2.2 Real and Nominal Interest Rates

As shown in the Figure 13 below, the trend in the average lending interest rate fluctuated modestly downward over the past four years. This movement was attributed to a more competitive environment for banking operations.

Figure 13
Interest Rate on Loans and Inflation Rate



Source: Economic Research & statistics Department of NBC

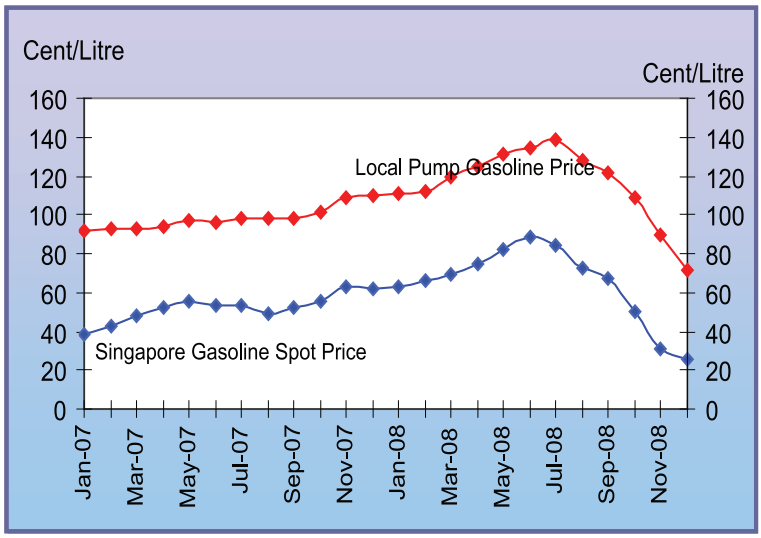
4.3 Inflation Rate

The year-on-year inflation rate fluctuated over the past four years, from 2005 to 2008, reaching the peak of 13.9% in 2007. The highest rate of inflation reached in 2007 was due to increasing oil price and huge capital inflow.

4.3.1 Trends of Singapore and Cambodian Oil Prices

The local oil price hovered at about US$0.92 per liter for the first 4 months of 2007 and started increasing to US$1.10 per liter in December 2007 and reached a peak of US$1.38 per liter in July 2008. This price movement resulted from the increasing world oil price.

Figure 14
Local and International Oil Prices



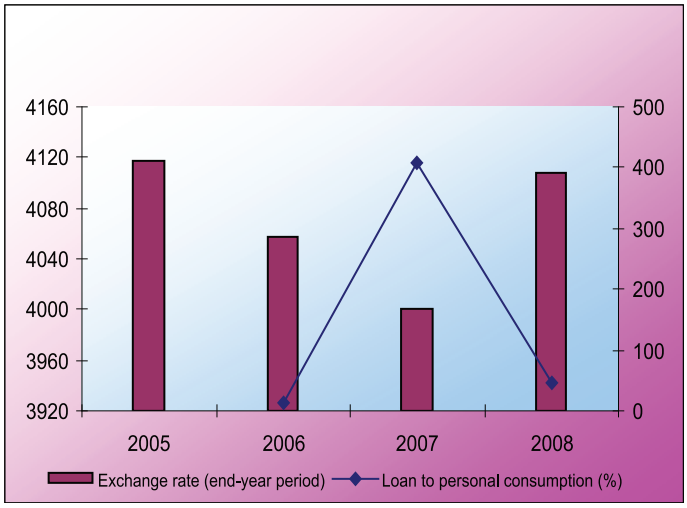
Source: Economic Research & statistics Department of NBC

4.3.2 Exchange Rate

The National Bank of Cambodia has made great efforts in maintaining exchange rate stability which is the crucial economic indicator for Cambodia. The exchange rate movement from 2005 to 2008 was kept within the 4000-4117 interval. The appreciation of the currency (riel) in 2007 was due to the large capital inflow for investment in the construction and tourism sectors. The stronger the currency, the higher the level of business confidence leading to increased

loan to personal consumption, since investment brought higher incomes and expenses.

Figure 15
Exchange Rate and Loan to Personal Consumption



Source: Bank supervision & Research Department of NBC

4.4 Foreign Direct Investment

Foreign direct investment (FDI) increased continuously from 2003 to 2008. The FDI inflows reached the peak in 2007, recording US$867.3 million. The FDIs in 2007 flowed into the following sectors, in ascending order of importance: telecommunication, commercial banking, garment, and others, which included construction, agriculture, and tourism sectors.

Figure 16
Foreign Direct Investment

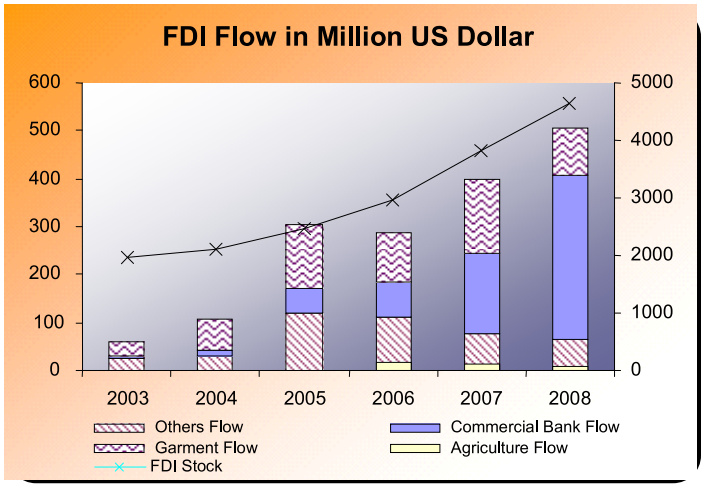
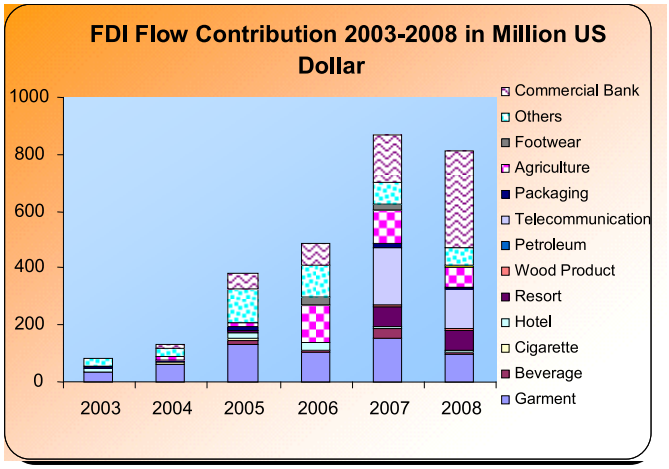


Figure 17
FDI Flow Contribution 2003-2008
(US$ million)

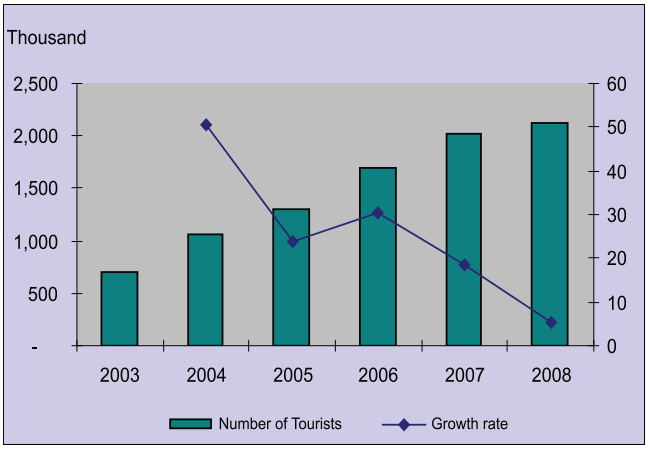


Source: BOP of Economic Research & Statistics Department

4.5 Tourism

The number of tourists fluctuated, increasing from during the period 2003 to 2008 reaching a peak at an annual of 51% in 2004, and with the rate subsequently slowing down from 2005 to 2008. The capital city of Phnom Penh and Siem Reap Province are the most attractive sights for tourists. The number of tourist arrivals reached more than 2 million in 2008, as compared to about 700,000 in 2003.

Figure 18
Tourism and Its Growth Rate

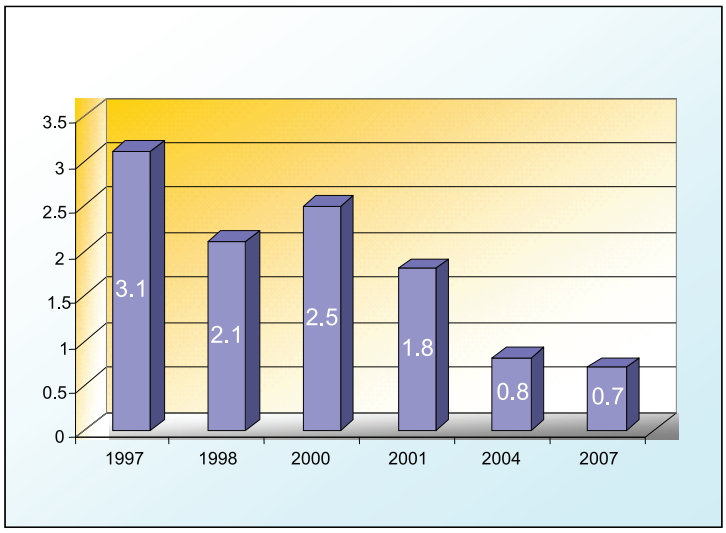


Source: BOP Division of Economic Research & Statistics Department of NBC

4.6 Unemployment Rate

The rate of unemployment decreased over the years with the exception in year 2000. The rate peaked at 3.1% in 1997, fluctuated in 1998 and 2000, and declined to 0.7% in 2007. The decline in the unemployment rate was reflected by the rise of foreign direct investment due to to government policy.

Figure 19
Unemployment Rate

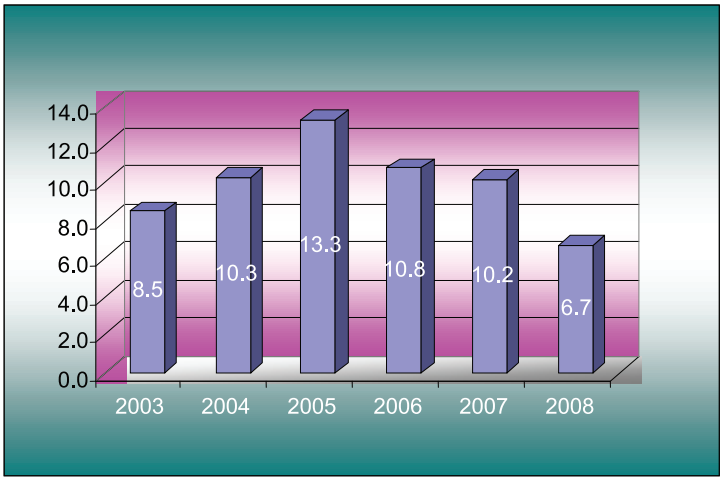


Source: Financial Year Book 2008

4.7 GDP Growth

The real GDP growth rate accelerated from 8.5% in 2003 to reach the peak at 13.3% in 2005. It then slowed down to reach 6.7% in 2008. However, regardless of the inflation rate during the period under consideration, the estimated growth rate reached the peak at 24%, in 2007, while the growth rates of the service sector; agriculture, fisheries and forestry sector; and industry sector were 16.8%, 16% and 11.8%, respectively.

Figure 20
GDP Growth Rate



Source: Economic Research & Statistics Department of NBC

5. Banking System in Cambodia

Under a dollarised economy, Cambodia adopted a two-tiered banking system, consisting of the National Bank of Cambodia (NBC), the central bank, at Tier 1 and the commercial banks and financial institutions at Tier 2. As of December 2008, the banking system in Cambodia comprised the NBC, 24 commercial banks, 2 foreign banks representative offices, 6 specialised banks, 18 licensed microfinance institutions and 25 registered microfinance operators which are under the regulatory and supervisory authority of the NBC.

Intermediation in banking sector grew during the period of 2003-2008. Despite the looming crisis in 2008, intermediation in the banking sector grew at a promising rate during the first half of the year. However, the impact of the global crisis caused a downturn in the second half of 2008. The combined effect in 2008 netted off to a slight improvement from 2007.

Listed in Figure 21 below, almost all of the total deposits are denominated in foreign currency, indicating that the degree of dollarisation in Cambodia.

Figure 21
Types of Deposits

	2003	2004	2005	2006	2007	2008
Demand deposits	29.2	38.1	40.6	58.1	62.3	104.8
Quasi-money	2391.5	3176.4	3702.1	5284.6	9258.7	9459.3
Time deposits	81.9	97.3	112.7	88.6	121.0	184.8
Foreign currency deposits	2309.6	3079.1	3589.4	5196.0	9137.7	9274.5
Total Deposits	2420.7	3214.5	3742.8	5342.7	9320.9	9564.1
Foreign currency deposits to total Deposits	0.95	0.96	0.96	0.97	0.98	0.97

Source: Monetary Survey of NBC

The current banking system of Cambodia is quite satisfactory. Public confidence in the banking and financial system is reflected in the increase in the deposit, credit and total assets of the banking sector to GDP.

Figure 22
Assets of Banking System

Category/ Year	2000	2008
Deposit (%)	14.27	23.9
Credit (%)	6.97	21.4
Total Assets (%)	21	30.6
Capital (%)	5.62	8.89

Source: Monetary Survey of NBC

Figure 23
Credit Growth

	2003	2004	2005	2006	2007	2008
Private sector credit growth rate (%)	26.2	35.9	**31.8**	51.6	76.0	55.0

Source: Monetary Survey of NBC

The loan growth fluctuated from 26.6% in 2003 to 55% 2008, reaching the peak at 76% in 2007. The highest point of the loan growth resulted from the economic boom and buoyed by improved public confidence in the banking sector. The loan growth had been rather high during the period under consideration, reflecting that the stock data of annual loans is still small compared to other countries. Loans for personal consumption make up about 10% of the total loans and are just less than 3% of the gross domestic product.

6. Conclusion

To sum up, the data during 2005-2008 indicated increasing household indebtedness represented by a rise in loan to personal consumption. Some macroeconomic data also support the increase in loan to personal consumption; nominal interest rates appeared to be quite stable during the period under consideration, with slowdown in the rate of unemployment and corresponding increase in the inflation rate, which point to the increase in consumption. In addition to this, intermediation in the banking sector will be the vehicle facilitating the growth of banking and financial institutional credit, including the extension of loans to personal consumption.

However, household debt was small relative to the gross domestic product during 2005-2008, reaching a peak at 2.5% in 2008. While it is insignificant in relation to the gross domestic product, the trend of household debt reflected a jump from 2005 to 2008. It may signal a warning that household indebtedness may increase sharply in the future.

Foreign direct investment inflows also rose during the period under consideration which have boosted the growth of the gross domestic product and stimulated consumption raising the demand for loans.

Since NBC have not issued any announcement or implemented any prudential measures concerning household indebtedness, this research paper cautions that prudential measure are to be laid down to react to rapid increase in household indebtedness since it may harm financial stability.

Because of the fact that there has not been much financial innovation in Cambodia, the government should take care of this issue once there is financial development.

CHAPTER 3

HOUSEHOLD INDEBTEDNESS AND ITS IMPLICATIONS FOR FINANCIAL STABILITY IN MALAYSIA

By

Nazreen Abdul Ghani[1]

1. Introduction

The aggregate Malaysian household sector exhibited sustained financial capacity and adaptability in adjusting to greater employment pressures under the challenging economic environment in 2008-09. This was also supported by a healthy balance sheet as well as stable indebtedness and income levels.

Following the Asian Financial Crisis in 1997-98, banking institutions in Malaysia had diversified their intermediation focus. This resulted in portfolio shifts from being highly-concentrated in corporate sector financing towards greater retail financing to households and, small and medium enterprises (SMEs). This was accompanied by a strengthened financial infrastructure with the establishment of the Central Credit Reference Information System (CCRIS), an online system of borrower credit information in 2001. The greater emphasis on retail financing was also supported by a strengthened risk management infrastructure and capability at the institutional front.

As at end-2008, total financing to the household sector accounted for 54% of outstanding financing extended by the banking system[2], a marked increase from 28.4% as at end 1996. With the increased significance of banks' exposures to the household sector, concerted efforts were undertaken over the years to progressively enhance the assessment of household sector in Malaysia, particularly in identifying potential stress in different segments of the population. This was necessary given the significant direct and indirect spillover effects of problems

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1. The author is a Senior Executive in the Financial Surveillance Department in BNM. The author wishes to express her gratitude to Dr. Don Nakornthab, Madelena Mohamed, Dr Zarina Zainal Abidin, Dr Hamim Syahrum Ahmad Mokhtar, Lau Chin Ching, Siti Hanifah Borhan Nordin, Raymond Yeo, Shaza Marina Azmi and Lim Le Sze for their comments. The views expressed here are solely those of the author and do not necessarily reflect the views of the Central Bank of Malaysia (Bank Negara Malaysia, BNM).

2. Banking system consists of commercial, investment and Islamic banks.

associated with excessive indebtedness to economic and financial system stability as well as social implications. The approach to surveillance has been forward looking in nature with emphasis on stress testing and scenario-based, to enable pre-emptive policy responses if and where necessary. Efforts to enhance household data collection at a granular level remain a priority to facilitate in-depth understanding of the issues and any potential concerns on a particular income group.

Several key Financial Soundness Indicators (FSIs)[3] for the household sector as recommended by the International Monetary Fund (IMF) are published annually in the Financial Stability and Payment Systems Report (FSPSR) of BNM as shown in Table 1. The level of household non-performing loans (NPLs) continued to trend downwards until September 2008.

Table 1
Financial Soundness Indicators for Households 2003-08

Household (HH) Sector	As at end					
	2003	2004	2005	2006	2007	2008
	Percent					
HH Financial Assets to Total HH Debt[4] Ratio	253.9	250.0	237.3	247.2	269.8	234.6
HH Debt to Gross Domestic Product Ratio	66.1	66.7	69.1	68.8	66.9	63.9
HH Liquid Financial Assets[5] to Total HH Debt Ratio	153.1	152.4	142.8	151.5	172.3	138.5
Debt Repayment Ratio[6]	44.7	38.4	41.3	39.1	41.2	39.6
NPL Ratio of Household Sector	10.4	8.5	8.1	7.1	5.3	4.1

Source: Annual Report and Financial Stability and Payment Systems Report, Bank Negara Malaysia, various issues

3. Based on the IMF Financial Soundness Indicators: Compilation Guide. See list of references in the appendix.

4. Household debt consists of borrowings made by individuals from the banking system, development financial institutions, government (public sector employees only) and insurance companies.

5. Household Liquid Financial Assets consist of deposits in the banking system and development financial institutions, and the market value of unit trust funds and equity holdings.

6. Debt repayment ratio consists of outstanding loan payments of principal and interest to personal disposable income

2. Literature Review of Household Debt Studies in Malaysia[7]

A few studies relating to household debts in Malaysia were conducted in 2006 in accordance to the increasing exposures of the banking system to the sector during the period. The studies generally focused on the residential market in Malaysia, given that bulk of household debts are for house financing (approximately 50% of total household debts), and the strong inter-linkages between the housing property market and real economic growth. One of the studies also discussed the prevailing developments in household financing in Malaysia and the implications for monetary policy and financial stability.

3. Facts About Household Debt in Malaysia

3.1 Aggregate Trends (Time Series)

Figure 1
HH Indebtedness and Debt Repayment Ratio

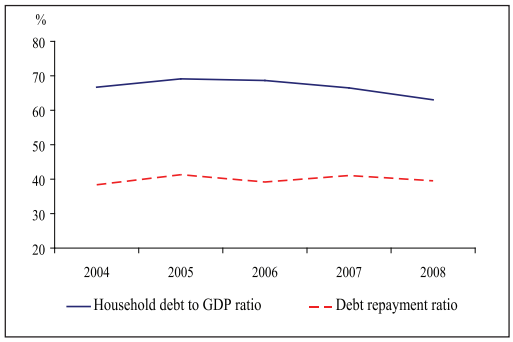
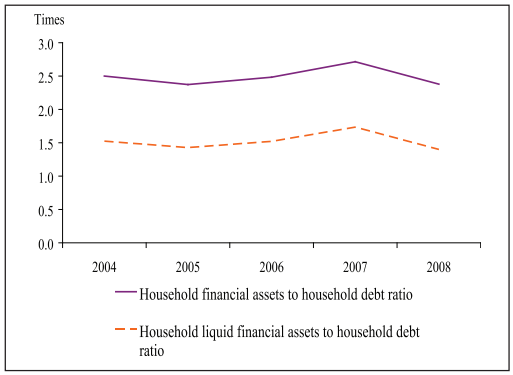


Figure 2
HH Financial Assets to HH Debt Ratio



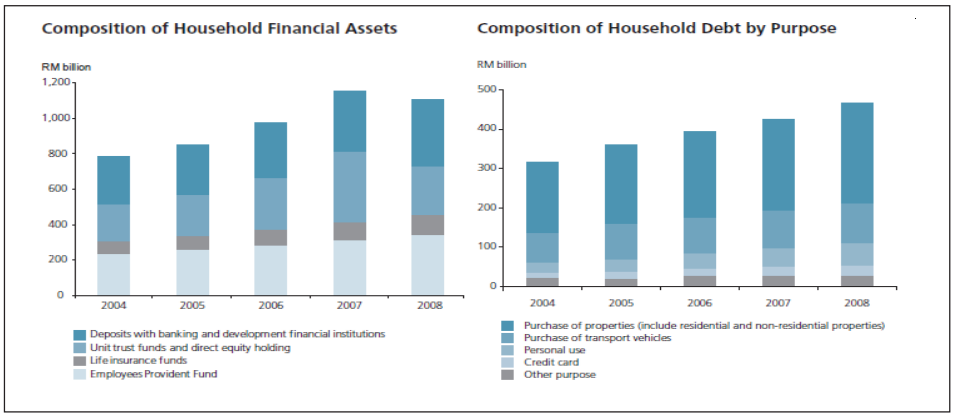
Source: Bank Negara Malaysia, Treasury Housing Loans Division, Employees Provident Fund and Securities Commission Malaysia

7. Please refer to the Appendix for list of references used.

The aggregate household debt-to-gross domestic product (GDP) ratio in Malaysia has been relatively stable at around 64% - 69% throughout 2004 to 2008 (See Figure 1). During this period, household debts grew rather strongly at an annual growth rate of 17.1%. This was supported by growth in income levels, largely in tandem with the favourable economic conditions. The growing affluence of the Malaysian population in an environment of greater focus by banks on retail business was also another driving factor contributing to the growth in indebtedness. The continued improvement in income level has partly contributed to the improvement in the ratio of loan repayments-to-disposable income. The debt servicing capacity is further boosted by a strong level in financial buffers. The financial assets-to-debts ratio has remained high at 2.3 times as at end-2008 (See Figure 2). The strong initial position more than offset the small decline of 4.1% in household financial assets during the year as the value of investments in equity and unit trust funds declined following greater market volatility.

Household financial assets in Malaysia comprise deposits with banking institutions, development financial institutions, unit trusts, equity holdings, life insurance funds and employee provident fund. Taking into account only the deposits and equity/unit trust portfolios, the level of liquid assets remained ample at 138.5% of household debts. The increase in disposable income in recent years has enabled households to accumulate savings as reflected in the average annual increase of 9% in households' deposits with banking and development financial institutions over the last five years.

Figure 3
Composition of HH Financial Assets and HH Debt by Purpose



Source: Employee Provident Fund, Securities Commission Malaysia and internal estimates

Source: Treasury Housing Loans Division, Bank Negara Malaysia

Meanwhile, the bulk of household debts are mainly for asset acquisition, with housing loan and motor vehicle financing accounting for over 75% of household loans as at end-2008 (See Figure 3).

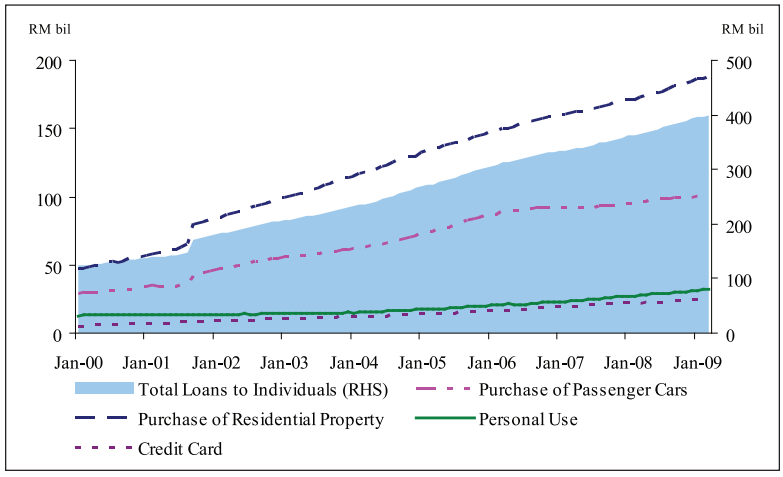
3.2 Sources of Household Debt

The primary source of borrowings for households is the commercial banks, Islamic banks and development financial institutions. Other institutions providing lending facility to households include several non-banking institutions, such as credit companies, building society, credit cooperatives, and insurance companies.

Information on the household sector in Malaysia is available at the aggregate level and compiled through statistical submissions and publications by banking institutions, selected development financial institutions, insurance companies, takaful operators and the Government Housing Loan Division. In addition, information sources like the credit bureau (Central Credit Reference and Information System) – detailed aggregate financing data, the Ministry of Human Resources – labour market indicators, and the Department of Statistics of Malaysia – Population and Housing Census (once in every decade), Household Income Survey (biennial) and the Survey on Household Expenditure (once in five years) are also used.

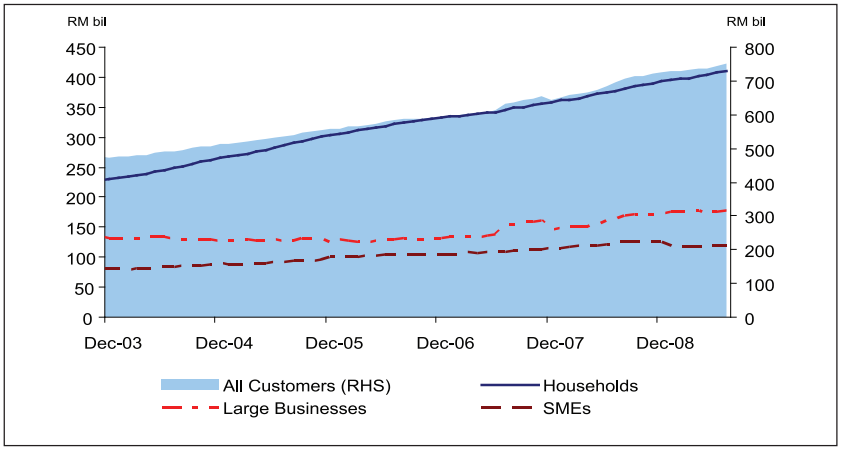
3.3 Financial Institution (Supply-Side) Perspectives

Figure 4
Banking System Outstanding Household Loans by Key Purposes



Source: Bank Negara Malaysia

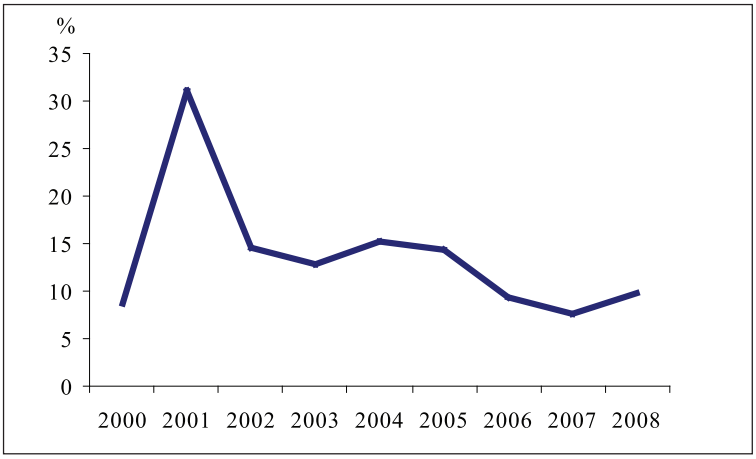
Figure 5
Banking System's Outstanding Loans by Customer



Source: Bank Negara Malaysia

Outstanding loans to household have been trending upwards since 2000 as shown in Figure 4. The upward trend is contributed by banking institutions diversifying their financing portfolios from being highly-concentrated in financing to the corporate sector towards greater retail financing to households (See Figure 5). In addition, banks have been actively introducing various financing packages to expand market share. The favourable conditions in the economy has also spurred numerous residential developments, thus increasing the availability and choices of residential properties and hence demand for housing loans.

Figure 6
Annual Growth of Household Loans



The steep decline in growth of household loans as seen in Figure 6 was due to high base effect. In 2001, demand for household loans flourished due to the low interest rate environment with financial institutions offering competitive housing loan packages with lower margin requirements and longer tenure. Other incentives included withdrawals of EPF funds for the purchase of a second house provided the first house has been sold; exemption from stamp duties; lifting limitations for financial institutions to finance the construction of residential properties priced above RM250,000 each and shop houses within residential areas; and allowing proceeds from private debt securities to be used to finance the development of such properties.

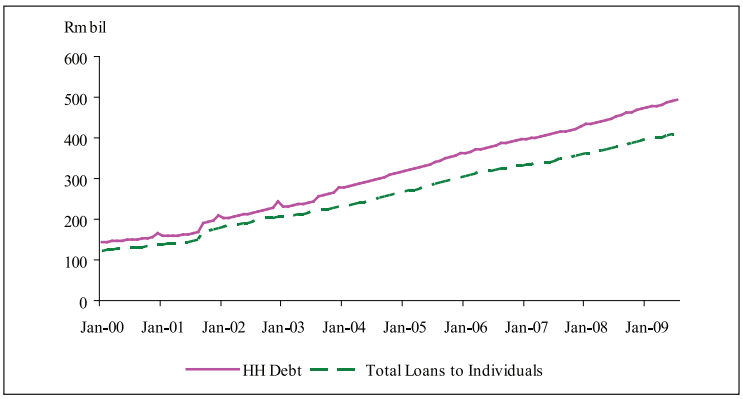
4. Forces Behind the Rise of Household Indebtedness in Malaysia

To create a better understanding of household indebtedness and its possible implications on banks' loan losses, we first review several possible explanatory variables. These variables are then run on an econometric model to identify significant variables contributing to household NPL levels and whether the model estimate conforms to our expectations based on the review of these variables. The variables used were based on previous literature including Ng (2006), Endut & Toh (2009) and Debelle (2004).[8]

Household indebtedness in Malaysia, measured by the ratio of household debt-to-GDP averaged 66% between January 2000 and July 2009. Meanwhile, total household loans increased gradually as depicted in Figure 7, and accounted for 54.6% of total banking system loans as at July 2009. Household indebtedness is believed to have a positive relationship with household delinquencies level as higher indebtedness increases the chance of default. Thus, we set the household indebtedness to affect household NPLs with 1 quarter lag.

8. Please refer to the Appendix for list of references used.

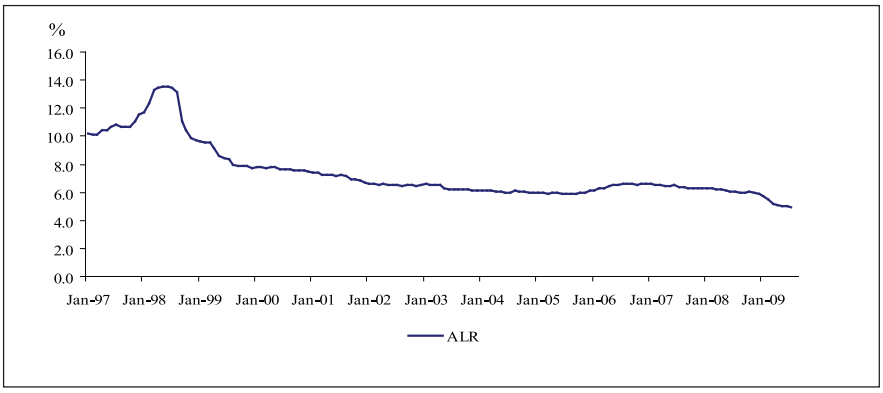
Figure 7
Banking System Loans to Individuals



Source: Bank Negara Malaysia

After the Asian Financial Crisis, the average lending rate remained steady at around 6% (See Figure 8). Lending rates, or costs of borrowing, are expected to be the main force of household indebtedness as households are expected to borrow more when the cost of borrowing is lower. As lending rates start to rise, this trend may induce greater caution on households to incur additional or new debts and vice-versa. Higher rates may also cause existing borrowers to face difficulties to repay their debt, subsequently causing delinquencies. Furthermore, about 60% of banking system household loans is based on floating rates. Therefore, interest rates are expected to positively affect household NPLs. For this research, we use the average lending rate of Malaysian's banking system to represent the interest rate affecting household debt.

Figure 8
Average Lending Rates (ALR) of Malaysia's Banking System

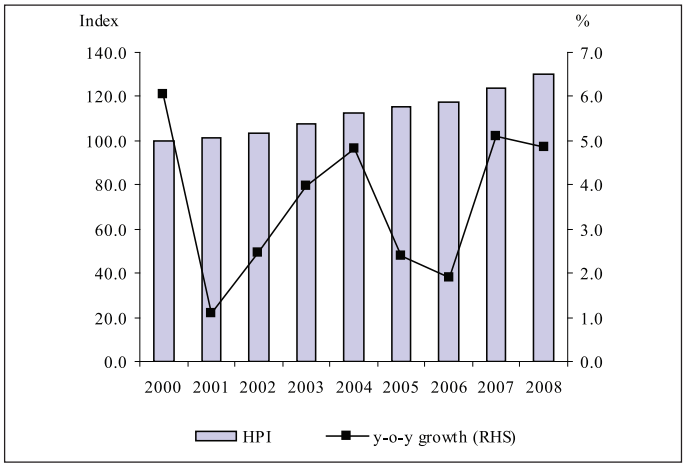


Source: Monthly Statistical Bulletin (MSB) July 2009, Bank Negara Malaysia

Considering that housing loans account for about half of total household loans, house price movements are expected to be a significant force of household indebtedness. Changes in house price have direct effects on household wealth. House owners often experience a growth in their wealth from increasing house prices. In Malaysia, the increase in wealth is only experienced by the individual upon reselling the house at a higher value. In addition, house owners may also benefit from the higher market prices by refinancing the loans. For prospective owners, a higher house price may either bring forward house purchase or cause households to defer on their purchases. House prices in Malaysia have grown between 1-6% since the year 2000 as shown in Figure 9.

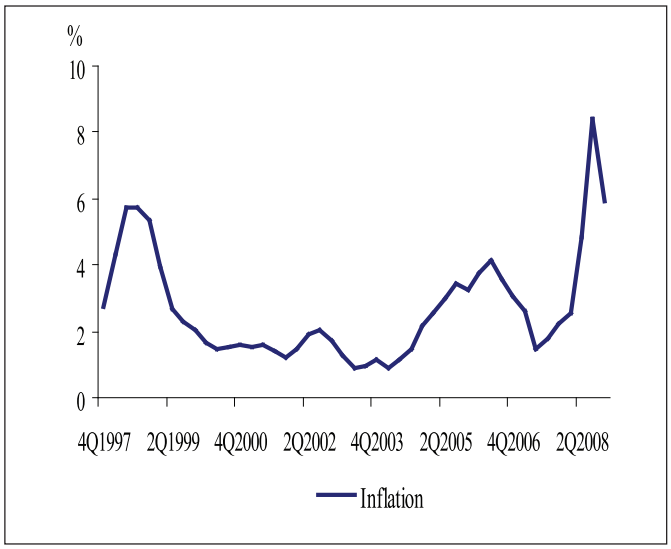
Inflation affects household indebtedness similar to house prices. Lower inflation means a reduced cost of borrowing, and this increases the incentives to borrow in order to smooth their desired path of consumption over the life cycle (Endut & Toh, 2009). Between 1997 and 2009, inflation in Malaysia has averaged about 2.7% (See Figure 10).

Figure 9
House Price Index (HPI)



Source: National Property Information Centre (NAPIC)

Figure 10
Inflation (y-o-y)

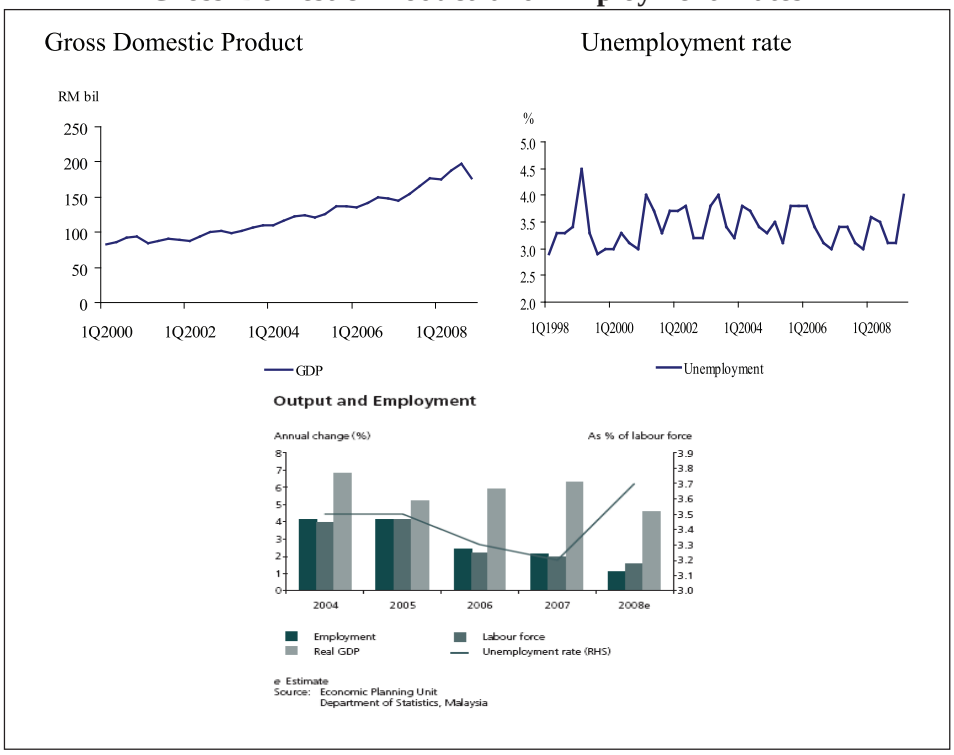


Source: CEIC

Employment affects households' ability to repay loans. A household experiencing loss of part or entire income, with insufficient buffers, would experience great difficulty in repayment leading them to default on their loans. Another scenario is that people entering employment may start taking up debt, assuming that they are able to service their loan in the long term by having a stable job and continuous income. This is especially true for new entrants to the workforce. Higher household income and boosted consumer confidence induce optimistic expectations of future income (Endut & Toh, 2009). Malaysia's employment rate has remained stable between 3 – 4% post-Asian Financial Crisis as shown in Figure 11.

A household's willingness and need to borrow rely heavily on income. Higher income also increases the capacity to service existing debts. For this paper, we use the GDP of Malaysia as a proxy to household income due to unavailability of data. When GDP rises, NPL levels are expected to reduce, signifying a negative relationship. Malaysia's GDP has been trending upwards whilst the unemployment rate shows some seasonality albeit stable between 1998 and 2008 (See Figure 11).

Figure 11
Gross Domestic Product and Employment Rates

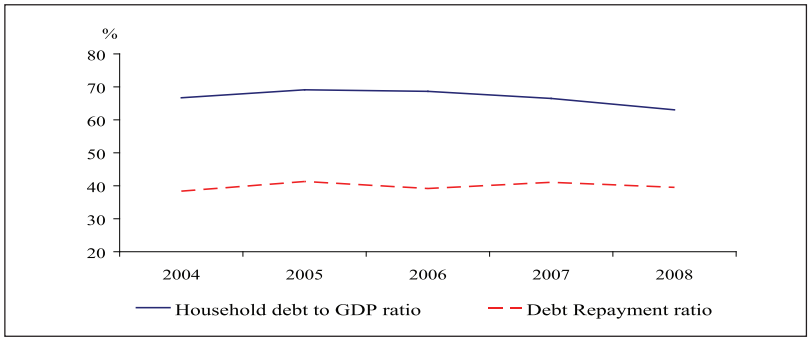


Source: Department of Statistics, Malaysia, Bank Negara Malaysia, Economic Planning Unit

5. Assessment of Household Debt Vulnerability

5.1 Aggregate Debt Repayment Ratio

Figure 12
Household Indebtedness and Debt Repayment Ratio



Source: Bank Negara Malaysia

The debt service ratio is commonly used by banks to assess applicants' ability to repay by setting a threshold based on income level for the level of debt to be granted. For example, a 60% threshold will disallow individuals to be more than 60% indebted out of their personal disposable income. However, data on the total current obligations is unavailable; therefore debt repayment ratio is used to assess the repayment behaviours of households.

The debt repayment ratio equals to the total amount of loan repayments (principal and interest) by individuals to personal disposable income. The debt repayment ratio may not accurately capture the exact servicing capacity of households, as some individuals could either overpay or underpay their monthly obligation. However, it still serves as a useful indicator in the place of the debt service ratio at the aggregate level.

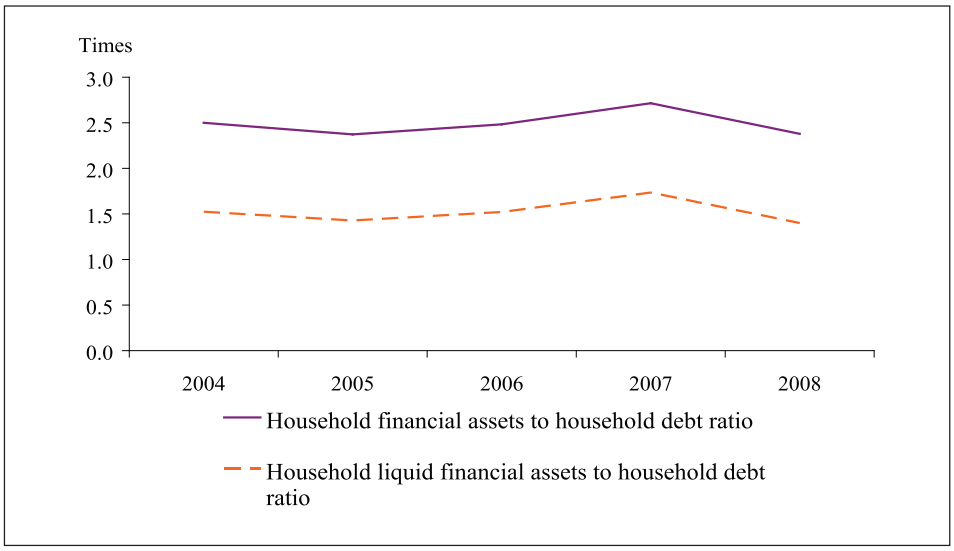
Between 2004 and 2008, the debt repayment ratio has continued to stabilise around 40% as shown in Figure 12. This may indicate that the household indebtedness to personal disposable income is relatively low, thus providing more capacity to borrow.

Meanwhile, a higher debt service ratio may translate into having a bigger debt obligation as a proportion of one's income. Households' personal disposable income is used for living needs, and unless they have accumulated savings or sufficient liquid financial assets, any increase in a household's debt service ratio may increase the likelihood of a default in loans. Therefore, the debt service ratio is expected to have a positive relationship with household NPLs.

However, given that we use the debt repayment ratio in the place of the debt service ratio, the debt repayment ratio is expected to have an opposite effect on household NPLs. This is mainly because debt repayment is based on historical data, where households have serviced their debt in a proportion such that the remainder of their disposable income is sufficient to cater for their living expenses. Therefore, a higher debt repayment ratio may signify households being able to service their debt at a higher proportion of their income, subsequently lowering the chances of household delinquency occurring. Thus, the debt repayment ratio is expected to have a negative effect on household NPLs.

5.2 Aggregate Asset-to-debt Ratio

Figure 13
Household Financial Assets to Household Debt Ratio



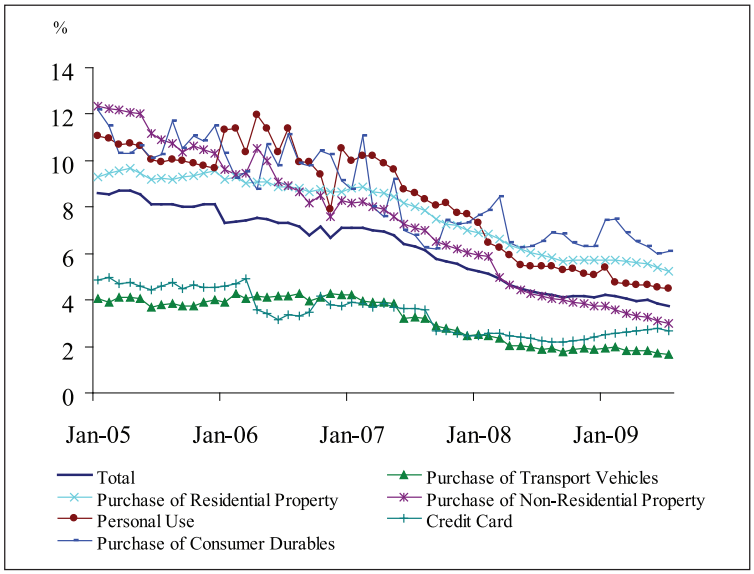
Source: Bank Negara Malaysia, Treasury Housing Loans Division, Employees Provident Fund, Securities Commission Malaysia and internal estimates

Household financial assets to debt have been stable since 2004, amounting up to 2.3 times as at end 2008. Figure 13 shows the household liquid financial assets at around 1.4 times, providing ample liquidity to service sudden short term obligations.

5.3 NPL Rates of Different Types of Consumer Loans of Commercial Banks

Household NPL ratios for households had shown a downward trend with household NPL ratio at 3.75% as at end-July 2009 (See Figure 14). This is in line with improvements in risk management practices by the banks despite the rapid growth in household loans.

Figure 14
NPL Ratio of Household Sector in the Banking System by Purpose



Source: Bank Negara Malaysia

The soundness and stability of households are commonly assessed by household non-performing loans to total household loans financial position (HH NPL Ratio). Increasing HH NPL levels may result in lenders holding back on credit to household, subsequently resulting in implications to financial stability. We then attempt to understand the possible variables that influence household NPL levels by using household NPL levels as the dependant variable in an econometric model.

5.4 Model of Banking System's Household Loan NPL Levels Using Aggregate Data

The data that is available is presented in three different time intervals: monthly, quarterly and yearly. The monthly and yearly data was converted into quarterly data through averaging. The model was estimated using quarterly data from 2000 Q1 to 2009 Q2. Since the model is limited to a size of 35 observations, the appropriate methodology to be used would be the Ordinary Least Squares (OLS) method.

Initially a model incorporating all the variables mentioned in Section 4 of this paper and debt repayment ratio was constructed using the econometric

analysis software of *Eviews 6.* However, due to lack of goodness of fit where the residuals did not conform to the normality assumptions, several combinations of variables were tested and dropped and the resultant model is as follows:

$$log(Household\ NPL)_t = \beta_0 + \beta_1 (household\ indebtedness)_{t-1} + \beta_2 log(interest\ rate)_t + \beta_3 (debt\ repayment\ ratio)_t + \beta_4 log(inflation)_t + \beta_5 log(income)_t$$

$$log(Household\ NPL)_t = 12.7717 + 2.2698\ (household\ indebtedness)_{t-1} + 0.3772\ log(average\ lending\ rate)_t - 1.6706\ (debt\ repayment\ ratio)_t - 0.0608\ log(inflation)_t - 0.3825\ log(gross\ domestic\ product)_t$$

Table 2
Ordinary Least Squares of Household NPL with 95% Confidence Level

Dependent Variable: LOG(Household NPLs)
Method: Least Squares
Sample (adjusted): 2000Q2 2008Q4
Included observations: 35 after adjustments

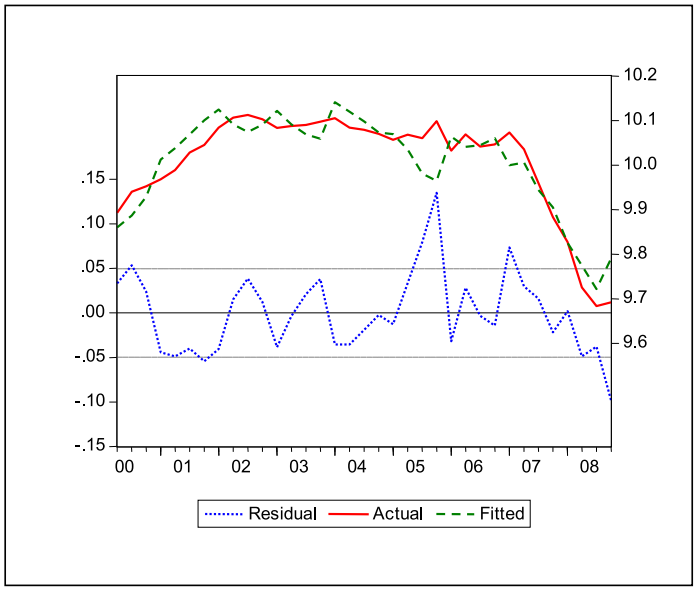
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.77169	0.996412	12.81767	0.0000
Household Indebtedness(-1)	2.269797	0.284289	7.984119	0.0000*
LOG(Average Lending Rate)	0.377247	0.212320	1.776788	0.0861
Debt Repayment Ratio	-1.670634	0.355001	-4.705998	0.0001*
LOG(Inflation)	-0.060769	0.023499	-2.585982	0.0150*
LOG(Gross Domestic Product)	-0.382487	0.060101	-6.364033	0.0000*

R-squared	0.849904	Mean dependent var	10.00812
Adjusted R-squared	0.824026	S.D. dependent var	0.118312
S.E. of regression	0.049631	Akaike info criterion	-3.013597
Sum squared resid	0.071434	Schwarz criterion	-2.746966
Log likelihood	58.73795	Hannan-Quinn criter.	-2.921556
F-statistic	32.84199	Durbin-Watson stat	1.109795
Prob(F-statistic)	0.000000		

*denotes significant independent variables

The model estimate shows a good fit and has a significant p-value and adjusted R^2 of 0.82. Using Breusch-Godfrey Serial Correlation LM Test, the independent variables were tested and found to have no correlation with the residuals at the 95% confidence level.

Figure 15
Graph of Actual, Fitted and Residuals



The empirical model confirms several assumptions made in the review. The model shows a positive relationship between the level of household NPLs with household indebtedness and interest rates. As households become more indebted, there is a higher possibility for household loans to turn non-performing.

Higher interest rates may also increase the likelihood of delinquencies as higher interest rates result in higher obligations in servicing debt for households. Whilst the model estimates that interest rate is not a significant independent variable for household NPLs, the variable was kept in the model as it has sufficient explanatory powers given that about 60% of household loans are based on floating interest rates. Thus, the loan service obligations are directly affected by interest rate movements which may subsequently affect household NPLs.

On the other hand, the debt repayment ratio, inflation and gross domestic product negatively affect household NPL level. The opposite effect of GDP and household NPL signifies that the nation's growth helps to keep household NPL at moderate levels. This also conforms to our hypothesis where increase in income or GDP lowers NPL levels.

The opposite effect of inflation suggests that inflation increases household wealth, therefore positively affecting their capability to service their debt. Lastly, the negative relationship between the debt repayment ratio and household NPLs depicts that an increase in the debt repayment ratio results in a decrease in HH NPLs as expected. The significance of the debt repayment ratio shows that the ratio is a very useful indicator to assess the debt servicing capability of households.

6. Implications to Financial Stability

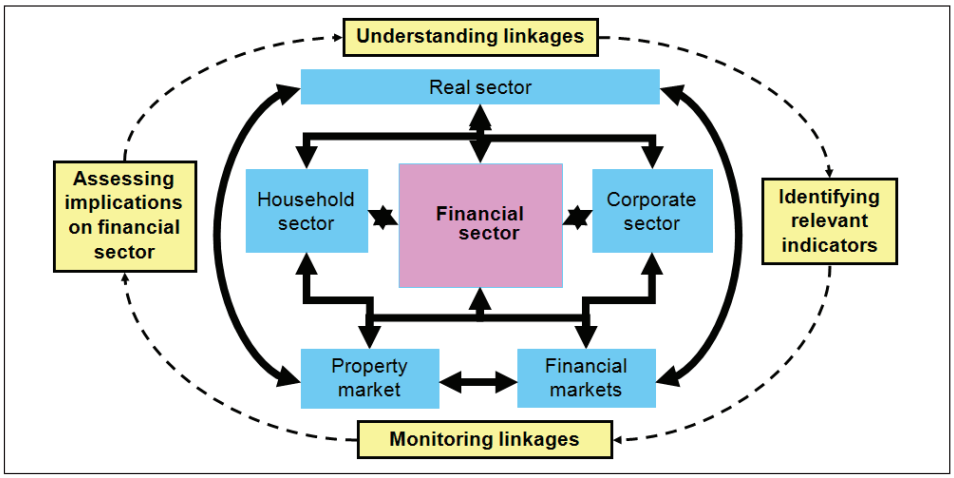
Household lending has significantly grown over the decade, and constitutes at least half of bank loans as at July 2009. The growing trend raises the concern on whether the quality of the household debt is sustainable. With household assets generally growing as well, the household sector is becoming more sensitive to macroeconomic indicators such as interest rates, income and inflation. This exposure creates vulnerability to the household sector as a whole, possibly causing implications on other sectors within the financial system.

In the event of an unfavourable occurrence, the following depicts an example of the linkages of the household sector to financial stability concerns - a significant increase in household NPL levels could lead to financial instability. High levels of household NPLs would drain up provisions and buffers set by financial institutions, depleting their capital. In return, banks become unwilling to provide financing, leading to credit constraint on the household sector and even other economic sectors as capital is eroded. The financial institutions' role in financial intermediation will be compromised as a result. The effects may then spillover into the property sector as home owners and/or lender begin to flood the market with properties for sale. As financial institutions become more reluctant to lend to households, the demand for properties and automotives may also be reduced.

With decreased access to financing, households may draw out savings and deposits for consumption of goods and services, creating a need for banks to have the agility to rebalance their funding and liquidity strategies.

With the household sector's high significance in the financial system, vigilant monitoring, assessment of the sector and thorough understanding of linkages is extremely important to preserve financial stability. The interlinkages of the household sector can be described in Figure 16.

Figure 16
Interlinkages in the Financial Sector



Source: Bank Negara Malaysia

This paper examines the variables that could significantly affect household NPLs, as household NPL levels are one of the key indicators in determining the sustainability of household indebtedness. By identifying potential variables and assessing their implication on household NPLs, these variables may serve as indications or early warnings on changes in NPL levels. We then ascertained that household indebtedness, interest rates, debt repayment ratio, inflation and GDP are the important variables to consider. The trends of these variables remain relatively stable whilst the HH NPL ratio trended downward. Thus, household indebtedness does not pose a concern to financial stability at this point in time.

7. Policy Implications

Bank Negara Malaysia has implemented measures to manage the potential risks arising from household indebtedness. These measures are aimed at facilitating the assessment of individual's credit standing and to promote financial literacy.

The Central Credit Reference Information System (CCRIS) became operational in October 2001. The CCRIS is a database that stores all credit information and history of a borrower. Financial institutions are able to look up a potential borrower's current credit status and history, and assess their capability to repay their loans. With CCRIS, lenders are able to practice better risk assessment of borrowers.

Informative channels such as *BankingInfo* and *InsuranceInfo* were established to enhance financial education and literacy. These information portals also facilitate decision making by households. Households are able to seek financial advice through BNMLINK and TELELINK. Ongoing school programmes like *DuitSaku* aim to nurture financial understanding from a young age.

In 2006, BNM established the Credit Counselling and Debt Management Agency (CCDMA) to provide counseling and advice to individuals on issues related to financial management, debt management and financial education. The existence of CCDMA continues to equip the public with financial know-how and its results are seen with the better management of personal finance that continues to keep NPL rates low. Since its inception, there has been growing awareness among the banking public of the importance of maintaining financial discipline to avoid being overly indebted as well as the banks' readiness to restructure loans. Given the experiences and the relationships built with financial institutions since its establishment, the CCDMA is well-positioned to handle increased demand for debt counselling and restructuring should the economic environment face greater challenges.

There is a dedicated division in BNM that is accountable for financial stability mandate, with functions distributed across several departments. In 2006, a transformation exercise was undertaken to facilitate a more integrated, holistic and harmonised approach to regulation and supervision and thereby further strengthen the conduct of financial stability within BNM. This transformation exercise has now yielded positive results. The macroprudential orientation and conduct of surveillance was further enhanced with the setting up of the Financial Surveillance Department in late 2006. The Department is entrusted to undertake comprehensive and integrated identification of vulnerabilities and the calibration of assessment methodologies via collaborative mechanisms within BNM and with domestic regulators to facilitate robust assessment of the risks emanating from domestic and international developments on the overall stability and functioning of the financial system. As part of its overall surveillance framework, the Department also works closely with the supervisors to ensure that risk assessment incorporates and integrates both macroprudential and microprudential perspectives.

Efforts to enhance data collection at a more granular level on the household financial position are currently underway, in collaboration with other relevant authorities to obtain information by income levels and social segments. Financial

institutions' risk management practices and tools are reviewed and developed for improvement in assessing credit risk and adapting to changing environments.

8. Conclusions

The rising trend of household indebtedness has prompted more studies and more rigorous assessments of the household sector. The increasing lending to household depicts a growing economy with ample circulation of funds. A robust economy, coupled with high savings of households, have enabled households to accumulate more debts. In addition, household lending is generally seen as low risk as borrowers are fragmented, and their loan amount is considerably smaller as compared to business loans. Therefore, it would require a very adverse slowdown in the economy to result in major losses on the households' portfolio of the financial institutions.

Statistically, the rise may be explained by the trends in household debt-to-GDP, interest rates, debt repayment ratio, inflation and income. This study has helped to identify and assess several variables that influence household NPLs. The identification of these variables also enhanced understanding of the interlinkages between economic data with financial indicators.

Efforts to enhance household data collection at a granular level remain a priority to facilitate an in-depth understanding of the issues and any potential concerns on a particular income group. Micro data enables analysis on the structure and assessment of the mismatch between assets and liabilities of households. Besides that, identification of the proportion of individuals with over-accumulation of wealth, its risks and possible consequences to the economy can be assessed. Valuable insights about how institutions and policies affect the transmission of shocks and the distribution of risks can be better understood. Reliable data on households' wealth, income and consumption can provide important input into central banks' policies, ranging from monetary policy to financial stability and payment systems policy. Meanwhile, BNM is continuously enhancing its assessments of the debt servicing capacity of the household sector in order to identify any emerging risks to financial stability.

As the household sector continues to be increasingly important to the financial sector, vigilant monitoring and proper assessments are vital. By ensuring adequate risk management systems such as credit scoring, the banks are able to manage risks in a changing economic landscape, thus ensuring a resilient financial system.

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Appendix

Explanation and Definitions of Data and Ratios

Disposable income	(Personal) disposable income derived from nominal GDP, net of corporate and government incomes, as well as personal income tax and compulsory savings by the Employee Provident Fund.
Debt repayment ratio	Total loan repayments by individuals to personal disposable income. Repayments consist of both principal and interest portions.
HH Financial Assets	Consists of deposits with banking and development financial institutions, the market value of unit trust funds and equity holdings, the savings portion of life insurance funds (eg. endowment) and savings with the Employees Provident Fund.
HH Liquid Financial Assets	Consists of deposits with banking and development financial institutions, the market value of unit trust funds and equity holdings.
HH Debt	Total outstanding household/ loans taken from the banking system, development financial institutions, the government under the treasury housing loans scheme for public sector employees and insurance companies.
HH Loans	Total outstanding household loans taken from the banking system.
HH Non-performing loans ratio (HH NPL ratio)	Total household non-performing loans to total outstanding household loans.

CHAPTER 4

IMPLICATIONS ON FINANCIAL STABILITY OF HOUSEHOLD CREDIT ACCUMULATION IN THE PHILIPPINES

By

Diwata Miguela E. Samarita[1]

1. Introduction

1.1 Overview

Over the years, the Philippine banking system's loan exposure to the household sector has generally been increasing (Figure 1).[2] The banking system's loan exposure to the household sector as a share of the total loans increased from 17.8% in 2000 to 24.9% in 2007 but dropped to 18.3% in 2008, in part, due to the credit tightening during the global financial crisis. Reflecting this generally upward trend, the combined residential real estate and credit card loans as a share of total loans increased from 6.2% in 2001 to 10.6% in 2008. Moreover, despite the drop in the growth rate of total household loans in 2008, residential real estate and credit card loans continued to grow during the year.

Figure 1.A
Household Loans to Total Loan Exposure of the Banking System (in percent)

	Total Household Loans [3]	Credit Card Loans	Residential Real Estate Loans	Automobile Loans	Other Household Loans
2000	17.8	n.a.	2.8	n.a	n.a.
2001	18.7	3.0	3.2	2.1	10.4
2002	20.4	3.3	3.4	2.6	11.2
2003	20.5	3.5	3.6	2.8	10.7
2004	22.8	3.9	4.0	2.8	12.1
2005	24.4	4.6	4.6	3.4	11.8
2006	24.1	5.0	5.1	3.6	10.4
2007	24.9	5.2	5.1	3.9	10.7
2008	18.3	4.9	5.7	2.9	4.8

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2. Using the National Income Accounts (NIA) definition, the household sector covers resident households and all unincorporated business units, single proprietorship, partnership, cooperatives, and non-profit serving households.

3. Household loans, as broadly measured in this paper, consist of credit card loans, residential real estate loans, automobile loans and other household loans.

Figure 1.B
Growth Rate (in percent)

	Total Household Loans	Credit Card Loans	Residential Real Estate Loans	Automobile Loans	Other Household Loans
2001	4.0	n.a.	13.9	n.a.	n.a.
2002	11.8	13.8	8.3	22.4	10.0
2003	4.0	8.9	10.6	11.0	-1.1
2004	16.0	17.4	15.7	6.6	18.0
2005	9.0	19.6	16.7	22.6	-0.2
2006	9.3	20.3	24.3	17.9	-3.1
2007	14.6	16.5	9.5	19.4	14.4
2008	-10.8	12.6	37.1	-8.8	-45.7

Source: Supervisory Data Center, Bangko Sentral ng Pilipinas
Note: n.a. means no available data

Compared to other Asian countries, the ratio of the Philippine household sector's debt to total loan exposure of the domestic banking system remains one of the lowest at 18.3% as of end-2008, while the estimated regional average is around 32.4% (Figure 2).[4] However, credit card lending in the country as a

Figure2
Household Loans in Selected Asian Countries

	Hong Kong	South Korea	Indonesia	Malaysia	Philippines	Singapore	Thailand	AVERAGE
Household Loans (as a percent of total loans)								
2004	39.1	46.2	27.0	51.3	22.8	33.3	26.9	35.2
2005	37.0	47.3	29.7	54.4	24.4	30.7	28.3	36.0
2006	36.1	47.3	28.6	55.8	24.1	29.2	30.6	36.0
2007	33.8	43.3	28.2	55.2	24.9	26.2	31.5	34.7
2008	31.9	40.4	28.1	53.4	18.3	25.7	28.9	32.4
Credit Card Loans (as a percent of total loans)								
2004	2.7	4.4	2.1	2.8	3.9	1.1	1.3	2.6
2005	3.0	3.9	2.2	2.9	4.6	1.1	1.4	2.7
2006	3.1	3.4	2.3	3.3	5.0	1.1	1.5	2.8
2007	2.9	3.4	2.3	3.5	5.2	1.0	1.5	2.8
2008	2.6	3.4	2.3	3.4	4.9	1.0	1.4	2.7
Residential Real Estate Loans (as a percent of total loans)								
2004	31.8	28.5	7.5	26.0	4.0	19.3	3.4	17.2
2005	29.3	29.5	8.1	26.7	4.6	17.8	3.5	17.1
2006	28.0	29.8	9.2	27.4	5.1	17.2	3.3	17.1
2007	25.3	26.4	9.4	27.1	5.1	15.4	3.1	16.0
2008	24.0	24.8	9.4	26.5	5.7	14.7	3.4	15.5

Source: Executives' Meeting of East Asia-Pacific Central Banks (EMEAP)

4. Regional averages have been estimated using banking data from China, Japan, Hong Kong, South Korea, Indonesia, Malaysia, Philippines, Singapore and Thailand.

percentage of total loan exposure of the banking system has markedly increased and has been above the estimated regional average across the years. On the other hand, despite the upward trend in the ratio of residential real estate loans to total loan exposure of the banking system in the Philippines, it remains significantly below the estimated regional average of 15.5%.

The increase in the Philippine banking system's loan exposure to the household sector has allowed more people to access reliable and clean financing. However, this growth could come with a price for banks in the form of increased volume of non-performing loans (NPLs).[5] As shown in Figure 3, at an earlier stage of the credit card industry in the country, the ratio of non-performing credit card loans rose significantly to a peak of 20.6% in 2003. The non-performing credit card loans ratio were also above the non-performing loans ratio for total loans from 2003 to 2008. In the past, some of the reasons for the rise in the non-performing credit card loans were said to be the lack of understanding and familiarity of borrowers on the obligations and responsibilities associated with using credit cards as well as the lack of regulations governing these transactions.[6]

Figure 3
Non-Performing Loans Ratio (in percent)

	Non-performing Loans Ratio	
	Credit Card*	Total (Overall)**
2001	16.2	19.0
2002	13.5	16.6
2003	20.6	16.1
2004	18.8	14.4
2005	17.3	10.3
2006	15.8	7.5
2007	12.7	5.8
2008	11.7	4.1

Note: Computed as * percent of credit card non-performing loans to total credit card loans and ** percent of total non-performing loans to total loans.

5. Non-performing loans (NPL) refer to past due loan accounts whose principal and/or interest is unpaid for thirty (30) days or more after due date (applicable to loans payable in lump sum and loans payable in quarterly, semi-annual or annual installments), including the outstanding balance of loans payable in monthly installments when three (3) or more installments are in arrears, the outstanding balance of loans payable daily, weekly or semi-monthly installments when the total amount of arrears reaches ten percent (10%) of the total loan receivable balance, restructured loans which do not meet the requirements to be treated as performing loans under existing rules and regulations, and all items in litigation.

6. "Raising the Bar on Consumer Banking Service", speech of former Governor Rafael B. Buenaventura at the 30th Anniversary of the Bank Marketing Association of the Philippines on 26 August 2004.

Meanwhile, increased real estate exposure could also weaken the banking system as experienced in the 1997 Asian crisis. Prior to the crisis, several banking system reforms were implemented including the easing of restrictions on the entry of new banks into the system. In addition, the foreign exchange market liberalisation in the early 1990s involved the elimination of restrictions on the current account, and greatly reduced restrictions on the movement of capital flows. In turn, as noted by Gochoco-Bautista and Canlas (2003), the rise in foreign borrowing in the 1990s, which was mostly used to fund loans to the real estate sector, ultimately increased the vulnerability of the financial system when the peso sharply depreciated during the 1997 Asian crisis.[7] This developed as the cost of borrowings increased and the ability of borrowers to pay their real estate loans weakened during the crisis due to the depreciation of the peso and the economic slowdown.

1.2 Measures Implemented to Address Risks to Household Lending

In view of the possible impact of increasing household loans on the stability of the financial system, the Bangko Sentral ng Pilipinas (BSP) implemented several measures to address the risks posed by the banking system's loan exposure to the household sector, particularly through credit card and residential real estate loans.

On credit card loans, the BSP issued various regulations aimed at protecting both the public and banking industry. The BSP issued on 27 August 2002 Circular No. 349 which significantly tightened the rules on credit card and other lending operations by requiring banks and their subsidiary credit card companies to ascertain that cardholders are capable of fulfilling their commitments and by setting credit limits based on their net take-home pay. However, despite the issuance of BSP Circular No. 349, the non-performing loans ratio of credit cards continued to rise and reached a peak of 20.6% in 2003 (Figure 3). Thus, the BSP issued additional regulations that would improve the credit card environment in the country. On 23 August 2003, through Circular No. 398, the BSP required that the development of consumer credit through innovative products such as credit cards shall be under conditions of fair and sound consumer credit practices. Meanwhile, BSP Circular No. 454, issued on 24 September 2004, required the alignment of the credit card operations of banks in the country and their subsidiary credit card companies, including affiliates, with global best practices.

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7. Gochoco-Bautista, Maria Socorro and Dante Canlas (2003). "Monetary Exchange Rate Policy" in Balisacan, Arsenio and Hal Hill (editors), *The Philippine Economy: Development, Policies, and Challenges*. New York: Oxford University Press.

Considering that some of the credit card loan problems were due to the lack of understanding and familiarity of some card holders on the obligations and responsibilities associated with credit card services, the BSP also took a more proactive stand by creating the Consumer Education Committee in January 2004 to help improve basic financial learning. The BSP also embarked on economic and financial learning campaigns in 2005 that aimed to improve the basic financial knowledge of the public, including exporters as well as overseas Filipinos (OF) and their beneficiaries in the Philippines. At present, the BSP continues to impart basic knowledge on economics and financial learning through Public Information Campaigns (PIC).

Moreover, the Credit Information Act (Republic Act 9510) was enacted into law on 30 October 2008 to provide a comprehensive and centralised credit information system for the collection and dissemination of fair and accurate information relevant to credit and credit-related activities of all entities participating in the financial system.[8] The enactment of Republic Act 9510 could help provide reliable information on the credit worthiness of borrowers, cut credit processing time and lower transaction costs.

On real estate regulations, the BSP issued on 5 June 1997 Circular Letter No. 6 which prescribed a ceiling of 20% of a bank's total portfolio on commercial banks' loan to the real estate sector. Circular Letter No. 6 also set the reduction of allowable loan value to 60% (from 70%) of appraised value of the real estate collateral.

Furthermore, the BSP pursued the passage of the Special Purpose Vehicle Act (SPVA), a private sector-led mechanism for the disposal of non-performing loans. The passage of the law on 23 December 2002 helped improved the asset quality of banks and has reduced the total problem assets of the banking system to manageable levels. The BSP supplemented the financial incentives under the SPV Law with regulatory relief measures to jump start the asset clean-up. In 2006, the BSP allowed banks to enter into joint venture agreements (JVAs) with real estate developers to convert their idle real estate and other properties acquired (ROPA) into income-generating assets.

The BSP also enhanced corporate governance standards to safeguard the banking system against excessive risk-taking, ensure fair exercise of business

8. Philippine Senate. http://www.senate.gov.ph/republic_acts/ra%209510.pdf

transactions and promote consumer protection, and make the board of directors fully accountable to its shareholders and the public.

1.3 Impact of the Measures

Given the various banking regulations implemented in the Philippines to improve the quality of loans granted to credit card holders and real estate borrowers, the non-performing loans of the country's household sector declined in recent years.

The measures taken by the BSP to improve the quality of households' loans from the banking sector also recognised that the household sector plays an increasingly important role in the stability of the financial system. This developed as financial progress in the past decades brought greater integration and complexity in the relationships among the sectors of the economy. In particular, households (under the non-financial sector) are inter-linked with the financial sector through their deposits and loans.

At present, given the greater integration and dynamic inter-linkages among the sectoral balance sheets, deterioration in the balance sheet of households could weaken the banking system and pose a threat to financial stability, particularly during periods of capital flow reversal, rapid exchange rate depreciation or sharp interest rate hike. [9] According to the International Monetary Fund (IMF), deterioration in household repayment capacity and net worth due to income, interest rate, or exchange rate shocks may translate into higher accumulation of NPLs by banks. In turn, a rise in NPLs may impair the balance sheet of the financial sector. Given these considerations, the sustainability of household debt depends upon the corresponding level of household assets as well as the steady stream of future income.[10]

Furthermore, Mohanty and Turner (2008) noted that the substantial accumulation of household debt owed to the banking system has potential major implications for monetary transmission. First, an increase in household debt owed to the banking system could mean that changes in interest rates (arising from changes in policy rates), can in turn generate substantial income effects as a larger share of household income goes to debt-servicing payments. Second, changes in household balance sheets can lead to potential wealth effects,

9. M. Allen, C. Rosenberg, C. Keller, B. Setser and N. Roubini (2002). "A Balance Sheet Approach to Financial Crisis", International Monetary Fund, Working Paper No. 210.

10. International Monetary Fund (IMF, 2006), Global Financial Stability Report, Chapter II: Household Credit Growth in Emerging Market Economies.

particularly through the housing market since housing has become an important component of wealth in many countries. Third, changes in household balance sheets are linked to the cash flow effects of monetary policy on consumption and residential real estate investment. [11]

2. Review of Related Literature

Despite the vast literature on the household sector in the Philippines, only a few have focused on household indebtedness and its implications to the economy. One of these is the study of Tan (2008), which discusses consumer credit in the Philippines. [12] In his paper, Tan (2008) noted that the growth of retail lending in the country, especially unsecured lending, has been accompanied by high delinquency rates which could be, in part, due to the extension of credit to low-income earners. Moreover, before the legislation of the Credit Information Act (Republic Act 9510) in 2008,[13] the paper argues that high interest rates are levied on all credit card debt given the lack of credit data that would permit lenders to determine the quality of borrowers. The absence of credit bureaus prior to Republic Act 9510 impeded the provision of sound consumer debt data that would include, among other things, information on the credit worthiness of borrowers. The paper suggests that screening out borrowers with poor credit scores could reduce the default ratio and eventually lower average interest rates.

On the other hand, a study by the BSP (2003) suggests that Filipino consumers typically tend to rely more on their own income rather than on borrowing for their consumption needs.[14] This suggests that changes in the aggregate supply of credit, which tend to be reflected in the movements in domestic liquidity or M3, do not appear to significantly influence consumption in the Philippines, since consumers tend to rely more on their own income than on credit for financing their consumption.

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11. M. S. Mohanty and Philip Turner, (2008), "Monetary Policy Transmission in Emerging Market Economies: What is New?" Bank for International Settlements.

12. Winecito L. Tan, (2008), "Consumer Credit in the Philippines" from the compilation "Household Debt: Implications for Monetary Policy and Financial Stability". BIS Paper 46, Proceedings of a joint conference organised by the BIS and the Bank of Korea in Seoul on 28 March 2008.

13. The law paves the way for the establishment of the Central Credit Information Corp., which could provide reliable information on the credit worthiness of borrowers, cut credit processing times and lower transaction costs.

14. Bangko Sentral ng Pilipinas, (2003), Fourth Quarter Inflation Report.

Meanwhile, the IMF (2006) noted that in the Philippines, limitations on banks to lend only to taxpayers leave many households with no access to the formal credit sector. Thus, households could resort to borrowing from the informal credit sector. Such non-bank lending is not always formally supervised or reported, leading to an underestimation of aggregate credit growth to households.[15]

In terms of consumer credit in Asia, He, Yao and Li (2005) noted that the rapid growth of non-secured credit card debt raises a number of issues, such as their impact on financial stability: (1) whether risk management systems and supervisory practices should be strengthened in response to the new risks involved and (2) whether governments need to look at new requirements in financial sector infrastructure.[16] They noted that there are a number of channels through which the risks of credit card lending can affect financial and macroeconomic stability. First, it is difficult to price the risks correctly due to the newness of the product and the high volatility in borrower behavior patterns. Second, given that the distribution of the credit card portfolio is concentrated in a number of lenders (for example, specialised non-bank financial institutions), then the failure of these lenders could disrupt financial markets.

On the challenges to policymakers resulting from the growing credit card markets in Asia, the paper of Kang and Ma (2009) observed that the rising levels, rapid growth and shifting distribution of household debt may all pose risks to the region's financial system.[17] The dominant role of excessive cash lending is highlighted in all the three episodes of credit card lending boom-bust cycles in Asia identified by the paper. The paper notes that: (1) the episodes of credit distress in Asia highlight the importance of placing greater emphasis on the detection of early warning signs before imbalances build up excessively for too long; (2) governments can help enhance information flows to facilitate the functioning of consumer credit; (3) credit information sharing will become an even more important part of the financial market infrastructure; and (4) it might be necessary to upgrade the prudential and supervisory frameworks of financial systems.

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15. International Monetary Fund, (IMF, 2006), Global Financial Stability Report, Chapter II: Household Credit Growth in Emerging Market Economies.

16. Dong He, Effie Yao and Kim-hung Li, "The Growth of Consumer Credit in Asia". Published in the Hong Kong Monetary Authority Quarterly Bulletin, March 2005.

17. Tao Soo Kang and Guonan Ma, (2009), "Growing Credit Card Markets in Asia: Challenges to Policymakers". Forthcoming working paper of the Bank for International Settlements (BIS).

3. Philippine Household Credit Accumulation

In the Philippines, the household sector sources credit from the formal financial intermediaries, which are basically composed of financial institutions regulated by the central bank (BSP), and the informal credit markets.

As defined by Lamberte et al. (1989), the formal financial intermediaries may be grouped into three broad categories, namely: (1) institutions which regularly engage in the lending of funds obtained from the public in the form of deposits; (2) institutions which regularly engage in the lending of funds obtained from the public through the issuance of their own debt instruments other than deposits, such as acceptances, promissory notes, participations, etc; and (3) institutions which regularly engage in the lending of funds but do not obtain funds from the public. The first group may be identified as the banking system while the second and third categories belong to the non-bank financial intermediaries (NBFIs).[18]

The Philippine banking system comprises all duly licensed and registered financial institutions engaged in obtaining funds from the public primarily through acceptance of deposits received on a day-to-day basis from non-financial sources. Such institutions would include regular and expanded commercial (domestic and foreign) banks, thrift banks, specialised government banks and rural banks. Meanwhile, NBFIs refer to all financial institutions other than banks engaged principally in the provision of financial services. NBFIs run the gamut from pawnshops and lending investors to stock and money brokers to investment houses and financing companies to insurance companies and intermediaries performing quasi-banking functions.

The formal financial intermediaries under the supervision of the BSP are subject to the minimum capital requirement, although this varies across different types of financial entities. For, example, banks have higher capital requirements and are regularly monitored by the BSP compared with the supervised NBFIs.

According to Lamberte et al. (1989), financial intermediaries which do not fall under the direct supervision of the BSP belong to the informal credit markets. As such, these can be classified into two groups, namely, financial intermediaries which are: (1) registered with a particular government agency but are exempted by law from regulations imposed by the BSP (i.e. insurance companies and cooperative credit unions) and (2) not registered with any government agency (i.e. landlords).

18. Mario Lamberte, Mahar Mangahas, Ma. Alcestis Mangahas, (1989), "Integrative Report on the Informal Credit Markets in the Philippines".

In 1989, based on the study by Lamberte et al. (1989), loans availed from financial intermediaries supervised by the central bank amounted to 34% of household loans while 59% came from the informal credit markets. This developed, in part, as households belonging to the poor and low-income group found it difficult in the past to access credit from formal financial intermediaries, particularly banks, due to very strict lending requirements. Nevertheless, in recent years, the BSP has made substantial progress in promoting microfinance in the banking sector to improve access of the poor and low-income group to the financial system.[19] The BSP initiatives in microfinance followed a three-pronged approach: (1) providing the enabling policy and regulatory environment to promote micro-finance activities; (2) increasing the capacity of the BSP and the banking sector to engage in microfinance activities and operations; and (3) promoting the development of sound and sustainable microfinance operations.[20]

In the past eight years, the BSP has issued 17 regulations and undertaken various major activities for microfinance. Lately, new players, a wider range of products and services, technological innovations and applications, have driven much of the growth in microfinance in the Philippines.[21]

The results of these efforts were evident in the increasing number of banks engaged in microfinance operations. As of December 2008, there were a total of 221 banks engaged in microfinance from 119 banks in December 2002. These banks served *around 878,322 clients from about 390,635 clients in December 2002. Moreover,* microfinance loans increased to ₱6,380.3 million in December 2008 from ₱2,601.9 million in December 2002.

19. Microfinance loans are small loans granted to the basic sectors and other loans granted to the poor and low-income households for their micro-enterprises and small businesses so as to enable them to raise their income levels and improve their living standards.

20. Bangko Sentral ng Pilipinas, (2009), Unpublished BSP's Key Accomplishments: 2004 – 2009.

21. Ibid.

Figure 4
Microfinance Exposures of the Banking System

	31 December 2008			31 December 2002		
		Micro Loans Portfolio			Micro Loans Portfolio	
	No. of Banks	Amount (in millions)	No. of Borrowers	No. of Banks	Amount (in millions)	No. of Borrowers
Microfinance Oriented Banks:						
Thrift Banks	4	225.630	57,597	2	87.274	22,061
Rural Banks	5	724.100	128,494	2	6.003	570
Sub-Total	9	949.730	186,091	4	93.277	22,631
Rural Banks	167	4,099.680	593,874	88	1,823.520	253,646
Cooperative Banks	25	921.400	88,257	27	685.089	114,358
Thrift Banks	20	409.500	10,100			
Total	221	6,380.310	878,322	119	2,601.886	390,635

Source: Bangko Sentral ng Pilipinas

Meanwhile, in terms of the regular loans from the banking system, estimate of Philippine households' debt from the financial sector indicated manageable levels given the sector's sufficient financial assets and disposable income (Figures 5.A – 5.C). Despite the increase in the ratio of household debt to its financial assets to 19.9% in 2007 from 11.1% in 2000, the estimated ratio of household debt to liquid financial assets decreased to 131.7% in 2007 from 168.9% in 2000. This developed as the share of household deposits to the estimated total financial assets of households increased to 16.7% in 2007 from 2.3% in 2000. At the same time, the ratio of household debt to disposable income remained firm at 11.6% in 2007 from 10.3% in 2000 while the ratio of household debt to the country's gross domestic product decreased to 8.3% in 2007 from 8.6% in 2000.

Figure 5.A
Estimate of Household Financial Assets
(in percent of total financial assets of households)

	Insurance	Employees Retirement Fund	Securities, Shares and Equity	Household Deposits to Banks
2000	87.0	6.4	4.3	2.3
2001	81.2	9.4	5.9	3.5
2002	84.6	10.6	1.2	3.6
2003	81.5	9.5	5.5	3.5
2004	79.5	11.3	4.0	5.1
2005	73.7	15.5	0.2	10.7
2006	73.4	15.6	-3.6	14.6
2007	69.5	15.3	-1.6	16.7

Figure 5.B
National Output and Household Loans, Assets and Income
(in million pesos)

	Household Loans from Banks	Household Total Financial Assets	Disposable Income	GDP
2000	288,137	2,594,914		3,354,727
2001	299,708	2,013,303	2,903,116	3,631,474
2002	334,942	2,052,203	2,776,361	3,963,873
2003	348,257	2,705,956	3,051,184	4,316,402
2004	403,825	2,544,327	3,518,740	4,871,555
2005	440,091	2,182,322	3,943,590	5,444,039
2006	481,189	2,411,107	4,332,386	6,031,164
2007	551,325	2,768,964	4,772,578	6,647,338

Figure 5.C
Household Debt (Loans from Banks) Indicators
(in percent)

	Debt To Financial Assets[22]	Debt to Liquid Financial Assets	Debt to Disposable Income	Debt to GDP
2000	11.1	168.9		8.6
2001	14.9	158.4	10.3	8.3
2002	16.3	339.8	12.1	8.4
2003	12.9	142.6	11.4	8.1
2004	15.9	173.0	11.5	8.3
2005	20.2	186.3	11.2	8.1
2006	20.0	181.1	11.1	8.0
2007	19.9	131.7	11.6	8.3

Sources: Supervisory Data Center (SDC) of the Bangko Sentral ng Pilipinas (BSP), Flow of Funds from the BSP, Insurance Commission, Government Service Insurance System (GSIS) and the National Statistical Coordination Board.

22. Financial assets consist of insurance, employees' retirement fund, securities, shares, equities, and deposits. Meanwhile, liquid financial assets consist of deposits, securities, shares and equities.

During the global financial crisis in 2008, the rise in some Philippine households' debt ratios was accompanied by a slowdown in household spending while household income and savings remained sufficient based on some approximate indicators. Taking into consideration the uncertainty in the economic and financial environment, Philippine households appear to have embarked on consolidating their financial positions and obligations amid concerns over the possible decline in overseas Filipinos' (OFs) remittances and employment opportunities. The increase in general price levels in 2008 and the subsequent concerns over the employment outlook in 2009 may have led households to reassess their financial capacity to weather the more difficult economic conditions ahead.

Household spending in the Philippines, as broadly measured by the personal consumption expenditure (PCE) at constant prices from the National Income Accounts (NIA), grew by 4.5% in 2008, a slowdown from the 5.8% growth in 2007. Concerns on elevated prices of oil and commodity items and the exceptionally challenging external environment in 2008 restrained the pattern of household spending behavior.

Adding to the household challenges in 2008, unemployment in the Philippines increased to 7.4% in 2008 from 7.3% in 2007. Meanwhile, real daily wage rate, a leading indicator of household income, decreased slightly to ₱245.42 in 2008 from ₱245.61 in 2007 as the nominal wage rate remained almost unchanged while inflation rose.[23] On the other hand, per capita GDP (at constant prices) reached ₱17,553 in 2008, higher than the ₱16,860 in 2007. Moreover, remittances of overseas Filipinos (OF) coursed through banks and reached US$16.4 billion in 2008, 13.7% higher than the level recorded in 2007 and slightly above the BSP's growth forecast of US$16.3 billion.

Driven by challenges brought about by the current economic and financial environment, Philippine households have increased their reliance on bank credit to fund their spending needs (Figure 6). In particular, households' credit card payables reached ₱130.7 billion in December 2008 from ₱115.5 billion in March 2008. Likewise, residential real estate loans increased to ₱153.9 billion by end-2008 from ₱120.5 billion in March 2008. Auto loans payables also increased to ₱78.6 billion in December 2008 from ₱76.6 billion in March 2008.

23. Real wages are nominal wage rates deflated by the 2000 Consumer Price Index. Nominal wage rate refers to basic pay and cost of living allowances (COLA).

As the Philippine households' usage of credit cards increased, the ratio of non-performing credit card loans also increased from 10.2% in March 2008 to 11.6% in June but remained steady at 11.7% in September and December 2008. On the other hand, the non-performing loans ratios for both auto loans and residential real estate loans went down in December 2008.

Figure 6
Payables of the Household Sector in 2008

	Mar	Jun	Sep	Dec
Levels (in billion pesos)				
Credit card loans	115.5	122.6	124.4	130.7
Auto loans	76.6	79.1	77.2	78.6
Residential real estate loans	120.5	138	143.7	153.9
Non-performing Loans to Loans per Category (in percent)				
Credit card loans	10.2	11.6	11.7	11.7
Auto loans	5.6	5.1	5.1	4.9
Residential real estate loans	7.6	8.1	7.7	7.0
Non-performing Loans to Total Loan Portfolio (TLP) (in percent)				
Credit card loans	0.6	0.6	0.6	0.6
Auto loans	0.2	0.2	0.2	0.1
Residential real estate loans			0.5	0.4

Source: Bangko Sentral ng Pilipinas

On the whole, the country's household debt remains manageable despite the possible decline in household income and savings, thus it is not expected to pose any significant threat to the overall stability of the financial system. Notwithstanding this, given the uncertain pace of global economic recovery during which the household sector's earning and debt-servicing capacity could weaken, the situation warrants close monitoring since a continued increase in the households' credit accumulation could affect the balance sheet of the banking system as well as the overall stability of the financial system.

4. Factors behind the Rise of Household Indebtedness

As discussed in the previous sections, the level of household indebtedness can be affected by macroeconomic developments. In view of this, and in the process of assessing the impact of household indebtedness on the stability of the

financial system in the Philippines, this section covers a review of the developments in the economy and policy setting which could have influenced the level of household indebtedness in the country. An overview of the 1990s is presented at the start of the review while more detailed discussions are focused on the developments from 2000 to 2008.

4.1 Output

The 1990s saw moderate growth in the economy as indicated by the 3.4% average annual growth of real GDP for the period 1990 - 1999. Initially, however, setbacks in the early 1990s arose due to natural disasters and external shocks which were compounded by policy slippages and real currency appreciation, which led to a sharp increase in the current account deficit and inflation. To reduce these economic imbalances, the Philippine government initiated a comprehensive liberalisation reform on foreign exchange regulations, aimed at further opening the economy and addressing structural rigidities.

The foreign exchange market liberalisation in the early 1990s involved the elimination of restrictions on the current account, and greatly reduced restrictions on the movement of capital flows. After the foreign exchange liberalisation of the early 1990s, both the banking system and corporate sector showed signs of overborrowing and declining productivity particularly in the preceding years leading up to the Asian crisis.[24]

Nevertheless, the Philippine economy recovered and sustained its growth momentum from 2000 to 2007, excluding a slight setback in 2001. Market sentiments were generally shaky around 2001 due to domestic political upheavals and the slowdown in the global economy. Demand for Philippine exports, particularly by its major trading partners, decreased significantly from a 17.7% growth in 2000 to a contraction of 3.4% in 2001. This decrease in demand for exports was also reflected in the decrease in the growth rate of the industry sector which slowed down from 4.9% in 2000 to a decline of 2.5% in 2001.

As the global economy begun to pick up again in 2002, the Philippine economy started to perform strongly with real GDP expanding at 4.3%. In 2003, despite negative sentiments on domestic issues and the Iraq war, real GDP continued to grow at 4.7%. In 2004, the Philippine economy sustained a strong momentum as indicated by a 6.9% growth in real GDP, overcoming the cautious mood of

24. Balisacan, Arsenio and Hal Hill, (2003), "The Philippine Economy: Development, Policies and Challenges". New York: Oxford University Press.

investors on the outcome of the Philippine national elections. The growth in GDP was underpinned by strong consumer spending and expansion in exports on the demand side and the robust output in the services and industry sectors on the production side.

The Philippine economy continued to grow in the three succeeding years as the GDP expanded by 5.0%, 5.4% and 7.2% in 2005, 2006, and 2007, respectively. In particular, the Philippine economy recorded a strong performance in 2007, boosted by the expansion of the services sector and the favorable performance of the agriculture and industry sectors. On the demand side, government consumption and fixed capital formation were the main drivers of growth, aided by the accelerated growth in personal consumption expenditure.

In 2008, the Philippine economy sustained a 3.8% growth despite the difficult external environment during the year. Economic expansion was led by the industry sector and supported by the services and agriculture sectors. On the demand side, personal consumption expenditure and government consumption were the main drivers of growth.

Figure 7
Annual Growth Rate of Gross Domestic Product (GDP) and Gross National Product (GNP)

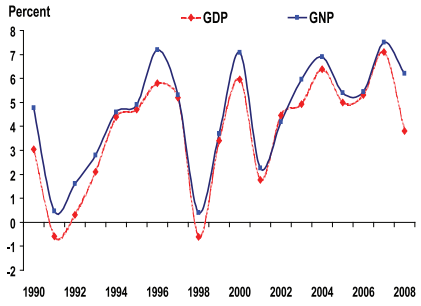
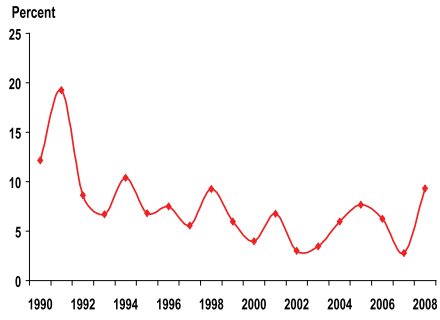


Figure 8
Headline Inflation



Sources: National Statistical Coordination Board (NSCB) National Statistics Office (NSO)

4.2 Inflation

Average annual inflation from 1990 to 1999 reached 9.2% on account of the elevated prices of oil in the early 1990s, strong consumer demand towards the middle of the period and the aftermath of the 1997 Asian crisis.

Inflation eased to 4.0% in 2000. However, reflecting the uncertainties brought about by a bleak global scenario in 2001, inflation rose again to 6.8% during the year, relatively higher than the 3.0% in 2002. Likewise, uncertainties arising from the US-Iraq conflict in 2003 brought upside risks to inflation. This sentiment was reflected in the increase in inflation to 3.5% in 2003.

Inflation continued to rise in 2004 to 6.0% triggered by elevated fuel prices and subsequent adjustments in transport fares, electricity charges and basic food prices. Inflation rose further in 2005 to 7.6%, reflecting the impact of sharply higher world oil prices and the occurrence of a mild El Niño in the early part of the year, which affected agricultural production. Thereafter, inflation generally declined reflecting the easing of global oil prices and a stronger peso. This resulted in the easing of inflation to 6.3% in 2006 and 2.8% in 2007, the lowest since 1986. However, as global prices of oil and non-oil commodities rose in the first half of 2008, inflation rose to a 9.3% average for the year.

4.3 Interest Rates

During the 1997 Asian crisis, the monetary policy stance of the BSP was geared towards containing inflation and restoring stability in the foreign exchange market. At the onset of the 1997 Asian crisis, nominal interest rates rose sharply to record levels due to the volatility in the regional currency markets. To restore some stability in the foreign exchange market, the BSP allowed the peso to freely find its level and took a series of temporary upward adjustments in its policy interest rates. The BSP also raised liquidity reserves of banks to lock in their excess liquidity into Treasury instruments purchased from the BSP. Eventually, as the country's financial and economic situation gained some stability in the early months of 1998, the BSP lowered its policy interest rates, reduced liquidity reserves, and implemented steps to inject liquidity in the system. The move to reduce the policy rates further paved the way for the general downtrend in domestic interest rates.

The BSP in its effort to keep interest rates stable continued to reduce the policy rates in the succeeding years after the 1997 Asian Crisis. Moreover, as a response to the slowdown in external and domestic demand in 2001, the BSP

lowered its policy rates by a total of 575 basis points during the year. This brought the overnight borrowing or reverse repurchase (RRP) rate and the overnight lending or repurchase (RP) to 7.75% and 10.0%, respectively, by end-2001. In the first three months of 2002, the BSP continued to lower the policy rates by a total of 75 basis points until the economy started to show signs of recovery.

However, amid the rising inflation in 2003, the BSP raised the liquidity reserve requirement against peso deposit liabilities of banks and encouraged greater bank placements with the BSP. But as the upside risks to inflation tapered off, the tiering scheme on placements of banks was restored in June 2003 but was again lifted in August 2003. Policy interest rates were reduced by 25 basis points in July 2003 and were maintained for the rest of the year to ensure adequate liquidity for economic growth.

In 2004, the BSP kept a steady hand on policy interest rates despite inflation rising above the target range, as it maintained the overnight borrowing rate at 6.75% and the overnight lending at 9.0%. However, in 2005, the BSP increased its key policy interest rates three times for a cumulative 75 basis points hike to address possible second-round effects of supply-side shocks arising from the rise in oil prices and the decline in production due to the El Niño phenomenon. In 2006, the decelerating path for inflation and the expectations of a manageable inflation environment allowed the BSP to keep a steady hand on monetary policy settings. The BSP also revived the tiering system on banks' placements at the BSP's RRP window to encourage banks to lend their excess funds and foster productive activity.

The BSP reduced its policy rates four times in 2007 given a favorable inflation outlook. Rates were cut by a cumulative 225 percentage and the tiering system on banks' placements with the BSP was also abolished. In January 2008, the BSP policy rates were further reduced by 25 basis points. However, the sharp rise in global oil and food prices in 2008 subsequently led the BSP to raise policy rates in June, July and August 2008 by a total of 100 basis points. The upward trend in the policy rates changed in the latter half of the year as the inflation outlook showed sharply diminished inflation pressure due to the slowdown in global and domestic economic activity. As a result, the BSP decided in December 2008 to reduce by 50 basis points the overnight borrowing rate and the overnight lending rate to 5.5% and 7.5%, respectively. The reduction in the policy interest rates was aimed at reducing domestic borrowing costs, which could stimulate consumer spending and assist in the financing of economic activity.

Overall, the short-term Treasury bill rates, the interest rates on bank loans and deposits followed the general trend of the BSP policy rates.

Figure 9.A
Annual Nominal Interest Rate

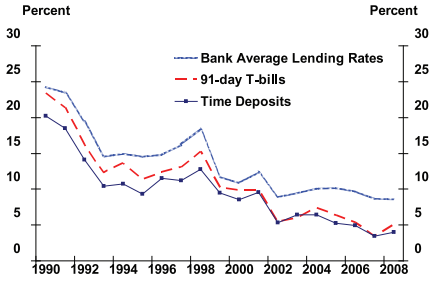
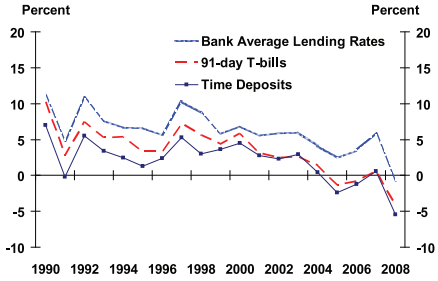


Figure 9.B
Annual Real Interest Rate



Source: Bangko Sentral ng Pilipinas

4.4 Unemployment

The unemployment rate averaged at 9.2% for the period 1990 – 1999. However, despite the country's strong economic growth from 2000 to 2007, the average unemployment rate reached 11% during this period. This developed as the expansion in the number of employed was accompanied by the equivalent increase in the number of workers that participated in the labor force. Meanwhile, average real wage rate increased to ₱243.5 for the period 2000 – 2008 from ₱91.3 for 1990 – 1999.

5. Assessment of Household Debt Vulnerability

5.1 Methodology

In the study of the determinants of Philippine household indebtedness and its impact on the country's financial stability, quarterly data from March 2001 to March 2009 of the following variables were used in the analysis:

- Household Loan (individual loan, credit card loan, residential real estate loan);
- Total non-performing loan;
- Weighted average lending rate from selected universal and commercial banks;

- Unemployment rate; and
- Expenditure on personal consumption (nominal).

The period coverage was limited by the availability of the data. Quarterly data for some of the variables, particularly the household indebtedness indicators, were generated only starting March 2001.

In this study, the non-performing loans (NPLs) serve as an indicator of the financial stability of the banking system, such that a significant increase in this variable could imply heightened risk in the system. However, as illustrated in the 1997 Asian crisis, this could take some time to manifest in the banking system. The impact of the 1997 Asian crisis on the Philippine banking system took some time to manifest itself with the non-performing loans rising significantly to around 20.1% starting only in 2002, more than three years after the outbreak.

Meanwhile loans to individuals (household), credit card loans and residential real estate loans are the broad measure of household indebtedness, which could pose as contributing factors in the assessment of financial stability.

The weighted average lending rate, unemployment rate and personal consumption expenditure (PCE) were the macroeconomic indicators used as possible determinants of household indebtedness as well as additional factors contributing to the movements of the non-performing loans. The weighted average lending rate, referred to as lending rate from here on, serves as a measure of the cost of household borrowing from the banking system. The unemployment rate is a broad measure of household income and capacity to pay.

Two Ordinary Least Squares (OLS) models, with some variant models to account for the lag effect of the factors, were developed to explain the determinants of household indebtedness and its impact on financial stability.

Model 1: Determinants of Household Indebtedness

$$Log(HLoans)_t = \alpha + \beta_1 i_t + \beta_2 u_t + \beta_3 Log(PCE)_t + \beta_{jt} X_{j(t-i)} \varepsilon_t \qquad \text{(Eq. 1)}$$

Where $Log\ (HLoans)_t$ = log of household loans from the banking system at time t;

i_t = average bank lending rate at time t;

u_t = unemployment rate at time t;

$Log(PCE)_t$ = log of personal consumption expenditure at time t;

$X_{j(t-i)}$ = lagged of jth explanatory variable; and
ε_t = error.

Model 2: Implications of Household Indebtedness on Financial Stability

$$\text{Log}(NPL)_t = \alpha + \beta_1 Log(CCLoan)_t + \beta_2 Log(RRLoan)_t + \beta_3 Log(CorpLoan)_t + \beta_4 u_t + \beta_{jt} X_{j\ (t-i)} + \varepsilon_t \quad \text{(Eq. 2)}$$

Where $Log\ (NPL)_t$ = log of non-performing loans at time t;
$Log(CCLoan)_t$ = log of credit card loans at time t;
$Log(RRLoan)_t$ = log of residential real estate loans at time t;
$Log(CorpLoan)_t$ = log of corporate loans at time t;
u_t = unemployment rate at time t;
$X_{j(t-i)}$ = lagged of jth explanatory variable; and
e_t = error.

5.2 Results

5.2.1 Determinants of Household Indebtedness

The results of the OLS modeling in Figures 10 and 11 show that the average lending rate and household consumption, as measured by the PCE, have significant impact on credit card and residential real estate loans.

The results indicate that the lending rate has a significant inverse effect on credit card and residential real estate loans, such that household borrowing from banks is constrained by an increase in the cost of borrowing from banks. In addition, an increase in household consumption expenditure could also result in an increase in household indebtedness. This could have developed following the increasing trend in credit card usage and reliance of household on loan acquisition for their financing needs.

Figure 10
Ordinary Least Squares (OLS): Log of Credit Card Loans as Dependent Variable

Explanatory Variables	Model 1.1.1	Model 1.1.2	Model 1.1.3
Constant (C)	-4.857***	-5.490***	-5.714***
	(0.692)	*(0.756)*	*(0.848)*
Lending Rate	-0.034***	-0.027**	-0.024*
	(0.011)	*(0.011)*	*(0.012)*
Log PCE	1.393***	1.113***	0.977***
	(0.083)	*(0.124)*	*(0.204)*
Log PCE (Lag 1)		0.354**	0.309**
		(0.129)	*(0.143)*
Log PCE (Lag 2)			-0.002
			(0.010)
Unemployment	-0.003	0.001	-0.002
	(0.009)	*(0.009)*	*(0.010)*
Unemployment (Lag 1)		0.003	0.005
		(0.009)	*(0.010)*
Unemployment (Lag 2)			0.003
			(0.009)
R-Squared	0.977	0.981	0.979
F-Statistic	414.228***	263.898***	156.928***
Prob (F-Statistic)	0.000	0.000	0.000
Durbin-Watson Statistic	2.711	2.430	2.382

Notes: (1) Figures inside parenthesis is the standard error of the corresponding statistic; (2) * indicates the coefficient is significant at 10% level of significance; (2) ** indicates the coefficient is significant at 5% level of significance and (3) *** indicates the coefficient is significant at 1% level of significance.

Figure 11
Ordinary Least Squares (OLS): Log of Residential Real Estate Loans as Dependent Variable

Variables	Model 1.2.1	Model 1.2.2	Model 1.2.3
Constant (C)	-4.391***	-5.581***	-5.849***
	(1.051)	*(0.731)*	*(0.710)*
Lending Rate	-0.032***	-0.026**	-0.0134
	(0.017)	*(0.010)*	*(0.010)*
Log PCE	1.332***	0.742***	0.507***
	(0.126)	*(0.120)*	*(0.171)*
Log PCE (Lag 1)		0.744***	0.639***
		(0.125)	*(0.120)*
Log PCE (Lag 2)			-0.364*
			(0.193)
Unemployment	-0.002	0.016*	-0.014
	(0.014)	*(0.009)*	*(0.008)*
Unemployment (Lag 1)		-0.008	-0.004
		(0.009)	*(0.001)*
Unemployment (Lag 2)			0.002
			(0.008)
R-Squared	0.944	0.982	0.985
F-Statistic	162.478	279.255	218.288
Prob (F-Statistic)	0.000	0.000	0.000
Durbin-Watson Statistic	1.959	1.315	1.146

Notes: (1) Figures inside parenthesis is the standard error of the corresponding statistic; (2) * indicates the coefficient is significant at 10% level of significance; (2) ** indicates the coefficient is significant at 5% level of significance and (3) *** indicates the coefficient is significant at 1% level of significance.

Figure 12
Ordinary Least Squares (OLS): Log of Total Household Loans as Dependent Variable

Variables	Model 1.3.1	Model 1.3.2	Model 1.3.3
Constant (C)	-0.548	0.566	0.462***
	(0.568)	*(0.634)*	*(0.708)*
Lending Rate	-0.013	-0.014	-0.011
	(0.009)	*(0.009)*	*(0.010)*
Log PCE	0.257**	0.314***	0.256
	(0.106)	*(0.113)*	*(0.171)*
Log PCE (Lag 1)		-0.162	-0.187
		(0.126)	*(0.135)*
Log PCE (Lag 2)			-0.100
			(0.193)
Unemployment	0.003	0.001	-0.001
	(0.007)	*(0.007)*	*(0.009)*
Unemployment (Lag 1)		0.002	-0.002
		(0.007)	*(0.009)*
Unemployment (Lag 2)			0.001
			(0.008)
Log Household Loan (Lag 1)	0.633***	0.752***	0.743***
	(0.125)	*(0.149)*	*(0.159)*
R-Squared	0.950	0.954	0.951
F-Statistic	129.311	27.255	53.341
Prob (F-Statistic)	0.000	0.000	0.000
Durbin-Watson Statistic	1.981	2.276	2.308

Notes: (1) Figures inside parenthesis is the standard error of the corresponding statistic; (2) * indicates the coefficient is significant at 10% level of significance; (2) ** indicates the coefficient is significant at 5% level of significance and (3) *** indicates the coefficient is significant at 1% level of significance.

Based on Figure 13A, notable spikes in the average bank lending rate in the latter part of 2001 and in 2003 were also accompanied by a decrease in the outstanding credit card loan exposure of the banking system. On the other hand, the outstanding credit card loan exposure of the banking system increased during the period of downward trend in the average bank lending rate from mid-2006 to mid-2007. These movements could be explained, in part, by the relationship between household borrowing behavior and the cost of borrowing (i.e. as the borrowing cost increases, household loans decreases) as estimated in Figure 10.

Figure 13A
Quarterly Credit Card Loan vs Lending Rate

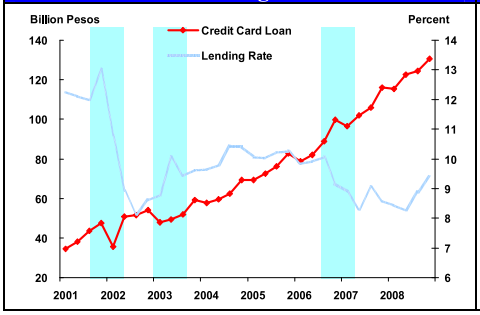
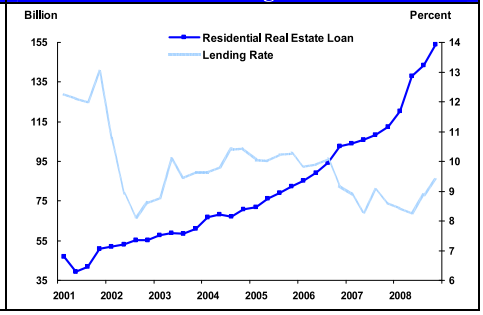


Figure 13B
Quarterly Residential Real Estate Loan vs Lending Rate



Source: Bangko Sentral ng Pilipinas

Notes: Figure 3.a left-hand side axis includes credit card loans while right-hand side axis includes lending rate. Figure 3.b left-hand side axis includes residential real estate loans while right-hand side axis includes lending rate.

5.2.2 Implications of Household Indebtedness to Financial Stability

Figure 14 shows that based on Models 2.1.1 to 2.1.3, credit card loans have a significant inverse effect on non-performing loans. Perhaps, in part, this is due to the implementation of regulations on higher risk weight on non-performing loans and the credit-tightening behavior of banks during periods of risk aversion.[25]

Meanwhile, unemployment has a significant positive relationship with non-performing loans as shown in Figures 14 and 15. This indicates that as the earning and debt-servicing capacity of the Philippine household sector deteriorates, non-performing loans could increase.

Model 2.2.1 of Figure 15 shows that residential real estate loans have a significant inverse effect on non-performing loans. Similar to the explanation of credit card loans, the inverse relationship between NPLs and residential real estate loans could have been the result of the regulations on higher risk weight on non-performing loans as well as the implementation of the SPV Laws.[26]

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25. Imposition of higher risk weight of 150% from 125% on non-performing loans (NPLs) under the Basel II in 2007.

26. Imposition of higher risk weight of 100%, from 75%, in 2007 on NPLs for housing purpose, fully secured by first mortgage on residential property or will be occupied or leased out by the borrower.

Figure 14
Ordinary Least Squares (OLS): Log of Total Non-Performing Loans as Dependent Variable (Log of Credit Card Loans as Independent Variable)

Variables	Model 2.1.1	Model 2.1.2	Model 2.1.3
Constant (C)	2.793***	2.875***	5.126***
	(0.600)	*(0.737)*	*(0.969)*
Log Credit Card Loan	-0.270***	-0.284***	-0.331***
	(0.060)	*(0.086)*	*(0.089)*
Log Credit Card Loan (Lag 1)		0.011	-0.048
		(0.087)	*(0.093)*
Log Credit Card Loan (Lag 2)			-0.090
			(0.098)
Unemployment	0.013**	0.013*	0.024***
	(0.06)	*(0.007)*	*(0.007)*
Unemployment (Lag 1)		0.003	0.001
		(0.007)	*(0.007)*
Unemployment (Lag 2)			0.012*
			(0.006)
Log NPL(Lag 1)	0.665***	0.648***	0.342**
	(0.071)	*(0.093)*	*(0.129)*
R-Squared	0.988	0.988	0.992
F-Statistic	787.798	441.901	388.374
Prob (F-Statistic)	0.000	0.000	0.000
Durbin-Watson Statistic	2.104	2.101	1.898

Notes: (1) Figures inside parenthesis is the standard error of the corresponding statistic; (2) * indicates the coefficient is significant at 10% level of significance; (2) ** indicates the coefficient is significant at 5% level of significance and (3) *** indicates the coefficient is significant at 1% level of significance.

Figure 15
Ordinary Least Squares (OLS): Log of Total Non-Performing Loans as Dependent Variable (Log of Residential Real Estate Loans as Independent Variable)

Variables	Model 2.2.1	Model 2.2.2	Model 2.2.3
Constant (C)	1.911**	2.538***	4.239***
	(0.983)	*(0.909)*	*(1.361)*
Log Residential Real Estate Loan	-0.173**	0.067	-0.127
	(0.073)	*(0.175)*	*(0.248)*
Log Residential Real Estate Loan (Lag 1)		-0.301	0.054
		(0.202)	*(0.291)*
Log Residential Real Estate Loan (Lag 2)			-0.311
			(0.215)
Unemployment	0.016**	0.023**	0.028***
	(0.007)	*(0.009)*	*(0.009)*
Unemployment (Lag 1)		-0.002	0.005
		(0.008)	*(0.010)*
Unemployment (Lag 2)			0.006
			(0.008)
Log NPL(Lag 1)	0.750***	0.671***	0.443**
	(0.090)	*(0.120)*	*(0.184)*
R-Squared	0.983	0.988	0.986
F-Statistic	545.971	441.901	230.231
Prob (F-Statistic)	0.000	0.000	0.000
Durbin-Watson Statistic	1.907	2.101	1.827

Notes: (1) Figures inside parenthesis is the standard error of the corresponding statistic; (2) * indicates the coefficient is significant at 10% level of significance; (2) ** indicates the coefficient is significant at 5% level of significance and (3) *** indicates the coefficient is significant at 1% level of significance.

Figure 16
Ordinary Least Squares (OLS): Log of Total Non-Performing Loans as Dependent Variable (Log of Total Household Loans as Independent Variable)

Variables	Model 2.3.1	Model 2.3.2	Model 2.3.3
Constant (C)	3.214***	3.191***	3.753***
	(0.749)	*(0.922)*	*(1.212)*
Log Total Household Loan	-0.352***	-0.351**	-0.392**
	(0.085)	*(0.155)*	*(0.175)*
Log Total Household Loan (Lag 1)		-0.0001	0.045
		(0.173)	*(0.1989*
Log Total Household Loan (Lag 2)			0.035
			(0.191
Unemployment	0.012*	0.013*	0.016**
	(0.006)	*(0.007)*	*(0.008*
Unemployment (Lag 1)		-0.0001	-0.001
		(0.007)	*(0.007*
Unemployment (Lag 2)			0.004
			(0.007
Log NPL(Lag 1)	0.766***	0.770***	0.711***
	(0.057)	*(0.077)*	*(0.110)*
R-Squared	0.987	0.987	0.987
F-Statistic	735.915	410.121	266.544
Prob (F-Statistic)	0.000	0.000	0.000
Durbin-Watson Statistic	2.290	2.298	2.260

Notes: (1) Figures inside parenthesis is the standard error of the corresponding statistic; (2) * indicates the coefficient is significant at 10% level of significance; (2) ** indicates the coefficient is significant at 5% level of significance and (3) *** indicates the coefficient is significant at 1% level of significance.

Theoretically, household loans and non-performing loans were expected to have positive relationship since as the former increases, the possibility of default or bad loans also increases. However, the actual inverse relationship between the NPLs and household loans may have developed due to the country's regulations which focused on reducing non-performing loans (Figure 17A). Aside from the regulations, banks could resort to credit tightening behavior during periods of risk aversion, which could also coincide with an increase in non-performing loans. As such, elevated NPLs for a particular period would result in a decrease in household borrowing.

Figure 17A
Non-performing Loans against Household Loans

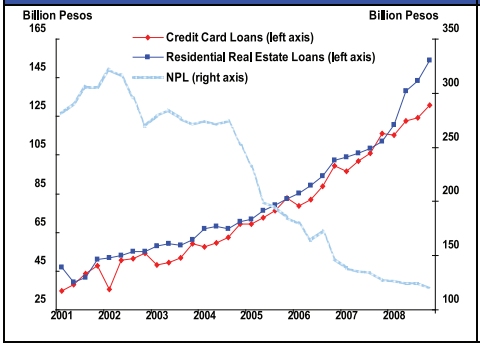
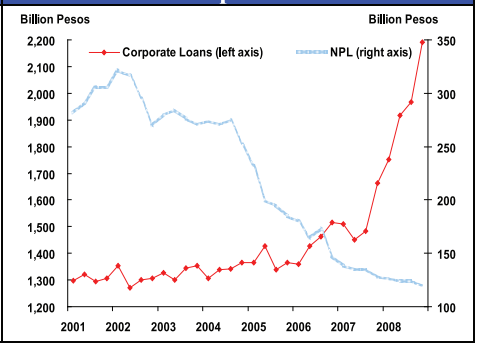


Figure 17B
Non-performing Loans against Corporate Loans



The non-performing loans ratio reached 4.7% as of end-March 2009, significantly lower than its peak of 20.1% in 2002. One of the identified factors behind the decline in NPL is the passage of the Special Purpose Vehicle (SPV) Laws in 2002 and 2006, which facilitated the creation of a private sector-led mechanism for the disposal of non-performing loans. As shown in Figure 18, a total of ₱120.0 billion of non-performing loans have been offloaded under SPV Phase I in 2003 and Phase II in 2006.

Figure 18
Non-Performing Assets Transferred Under SPV Phase 1 and 2
(billion pesos)

Type of NPA	Phase I Implementation (2003)	Phase II Implementation (2006)	Total
NPLs	88.020	31.959	119.979
ROPAs	8.649	17.604	26.253
Total	96.669	49.563	146.232

Source: Supervisory Data Center
Note: ROPA means real estate and other properties acquired

In addition to the SPV Laws, a risk weight of 150% on non-performing loans was imposed when Basel II was implemented in 2007, higher than the 125% risk-weight implemented under BSP Circular 475 dated 14 February 2005. A higher risk weight of 100% (from 75% under BSP Circular 475) on NPLs for housing purposes, fully secured by first mortgage on residential property, was also implemented in 2007. These measures helped to keep the non-performing loans of the banking system under manageable levels.

It has also been observed that during periods of risk aversion, which usually coincides with a marked increase in NPLs, banks could resort to credit tightening. During the recent global financial crisis, household loans decreased markedly to ₱462.5 billion in the first quarter of 2008 from ₱551.3 billion in end-2007 (Figure 19B). On the other hand, the volume of transactions of 364-day Treasury bills in the primary market went up to ₱8,125 billion from ₱4,135 billion during the same period. These developments reflected the risk-averse behavior of banks during the period, such that they reduced their loan exposure to the household sector and, instead, shifted more of their portfolio to the safer government securities, particularly the longer-term 364-day Treasury bill.

Figure 19A
Volume of Transaction in the Primary Market for Government Securities against Movement of the PSEi

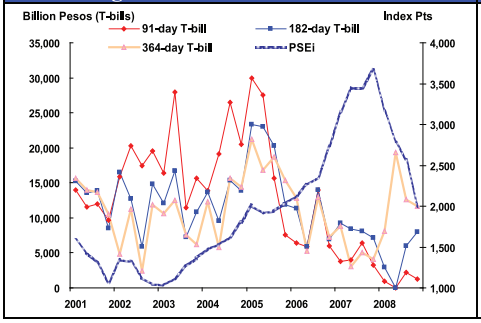
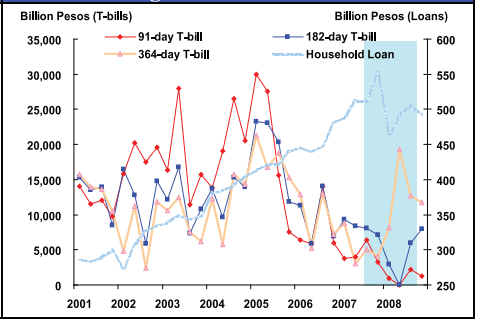


Figure 19B
Volume of Transaction in the Primary Market for Government Securities against Household Loan



6. Conclusion and Policy Implications

The household sector is closely associated with the financial system, as it plays the dual role of savers and borrowers of funds, with the financial sector serving as intermediary. On one hand, household credit accumulation and spending is influenced by the cost and accessibility of financing from the financial system. On the other hand, the stability of the financial system is affected by the soundness and financial health of the household sector as bank loans to the latter form an important part of the balance sheet of the former.

In the Philippines, the household sector plays an important role in the financial system as it accounts for almost twenty percent of total loan exposure of the banking system. As such, changes in the country's household sector's financial wealth have significant implications in terms of their debt repayment capacity and the overall stability of the financial system.

Nevertheless, at present, Philippine households' debt remains manageable, and is not expected to pose any significant threat to the overall stability of the county's financial system. Furthermore, the Ordinary Least Squares (OLS) modeling results in respect of the determinants of household indebtedness suggest that the interest rate channel remains an effective policy transmission mechanism in managing the flow of credit in the banking system, particularly the Philippine households' credit accumulation. The results are also consistent with the inflation targeting framework where the BSP closely monitors developments in household consumption expenditure and credit accumulation which could pose potential risk to the inflation outlook.

Meanwhile, despite the increase in credit card and residential real estate loans in recent years, the results of this study indicate that the BSP policy measures on credit accumulation and consumer spending were able to help maintain the stability of the Philippine financial system in terms of better loan quality, improved credit environment and increased financial awareness of the household sector. These helped maintain the overall stability of the country's financial system during the recent global financial crisis.

Notwithstanding this, Philippine households' credit accumulation warrants further study since the uncertain pace of global economic recovery could weaken the sector's earning and debt-servicing capacity and, based on the OLS modeling results, could have significant impact on the overall stability of the financial system.

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CHAPTER 5

HOUSEHOLD INDEBTEDNESS AND ITS IMPLICATION TO FINANCIAL STABILITY IN TAIWAN

By

Huei-Jung Fang*

1. Introduction

The maintenance of financial stability is one of the government's most important tasks. Financial firms much more likely to induce systemic risk than non-financial firms because financial firms are typically highly interconnected with one another, highly leveraged, and tend to use short-term debt to finance their holdings of long-term, relatively illiquid assets.[1]

As clearly illustrated in the U.S. subprime mortgage crisis, where the problems in a relatively small portion of the home mortgage market triggered the most severe financial crisis in the United States since the Great Depression, the financial system is adversely affected by the weakness in the household sector's debt repayment. Given the importance of household indebtedness for financial stability, proper understanding and assessment of household indebtedness and its implications on financial stability are crucial.

In the past decades, the household sector has played an increasingly important role in the financial system in Taiwan. Household loans[2] extended by commercial banks as a percentage of total loans of the banking system have significantly

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1. See James Bullard, Christopher J. Neely, and David C. Wheelock (2009).

2. Here only comprises the loans extended to households.

risen to 46.57% as of August 2009 from 40.25% end-2001. At the same time, loans to private enterprises as a percentage of total loans have stagnated at 40% or so and loans to government agencies have decreased by 7.68%.

For policymakers, the concern is whether financial stability is affected by greater household indebtedness. This paper looks at Taiwan's household debt situation and develops two error-correction models for household debt and the non-performing loan (NPL) ratio of household loans, respectively, to understand and assess Taiwan's household indebtedness and implications to financial stability.

This paper is organised as follows. Section 2 describes an overview of household debt in Taiwan. Section 3 is a review of the literature. Sections 4 and 5 present and discuss the results of the estimated models of household debt and the NPL ratio of household loans, respectively. Section 6 discusses the results of the stress tests. Section 7 concludes the paper.

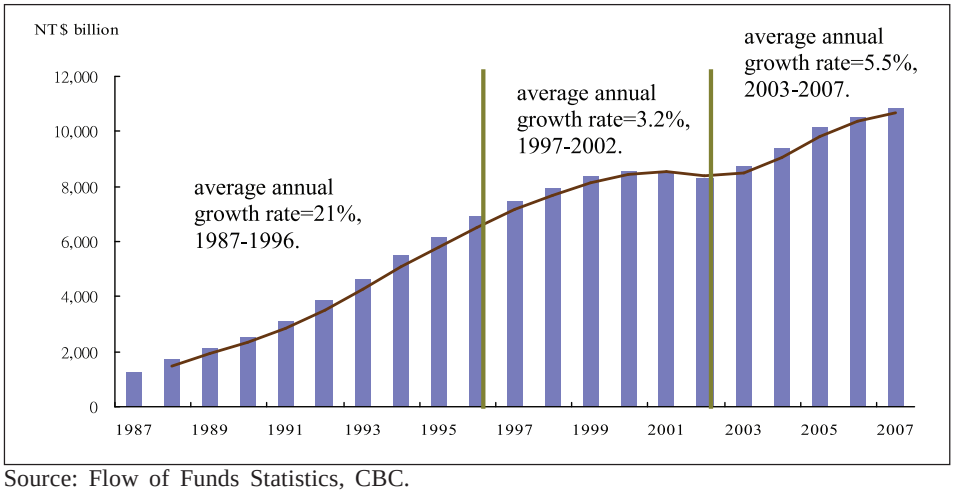
2. An Overview of Household Debt in Taiwan

2.1 Trend and Features of Household Debt in Taiwan

During the period from 1987 to 1996, household debt[3] in Taiwan increased rapidly, with an average annual growth rate of 21%. Afterward, this momentum slowed down as the housing market turned into a recession and banks' lending attitude became conservative due to a built-up of non-performing loans. Total household debt began a steady rise in 2003, due to falling interest rates, continuation of the government's preferential mortgage programmes, and active expansion of consumer finance activities by banks. As of end-2007, the outstanding household debt reached NT$10.81 trillion. Figure 1 displays the outstanding household debt between 1987 and 2007.

3. The household debt includes loans to households and non-profit institutions extended by financial institutions and non-financial institutions, excluding the accounts receivable or payable. The households here consist of individuals in general, including self-employed individuals, as well as individuals engaged in farming, forestry, fishing, animal husbandry and other sideline occupations. Non-profit institutions refer to those engaged in social welfare and cultural activities, such as charitable institutions, trade unions, private schools, and welfare institutions affiliated to various organisations.

Figure 1
Outstanding Household Debt



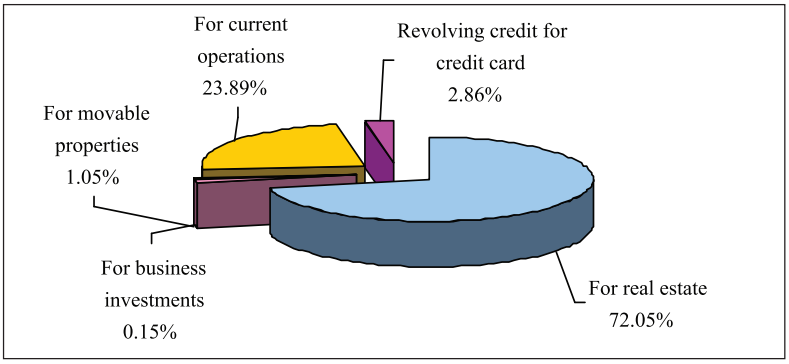
Source: Flow of Funds Statistics, CBC.

In Taiwan, banks finance more than 95% of household debt. The banks here refer to financial institutions that are allowed to extend loans to households, including commercial banks, community financial institutions, postal savings institutions, insurance companies, and investment and trust companies. Among them, commercial banks account for the majority of the financial sources of household debt.

For households, housing investment has been the major motive for borrowing. According to the monthly financial statistics, the single biggest share of household loans[4] extended by commercial banks in the second quarter of 2009 went to the purchase of real estate (72.05%), followed by working capital loans (23.89%) and revolving balances on credit cards (2.86%) (Figure 2).

4. Here only comprises the loans extended to households.

Figure 2
Household Loans in 2009 Q2 by Purpose

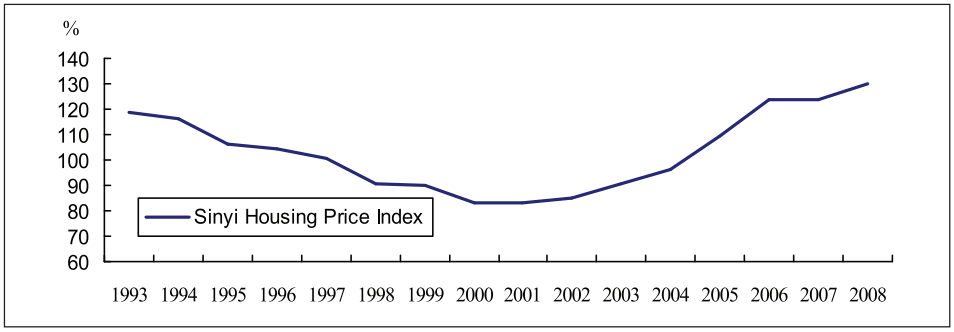


Source: Financial Statistics Montly, CBC.

2.2 Forces behind Household Debt and its Implications on Financial Stability

The movement of housing prices plays an important role in housing investment decisions. As depicted in Figure 3, housing prices began to decline gradually in 1994. During the period from 2000 to 2002, when the economy slowed down and the housing market also contracted due to the bursting of the I.T. bubble, the housing prices were at the lowest level. Then, between mid-2003 and 2008, due to the low interest rate environment and some measures[5] undertaken by Taiwan's government aiming at boosting the housing market, housing prices moved

Figure 3
Housing Prices*



* Sinyi Housing Price is released by Sinyi Realty Inc., showing the housing prices in the secondary market.
Source: Sinyi Realty Inc.

5. For example, the government provided interest subsidies enabling financial institutions to make preferential housing loans.

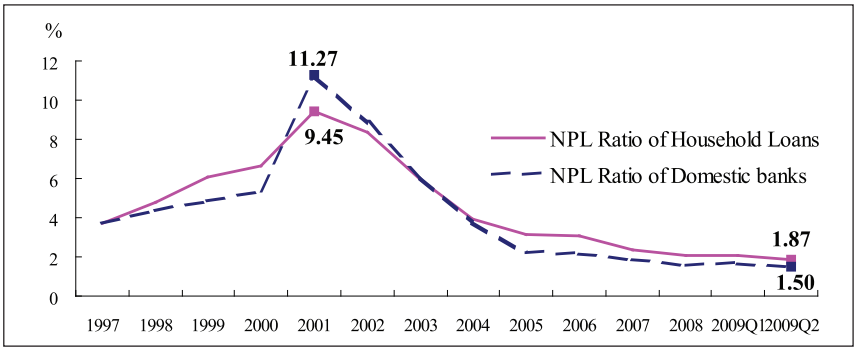
upward. When housing prices went up, expectations of further increase in housing prices encouraged households to purchase houses. Increases in the units and values of houses purchased accelerated the growth of housing debt. When housing prices went down, the growth of housing debt tended to decelerate.

In addition, the unemployment rate, disposable income and loan rate also have an effect on the household debt. The rise of unemployment rate would weaken the borrowers' ability of debt repayment, and the banks would in turn become conservative in lending. On the other hand, the increase of disposable income would strengthen the households' purchasing power and their debt servicing capacity. As for the loan rate, it reflects the borrowing cost. The rise of loan rate would affect the willingness to borrow.

Since the household loan is a major part of the banks' total loans, its quality is crucial to banks' performance and financial stability. Figure 4 shows the NPL ratio of household loans, which is defined as non-performing loans of households divided by total household loans. The ratio reflects the quality of the household loans.

In 1994, housing prices began to decline gradually. During the period from 2000 to 2002, the housing prices lingered at the lowest levels. In addition, the economy fell into recession in 2001, impacted by a bursting of the internet bubble in U.S. These factors resulted in the rising NPL ratio of household loans since

Figure 4
NPL Ratio of Household Loans[1] and Domestic Banks[2]



1. NPL ratio of household loans= non-performing household loans/household loans* 100.
2. Beginning Jan. 1993, the figures include the data of DBUs, OBUs and overseas branches of domestic banks and medium business banks, but exclude the data of Agricultural Bank of Taiwan. Beginning Dec. 2001, the figures represent the broadly defined NPL ratios released by Financial Supervisory Commission, which include loans under surveillance.

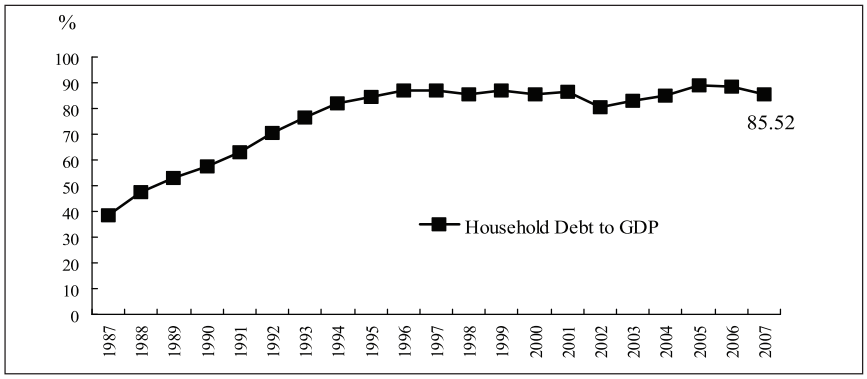
Source: Calculated by the author based on the Monthly Credit Statistics from the Joint Credit Information Center; Financial Statistics Monthly, CBC.

1994, with the NPL ratio reaching its peak at 9.45% in end-2001. As the housing market and the economy recovered from 2003, the NPL ratio of household loans declined and came down to its lowest level at 1.87% in the second quarter of 2009.

2.3 Facts about Household Debt in Taiwan

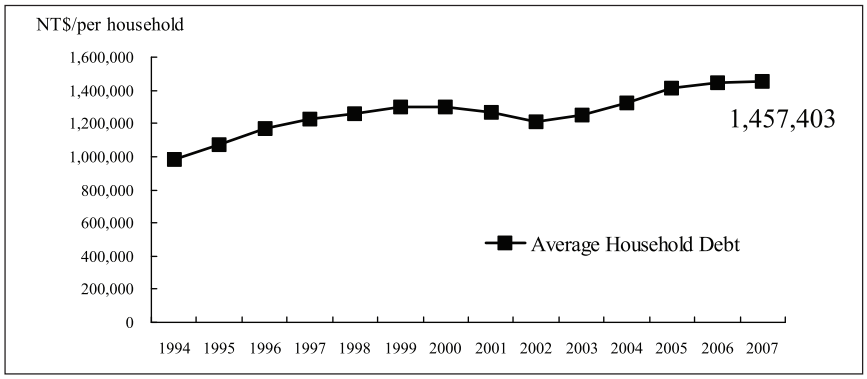
Between 1987 and 1994, the household debt to GDP ratio rose rapidly from about 40% in 1987 to 82.13% in 1994, as depicted in Figure 5. After 1995, the household debt to GDP ratio was stable between 80% and 90%. During the same time, the amount of the average household debt has risen at a modest pace. Figure 6 shows that the average household debt has increased modestly from NT$984,509 per household in 1994 to NT$1,457,403 per household in 2007, with an annual growth rate of 3.69%.

Figure 5: Household Debt to GDP Ratio



Sources: Flow of Funds Statistics, CBC; National Income in Taiwan, DGBAS.

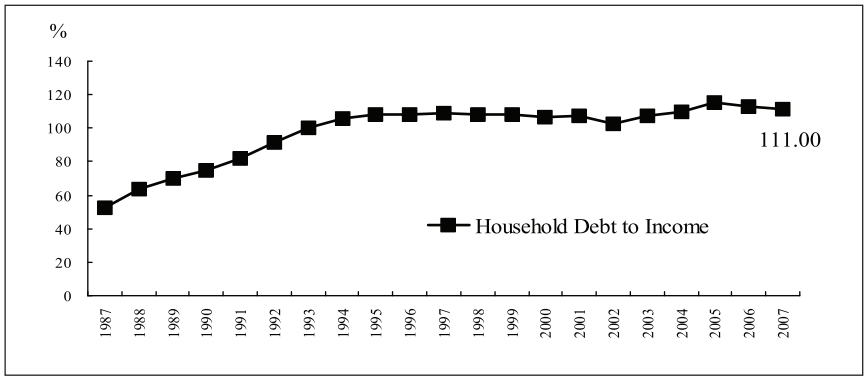
Figure 6: Average Household Debt



Sources: Flow of Funds Statistics, CBC; Family Income and Expenditure Survey, DGBAS.

As for household debt to income ratio (Figure 7), it rose rapidly from 52.51% in 1987 to more than 100% in 1993. Since 1993, the ratio has maintained stable. As of end-2007, it stood at 111%. Housing investment is the major purpose of the household borrowing in Taiwan. It is observed that Taiwan's household debt to income ratio is higher compared to those of other Asian economies. High household debt to income ratio is not necessarily a problem in itself as long as households have enough inflow of income to service their principal and interest payments.

Figure 7: Household Debt to Income Ratio

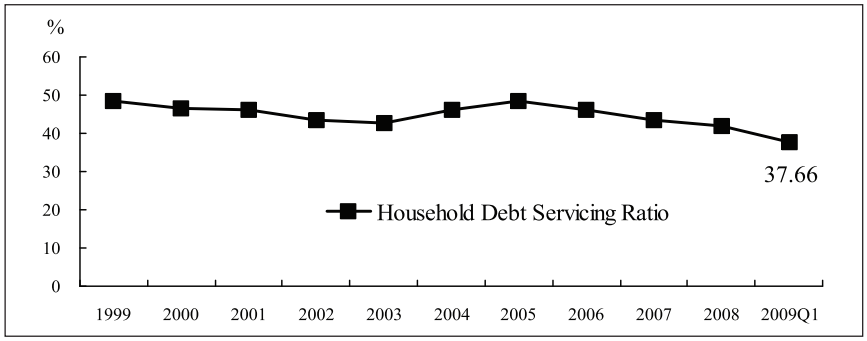


Sources: Flow of Funds Statistics, CBC; National Income in Taiwan.

Although household debt burden is heavy in Taiwan, the household debt servicing ratio, defined as the ratio of principal and interest payments to disposable income, has stayed below 50% since 1999, as depicted in Figure 8. This shows Taiwan's households have ample capacity to service their debt. In addition, the high household savings rate in Taiwan, which was 22.49%[6] at end-2007, provides a buffer against the heavy household debt burden.

6. This figure was sourced from the Family Income and Expenditure Survey, DGBAS.

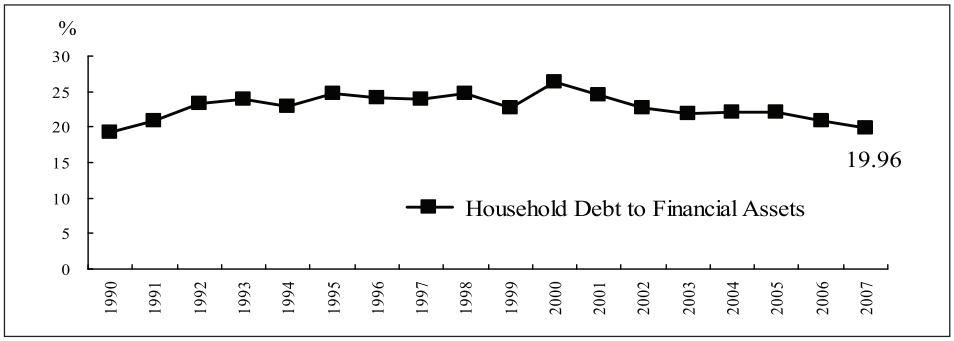
Figure 8: Household Debt Servicing Ratio*



* Debt Service Ratio=principle and interest payments/disposable income* 100
Note: Household debt servicing ratios in 2008 and 2009Q1 are CBC's estimates.
Sources: CBC, JCIC and DGBAS.

On the other hand, the household debt to financial assets ratio has maintained between 19% and 25% since 1990 and stood at 19.96% in 2007, as depicted in Figure 9. It shows the gearing ratio of the households in Taiwan is stable and acceptable, compared with the United States, in which the household debt to financial assets ratio has risen greatly from 21.06% in 2000 to 32.88% in 2008.

Figure 9: Household Debt to Financial Assets Ratio



Source: Flow of Funds Statistics, CBC.

3. Review of Literature

Yen Chrystal Shih and Chu-Ming Tsao (2004) made a study of the household debt in Taiwan. According to their paper, although household debt has been increasing in Taiwan in the past two decades as a result of a housing market boom, deregulation of bank entry, narrow profit margins in corporate finance, etc., it is not very excessive and its effect on the economy is by far moderate.

MasterCard (2007) published a paper entitled "Household Debt in Taiwan: An Analysis of the Consumer Debt Crisis." This paper stated there are reasons to believe that the outlook for household credit in Taiwan is generally positive: "The downturn in household credit is beginning to ease. As banks are mostly over the hump of managing down their credit card-related debts, this drag on household credit should reverse in 2007. In the longer term, a restructured banking sector will be able to support a more sustainable pace of household credit growth."

There are few papers developing models that link Taiwan's household debt to relevant macroeconomic variables usable by policymakers for scenario analysis and stress tests. In essence, this paper will construct two error-correction models for household debt and the NPL ratio of household loans, respectively, which are linked to relevant macroeconomic variables. In addition, given the importance of the real estate for financial stability, we conduct stress tests to assess the impact of a fall in real housing prices on the NPL ratio of household loans.

4. An Empirical Model of Household Debt

This section presents an estimated model of household debt. In Taiwan, banks finance more than 95% of household debt. We take the household loans extended by banks[7] to represent total household debt.

4.1 The Data

Our data set runs from Q1:1997 to Q2:2009, consisting of 50 quarterly observations. The data set contains the following variables: (1) real household debt, (2) real housing price, (3) housing stock, (4) loan rate, (5) unemployment rate, and (6) real disposable income. Appendix B provides the description and sources of each variable.

The loan rate and unemployment rate are monthly data. We convert the monthly data into the quarterly data by using three-month average as their quarterly data. The real disposable income, which is yearly data, is converted into quarterly data estimated by the quarterly GDP data. The rest of the variables are quarterly data.

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7. The banks here refer to financial institutions that are permitted to extend loans to households, including commercial banks, community financial institutions, postal savings institutions, insurance companies, and investment and trust companies. Among them, commercial banks account for the majority of the financial sources of household debt.

4.2 Results of the Empirical Study

4.2.1 Unit Root Tests

As Philips (1988) demonstrated, any Ordinary Least Square (OLS) regression that is based on the levels of the time series variables is spurious. We first examine the stationarity of each stochastic variable. Two standard tests for the stationary process, Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test, are applied to examine the null of the unit roots in each variable. In this paper, we use econometric software Eviews 5 to conduct the empirical analyses. All specifications exclude a trend with up to four lags.

Tables 1 and 2 report the ADF and PP unit root test results, respectively. Based on the results in Tables 1 and 2, the non-stationary null hypothesis for most of the level variables cannot be rejected. However, the first differences of all variables appear to be stationary with the rejection of the unit root hypotheses. We can conclude that the real household debt, real housing price, housing stock[8], real disposable income and unemployment rate are I(1), while the loan rate is I(1) or I(0).

8. ADF and PP test statistics with a constant term suggest that the housing stock is I(1), but ADF and PP test statistics without drift do not show such results.

Table 1
ADF Unit Root Test

Level	τ_μ	τ_τ	Difference	τ_μ	τ_τ
Log(Real household debt)	-1.59 (0.4807)	3.83 (0.9999)	D(Log(Real household debt))	-5.47*** (0.0000)	-4.68*** (0.0000)
Loan rate	-1.02 (0.7378)	-2.05** (0.0397)	D(Loan rate)	-3.38** (0.0166)	-2.83*** (0.0055)
Unemployment rate	-2.30 (0.1754)	0.65 (0.8530)	D(Unemployment rate)	-3.18** (0.0279)	-3.00*** (0.0036)
Log(Real disposable income)	-2.13 (0.2342)	0.33 (0.7755)	D(Log(Real disposable income))	-2.30 (0.1758)	-2.35** (0.0199)
Real housing price	-0.29 (0.9183)	0.64 (0.8520)	D(Real housing price)	-7.40*** (0.0000)	-7.41*** (0.0000)
Log(housing stock)	0.08 (0.9607)	3.48 (0.9998)	D(Log(housing stock))	-3.78*** (0.0056)	-1.16 (0.2213)

Notes: 1. τ_μ, Exogenous: Constant; τ_τ, Exogenous: None.
2. Numbers in parentheses are MacKinnon (1996) one-sided p-values.
3. *** indicates significant at 1%, ** significant at 5%, and * significant at 10%.
4. Lag Length: 4 (automatic selection based on Schwarz Information Criterion, MAXLAG=4).

Table 2
Philips-Perron Unit Root Test

Level	τ_μ	τ_τ	Difference	τ_μ	τ_τ
Log(Real household debt)	-1.44 (0.5571)	2.87 (0.9987)	D(Log(Real household debt))	-5.49*** (0.0000)	-4.75*** (0.0000)
Loan rate	-0.80 (0.8107)	-2.48** (0.0141)	D(Loan rate)	-3.33** (0.0190)	-2.81*** (0.0059)
Unemployment rate	-0.87 (0.7881)	0.98 (0.9107)	D(Unemployment rate)	-4.97*** (0.0002)	-4.84*** (0.0000)
Log(Real disposable income)	-3.05** (0.0374)	0.72 (0.8678)	D(Log(Real disposable income))	-14.45*** (0.0000)	-12.58*** (0.0000)
Real housing price	-0.03 (0.9508)	0.75 (0.8733)	D(Real housing price)	-7.42*** (0.0000)	-7.43*** (0.0000)
Log(housing stock)	0.10 (0.9626)	15.51 (1.0000)	D(Log(housing stock))	-3.75*** (0.0061)	-1.37 (0.1556)

Notes: 1. τ_μ, Exogenous: Constant; τ_τ, Exogenous: None.
2. Numbers in parentheses are MacKinnon (1996) one-sided p-values.
3. *** indicates significant at 1%, ** significant at 5%, and * significant at 10%.
4. Bandwidth: automatic selection (Newey-West using Bartlett Kernel spectral estimation method).

4.2.2 Cointegration Test

There are several econometric estimation procedures designed to deal with the unit root problem. In this paper, we follow Dag Henning Jacobsen and BjØrn E. Naug (2004) in using an error-correction model (ECM) specification. The use of ECM is also in line with other work on debt in arrears.

One advantage of the ECM specification is that it allows the estimation of both the short-term and long-run effects of explanatory time series variables. However, to yield meaningful estimates of the ECM, which avoids resulting in spurious regression in the ordinary least-squares estimation of the long-run regression, it is necessary to have the existence of a cointegrating relationship in the long-run regression.

To make sure if there is a cointegrating relationship in the long-run regression, where each variables is I(1) except the loan rate is I(1) or I(0), we conduct

Johansen Cointegration Test in this section. All specifications include the constant term without the trend. We set the long-run regression as the following:

$$\log(real\ household\ debt)_t = \beta_1 loan\ rate_t + \beta_2 unemployment\ rate_t + \beta_3 real\ housing\ price_t + \beta_4 \log(housing\ stock)_t + \varepsilon_t \quad (4.1)$$

where ε_t *is stationery error term.*

Table 3 reports the Johansen Cointegration Test results. Based on the results, the real household debt forms a cointegrating relationship with other variables in the long-run regression. In addition, according to the ADF and PP unit root test results, ε_t is I(0).

Table 3
Johansen Cointegration Test

Eigenvalue	Trace Statistic	λ_{max} Statistic	Trace Statistic 0.05 Critical Value	Hypothesized No. of CE(s)	λ_{max} Statistic 0.05 Critical Value	Hypothesized No. of CE(s)
0.513617	87.12108	34.59642	68.81889	r=0*	33.87687	r=0*
0.384891	52.52465	23.32585	47.85613	r≦1*	27.58434	r≦1
0.327817	29.19880	19.06680	29.79707	r≦2	21.13162	r≦2
0.147783	10.13200	7.675889	15.49471	r≦3	14.26460	r≦3
0.049882	2.456110	2.456110	3.841466	r≦4	3.841466	r≦4

*Significant at 5% level and the critical value is in the parentheses.
The *r* denotes the maximum number of cointegrating vectors.

4.2.3 Error-correction Model of Household Debt

Since we made sure the existence of a cointegrating relationship in the long-run regression, then the error-correction model of household debt can be set as the following:

$$\Delta\log(real\ household\ debt_t) = \alpha_1\Delta(unemployment\ rate_{t-4}) + \alpha_2\Delta(real\ housing\ price_t) + \alpha_3\Delta\log(housing\ stock_{t-4}) + \alpha_4\Delta\log(real\ disposable\ income_t) + \alpha_5 ecm_{t-1} \quad (4.2)$$

$$ecm_t = \log(real\ household\ debt_t) - [\beta_1 loan\ rate_t + \beta_2 unemployment\ rate_t + \beta_3 real\ housing\ price_t + \beta_4\log(housing\ stock_t)] \quad (4.3)$$

First of all, we employ the OLS estimation in the long-run regression (4.3). Next, the calculated residuals from the long-run regression are used as an additional explanatory variable, i.e. ecm_{t-1}, in the short-run equation (4.2). Finally, the OLS estimation is employed in the error-correction model of the real household debt. The results are shown in Box 1.

Box 1: Estimated Error-correction Model of Real Household Debt

Long-run estimation:

$$\log(real\ household\ debt_t) = \underset{(2.77)^{***}}{0.100926}*real\ housing\ price_t + \underset{(223.37)^{***}}{1.022239}*\log(housing\ stock_t) - \underset{(-4.17)^{***}}{3.217329}*unemployment\ rate_t - \underset{(-7.76)^{***}}{2.526375}*loan\ rate_t$$

Adjusted R^2=0.92

Short-run dynamic equation:

$$\Delta\log(real\ household\ debt_t) = \underset{(-2.46)^{**}}{-1.373048}\Delta(unemployment\ rate_{t-4}) + \underset{(2.43)^{**}}{0.067782}\Delta(real\ housing\ price_t) + \underset{(4.48)^{***}}{1.875030}\Delta\log(housing\ stock_{t-4}) + \underset{(2.04)^{**}}{0.045750}\Delta\log(real\ disposable\ income_t) - \underset{(-4.51)^{***}}{0.264887}ecm_{t-1}$$

$$ecm_t = \log(real\ household\ debt_t) - \left[0.100926*real\ housing\ price_t + 1.022239*\log(housing\ stock_t) - 3.217329*unemployment\ rate_t - 2.526375*loan\ rate_t\right]$$

Adjusted R^2=0.40 S.E. of regression=0.009

Note: Number of observation = 45 after adjustments (Q2:1998 - Q2:2009)
t-statistics are in parentheses.
***, **, * denote significance at 1%, 5%, and 10%, respectively.

We first look at the long-run estimation results (the first equation in Box 1). The unemployment rate and loan rate have a negative effect on real household debt, but the rest of the variables have a positive effect. A one-hundred basis points increase in unemployment rate and loan rate leads to about a 3.2% and 2.5% decrease in real household debt, respectively. The rise of unemployment rate would weaken the borrowers' ability to repay debts so that they would borrow less money and the banks would, on that concern, become conservative in lending. On the other hand, the rise of loan rate would hamper the willingness to borrow.

In Taiwan, housing investment has been the major motive for household borrowing. Therefore, Taiwan's housing market booms usually are accompanied by rising household debt. The model also confirms that higher housing price will

contribute to household debt increase. Besides, housing stock has a positive effect on household debt as well.

The second equation in Box 1 is the short-run dynamic equation. The explanatory variables include the first differences of unemployment rate, real housing price, the log of housing stock, the log of the real disposable income and ECM term. Quarterly movement in real household debt varies positively with quarterly changes of real housing price, the log of housing stock (4 quarters lag), and the log of real disposable income, but varies negatively with quarterly changes of unemployment rate (4 quarters lag) and ECM term (1 quarter lag).

5. An Empirical Model of the NPL Ratio of Household Loans

This section presents an estimated model of the NPL ratio of household loans in Taiwan, drawing on the study by Don Nakornthab and Chirada Na Suwan (2006) on Thailand's agricultural household debt. The theoretical set-up of their model, which we also adopt here, is a life-cycle model with a default option developed by Lawrence (1995). In this class of model, the probability of default, which we associate in this paper with the NPL ratio of household loans, can be derived as a function of the loan borrowed to the real GDP[9], income (net of other expenses), wealth, borrowing rate, and the state of the economy. The probability of a borrower defaulting increases with real debt to real GDP, borrowing rate, and the poor state of the economy, but decreases with net income, wealth, and the good state of the economy.

5.1 The Data

Our data set runs from Q1:1997 to Q2:2009, consisting of 50 quarterly observations. The data set contains the following variables: (1) NPL ratio of household loans, (2) the ratio of real household debt to real GDP, (3) real housing price, (4) unemployment rate, and (5) loan rate. Appendix C provides the description and sources of each variable.

These variables are based on the implications of the theoretical model. The NPL ratio of household loans is intended to be a proxy of the probability of default. The real housing price is intended to capture wealth. The unemployment rate is not only a proxy of the state of the economy, but also reflects the households' real purchasing power. The interpretation of the rest of the variables is straightforward.

9. This variable is a measure of the relative development of the financial and real sides of the economy.

The unemployment rate and loan rate are monthly data. We convert the monthly data into the quarterly data by using three-month averages as their quarterly data. The rest of the variables are quarterly data.

5.2 Results of the Empirical Study

5.2.1 Unit Root Tests

We first examine the stationarity of each stochastic variable. Two standard tests for the stationary process, ADF and PP tests, are applied to examine the null of the unit roots in each variable. All specifications exclude the constant term and the trend with up to four lags.

Tables 4 and 5 report the ADF and PP unit root test results, respectively. Based on the results in Tables 4 and 5, the non-stationary null hypothesis for most of the level variables, except the loan rate, cannot be rejected. However, the first differences of all variables appear to be stationary with the rejection of the unit root hypotheses. In other words, we can find all of the level series, except the loan rate, are non-stationary and all the five first difference variable series appear I(0). Therefore, we can conclude that the NPL ratio of household loans, the ratio of real household debt to real GDP, real housing price, and unemployment rate are I(1), while loan rate is I(0).

Table 4
ADF Unit Root Tests

Level	τ	Difference	τ
NPL ratio	-1.11	D(NPL ratio)	-2.16**
	(0.2376)		(0.0311)
Loan rate	-2.05**	D(Loan rate)	-2.83***
	(0.0397)		(0.0055)
Unemployment rate	0.65	D(Unemployment rate)	-3.00***
	(0.8530)		(0.0036)
Real household debt	-0.47	D(Real household debt to	-4.21***
to Real GDP	(0.5068)	Real GDP)	(0.0001)
Real housing price	0.64	D(Real housing price)	-7.41***
	(0.8520)		(0.0000)

Notes: 1. τ , Exogenous: None.
2. Numbers in parentheses are MacKinnon (1996) one-sided p-values.
3. *** indicates significant at 1%, ** significant at 5%, and * significant at 10%.
4. Lag Length: 4 (automatic selection based on Schwarz Information Criterion, MAXLAG=4).

Table 5
Philips-Perron Unit Root Tests

Level	τ	Difference	τ
NPL ratio	-0.67	D(NPL ratio)	-4.41***
	(0.4197)		(0.0000)
Loan rate	-2.48**	D(Loan rate)	-2.81***
	(0.0141)		(0.0059)
Unemployment rate	0.98	D(Unemployment rate)	-4.84***
	(0.9107)		(0.0000)
Real household debt	-0.45	D(Real household debt to	-7.78***
to Real GDP	(0.5147)	Real GDP)	(0.0000)
Real housing price	0.75	D(Real housing price)	-7.43***
	(0.8733)		(0.0000)

Notes: 1. τ , Exogenous: None.
2. Numbers in parentheses are MacKinnon (1996) one-sided p-values.
3. *** indicates significant at 1%, ** significant at 5%, and * significant at 10%.
4. Bandwidth: automatic selection (Newey-West using Bartlett Kernel spectral estimation method).

5.2.2 Cointegration Test

We follow Don Nakornthab and Chirada Na Suwan (2006) in using an error- correction model (ECM) specification. It is necessary to have the existence of a cointegrating relationship in the long-run regression.

To make sure if there is a cointegrating relationship in the long-run regression, in which each variables is I(1) except the loan rate is I(0), we adopt Johansen Cointegration Test in this section. All specifications include a constant term without a trend. We set the long-run regression as the following:

$$NPL_t = \beta_1 loan\ rate_t + \beta_2 unemployment\ rate_t + \beta_3 real\ household\ debt\ to\ real\ GDP_t + \beta_3 real\ housing\ price_t + \varepsilon_t \quad (5.1)$$

where ε_t *is stationary error term.*

Table 6 reports the Johansen Cointegration Test results. Based on the results, the NPL ratio of household loans forms a cointegrating relationship with other variables in the long-run regression. In addition, according to the ADF and PP unit root test results, ε_t is I(0).

Table 6
Johansen Cointegration Test

Eigenvalue	Trace Statistic	λ_{max} Statistic	Trace Statistic 0.05 Critical Value	Hypothesized No. of CE(s)	λ_{max} Statistic 0.05 Critical Value	Hypothesized No. of CE(s)
0.613219	93.91146	45.59509	69.81889	r=0*	33.87687	r=0*
0.399041	48.31636	24.44299	47.85613	r≦1*	27.58434	r≦1
0.244751	23.87338	13.47394	29.79707	r≦2	21.13162	r≦2
0.184061	10.39943	9.763963	15.49471	r≦3	14.26460	r≦3
0.013152	0.635470	0.635470	3.841466	r≦4	3.41466	r≦4

*Significant at 5% level and the critical value is in the parentheses.
The *r* denotes the maximum number of cointegrating vectors.

5.2.3 Error-correction Model of the NPL Ratio of Household Loans

Since we are sure of the existence of a cointegrating relationship in the long-run regression, the error-correction model of the NPL ratio of household loans can be set as the following:

$$\Delta(NPL_t) = \alpha_1\Delta(loan\ rate_{t-3}) + \alpha_2\Delta(unemployment\ rate_{t-4}) + \alpha_3\Delta(real\ household\ debt\ to\ real\ GDP_t) + \alpha_4\Delta(real\ housing\ price_t) + \alpha_5 ecm_{t-1} \quad (5.2)$$

$$ecm_t = NPL_t - [\beta_1 loan\ rate_t + \beta_2 unemployment\ rate_t + \beta_3 real\ household\ debt\ to\ real\ GDP_t + \beta_4 real\ housing\ price_t] \quad (5.3)$$

First of all, we employ the OLS estimation in the long-run regression (5.3). Next, the calculated residuals from the long-run regression are used as an additional explanatory variable, i.e. ecm_{t-1}, in the short-run equation (5.2). Finally, the OLS estimation is employed in the error-correction model of the NPL ratio of household loans. The results are shown in Box 2.

Box 2

Estimated Error-correction Model of NPL Ratio of Household Loans

Long-run estimation:

$$NPL_t = \underset{(3.54)^{***}}{0.522431}*loan\ rate_t + \underset{(6.79)^{***}}{1.829505}*unemployment\ rate_t - \underset{(-7.15)^{***}}{0.088928}*real\ housing\ price_t + \underset{(1.82)^{*}}{0.057182}*real\ household\ debt\ to\ real\ GDP_t$$

Adjusted R^2=0.79

Short-run dynamic equation:

$$\Delta(NPL_t) = \underset{(2.20)^{**}}{0.684444}*\Delta(loan\ rate_{t-3}) + \underset{(3.15)^{***}}{0.993308}*\Delta(unemployment\ rate_{t-4}) - \underset{(-0.81)}{0.011035}*\Delta(real\ housing\ price_t) + \underset{(2.15)^{**}}{0.054108}*\Delta(real\ household\ debt\ to\ real\ GDP_t) - \underset{(-1.77)^{*}}{0.128929}*ecm_{t-1}$$

$$ecm_t = NPL_t - \left[0.522431*loan\ rate_t + 1.829505*unemployment\ rate_t - 0.088928*real\ housing\ price_t + 0.057182*real\ household\ debt\ to\ real\ GDP_t\right]$$

Adjusted R^2=0.20 S.E. of regression=0.004

Note: Number of observation = 45 after adjustments (1998Q2 - 2009Q2)
t-statistics are in parentheses.
***, **, * denote significance at 1%, 5%, and 10%, respectively.

Looking at the long-run estimation results first (the first equation in Box 2). The level of real housing price index has a negative effect on the NPL ratio of household loans, while the rest of the variables have a positive effect. A one unit increase in real housing price leads to about a 9 basis points decrease in the NPL ratio of household loans. Higher housing price may result in higher final wealth and better borrowing conditions, and therefore the probability of falling into arrears is lower.

Notice that we employ the variable of real household debt to real GDP in the model instead of real household debt and real GDP respectively. To fit the model better, we combine the two variables into one as a ratio of real household debt divided by real GDP. In terms of the economy view, the ratio of real household debt to real GDP is a measure of the relative development of the financial and real sides of the economy.

Looking back on the long-run regression, the ratio of real household debt to real GDP has a positive effect on the NPL ratio of household loans, reflecting a threat to financial stability if the expansion on the financial side is faster than the one on the real side in the economic system. In fact, overly rapid expansion of banks' loans will tend to impair asset quality and thus cause the NPL ratio to soar. The model shows that a one-hundred basis points increase in the ratio of real household debt to real GDP leads to about a 6 basis points increase in the NPL ratio of household loans.

The other two variables, loan rate and unemployment rate, also have a positive effect on the NPL ratio of household loans. An increase of the loan rate would raise the interest payment pressures for borrowers. Besides, higher unemployment rate reflects not only weak purchasing power of the households, but also a poor state of the economy. All of these factors would increase the chance of defaults. The model shows that a one-hundred basis points increase in loan rate and unemployment rate leads to 52 basis points and 183 basis points increases in the NPL ratio of household loans, respectively.

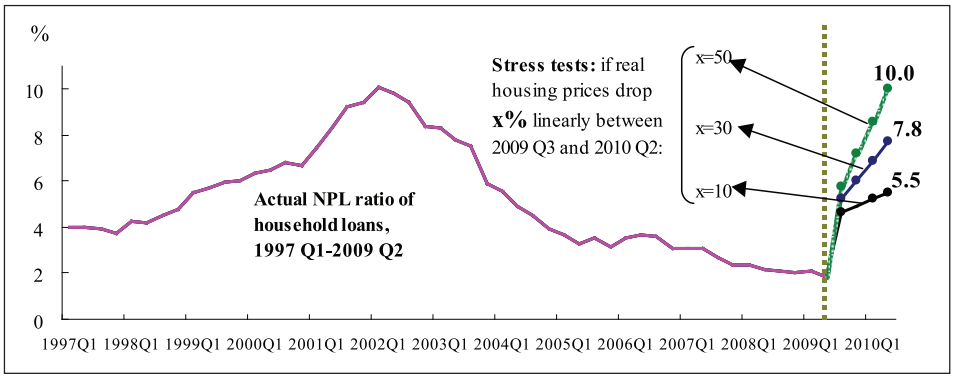
The second equation in Box 2 is the short-run dynamic equation. The explanatory variables include the first differences of loan rate, unemployment rate, real housing price, and real household debt to real GDP ratio and ECM term. Quarterly movement in the NPL ratio of household loans varies positively with quarterly changes of loan rate (3 quarters lag), unemployment rate (4 quarters lag), and real household debt to real GDP, but varies negatively with quarterly changes of real housing price and ECM term (1 quarter lag).

6. Stress Tests and Policy Implications

Since housing loans represent a dominant portion of household loans and around 40% of bank loans is mortgage on real estate, banks are usually exposed to cycles and volatility in the housing market, potentially impacting financial stability. Therefore, it is necessary for us to conduct stress tests to assess the impact of a fall in real housing prices on the NPL ratio of household loans.

Figure 10 traces out the forecasts of the NPL ratio of household loans from Q3: 2009 to Q2:2010 under three different scenarios in real housing prices which are assumed to drop linearly by 10%, 30%, and 50% between Q3:2009 and Q2:2010, respectively. In all the tests, all the variables, except for real housing price and real household debt to real GDP, are assumed to remain at the actual Q2:2009 levels.

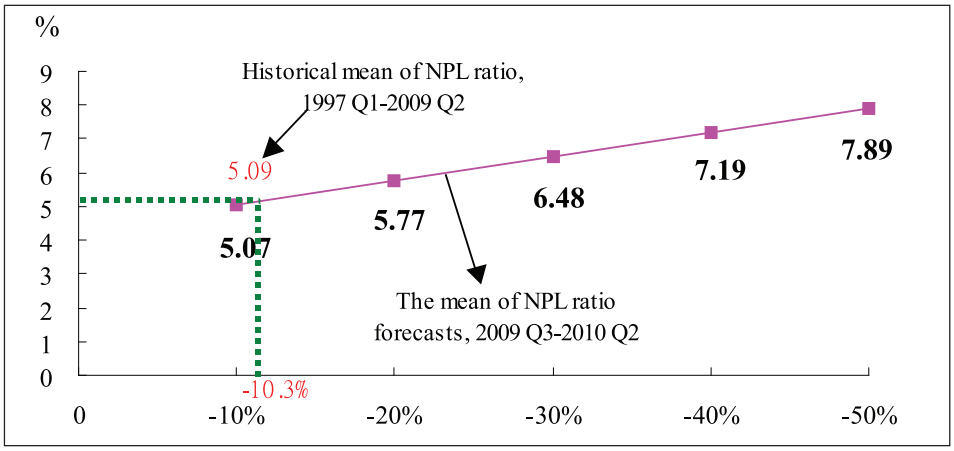
Figure 10: Stress Tests of NPL Ratio of Household Loans



Sources: Calculated by the author based on the Monthly Credit Statistics from the Joint Credit Information Center.

Figure 11 shows the mean of the forecasts of the NPL ratio of household loans from Q3:2009 to Q2:2010 under different scenarios in real housing prices. We find the mean of the forecasts of the NPL ratio from Q3:2009 to Q2:2010 will be higher than the historical mean of the NPL ratio from Q1:1997 to Q2:2009 when the real housing prices drop linearly by larger than 10.3% between Q3:2009 and Q2:2010.

Figure 11
The Mean of NPL Ratio Forecasts under Different Stress Tests



Taiwan's unemployment rate has moved gradually higher since the second half of 2008 due to the global financial crisis. The average unemployment rate reached a high level of 5.84% in the second quarter of 2009. Due to the assumption of the high unemployment rate in the stress tests, the forecasts of the NPL ratio of household loans are higher under the different declines of the real housing price.

Under the high unemployment rate environment, the slumped housing market would cause significant pressure on the financial stability. It is, therefore, necessary for the government to monitor the development of the housing market and take timely and appropriate measures in response to potential adverse impact of houses prices on the financial system to maintain financial stability.

For example, impacted by the global financial crisis, the growth momentum of the housing market slowed perceptibly in the second half of 2008. For the purpose of financial stability, Taiwan's government provided the following policy tools aiming at boosting the housing market:

(1) On September 22, 2008, the government provided interest subsidies enabling financial institutions to make NT$200 billion (US$5.88 billion) available in preferential housing loans.

(2) On February 16, 2009, the government announced that young families with some qualifications could apply for preferential housing loans of up to NT$2 million with a zero interest rate for the first two years.

(3) On April 14, 2009, an additional amount of NT$200 billion in preferential housing loans was provided.

(4) Continuation of provision of interest subsidies for home-purchase and home-refurbishment loans.

(5) The government provided rent subsidies for those without the means to purchase a home.

7. Conclusion

In Taiwan, housing investment has been the major motive for household borrowing. The single biggest share of household loans extended by commercial banks in the second quarter of 2009 was for the purchase of real estate (72.1%). The movement of housing prices plays an important role in housing investment decisions. Therefore, the housing price has a great effect on household debt, which is consistent with the results of our model. A one unit increase in real housing price leads to about a 0.1% increase in real household debt.

Furthermore, our model of household debt also shows that a 1% increase in housing stock leads to about a 1.0% increase in real household debt respectively, but a one-hundred basis points increase in unemployment rate and loan rate leads to about a 3.2% and 2.5% decrease in it, respectively.

The quality of household loans is quite crucial to the banks' assets and financial stability. The household loans in Taiwan make up the largest portion of loans extended by commercial banks, which as a percentage of total loans of the banking system is 46.6% as of August 2009. For policymakers, the concern is whether financial stability is affected by greater household indebtedness. In this paper, we associate the NPL ratio of household loans with the probability of defaulting on household debt. Higher NPL ratio of household loans is harmful to financial stability.

Our model of NPL ratio of household loans shows that the NPL ratio of household loans increases with the real household debt to real GDP ratio, loan rate, and unemployment rate, but decreases with the housing price. A one-hundred basis points increase in the real household debt to real GDP ratio, loan rate, and unemployment rate leads to about a 6 basis points, 52 basis points and 183 basis points increase in the NPL ratio of household loans, respectively, but a one unit increase in real housing price leads to about a 9 basis points decrease in it.

Based on the implications of the model of NPL ratio of household loans, the ratio of real household debt to real GDP has a positive effect on the NPL ratio of household loans, reflecting that if the expansion on the financial side is faster than the one on the real side in the economic system, it would threaten financial stability. In fact, overly rapid expansion of banks' loans will tend to impair asset quality and thus cause the NPL ratio to soar.

Since the housing loans represent a dominant portion of household loans, it is necessary for us to conduct stress tests to assess the impact of a fall in real housing prices on the NPL ratio of household loans. According to the results of our stress tests, we find the mean of the forecasts of the NPL ratio from Q3:2009 to Q2:2010 will be higher than the historical mean of the NPL ratio from Q1:1997 to Q2:2009 if the real housing prices drop linearly by larger than 10.3% between Q3:2009 and Q2:2010. It shows that the downward trend of the real housing price has severe impact on the NPL ratio of household loans under the higher unemployment rate environment.

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Appendix A

Sources of Household Debt

In Taiwan, several databanks provide household data. The Central Bank of the Republic of China (Taiwan) (CBC) has data on financial position, financial assets and financial debt of the household sector, which are part of the flow of funds statistics. The Directorate-General of Budget, Accounting and Statistics (DGBAS) Survey on National Wealth has data on real assets of households. It's Family Income and Expenditure Survey includes data on households' interest payments and disposable income. The Joint Credit Information Center (JCIC), supervised by the CBC and Ministry of Finance (MOF), collects data on credit information from member financial institutions, and nationwide credit information from this databank is shared by members only.

Appendix B

Description of the Variables in Model of Household Debt

Variables	Description	Sources
Real household debt	1. Real household debt: The household loan deflated by headline CPI. 2. The household loan: The household outstanding loans and credit card revolving balances from financial institutions. The financial institutions include depository institutions and other financial institutions (trust and investment companies, life insurance companies, securities finance companies, and securities firms).	Flow of Funds Statistics, Central Bank of the Republic of China (Taiwan) (CBC).
Real housing price	1. Sinyi housing price index which represents the secondary housing prices. 2. Real housing price: Sinyi realty housing price index deflated by headline CPI.	Sinyi Realty Inc.
Housing stock	Units of housing stock.	Housing Statistics, Construction and Planning Agency, Ministry of the Interior.
Loan rate	Weighted average interest rates on new loans by five leading banks.	Financial Statistics Monthly, CBC.
Unemployment rate	Official unemployment rate.	DGBAS.
Real disposable income	1. Real disposable income: Disposable income deflated by headline CPI. 2. Disposable income = Household income - Direct taxes - Transfer payment.	National Income in Taiwan, DGBAS.

Appendix C

Description of the Variables in Model of the NPL Ratio of Household Loans

Variables	Description	Sources
NPL ratio of household loans	1. Non-performing loans: (1) "Non-performing loans" before 30 June 2005 include the following items: • Loans for which repayment of principal has been overdue for more than three months. • Medium- and long-term loans for which installment repayments are overdue for more than 6 months. • Any loan for which the debtor has been sued for non-payment or the underlying collateral has been disposed of. • Any loan for which repayment of interest has been overdue for more than six months. (2) "Non-performing loans" after 1 July 2005 include the following items, according to the "Regulations Governing the Procedures for Banking Institutions to Evaluate Assets and Deal with Non-performing / Non-accrual Loans," which were issued by the Ministry of Finance on 6 January 2004 and entered into force on 1 July 2005: • Loans for which repayment of principal or interest has been overdue for more than three months. Any loan for which the principal debtors and surety have been sued for non-payment or the underlying collateral has been disposed of, although the repayment of principal or interest has not been overdue for more than three months. 2. NPL ratio of household loans = Non-performing household loans/ Household loans.	Calculated by the authors based on the Monthly Credit Statistics from the Joint Credit Information Centre.
The ratio of the real household debt to real GDP	1. The real household debt: The household loans deflated by headline CPI. 2. The ratio of the real household debt to real GDP = The real household loans/ Real GDP.	Financial Statistics Monthly, CBC; National Income in Taiwan, DGBAS.
Real housing price	1. Sinyi housing price index which represents the secondary housing prices. 2. Real housing price: Sinyi realty housing price index deflated by headline CPI.	Sinyi Realty Inc.
Real disposable income	1. Real disposable income: Disposable income deflated by headline CPI. 2. Disposable income = Household income - Direct taxes - Transfer payment.	National Income in Taiwan, DGBAS.
Unemployment rate	Official unemployment rate.	DGBAS.
Loan rate	Weighted average interest rates on new loans by five leading banks.	Financial Statistics Monthly, CBC.

CHAPTER 6

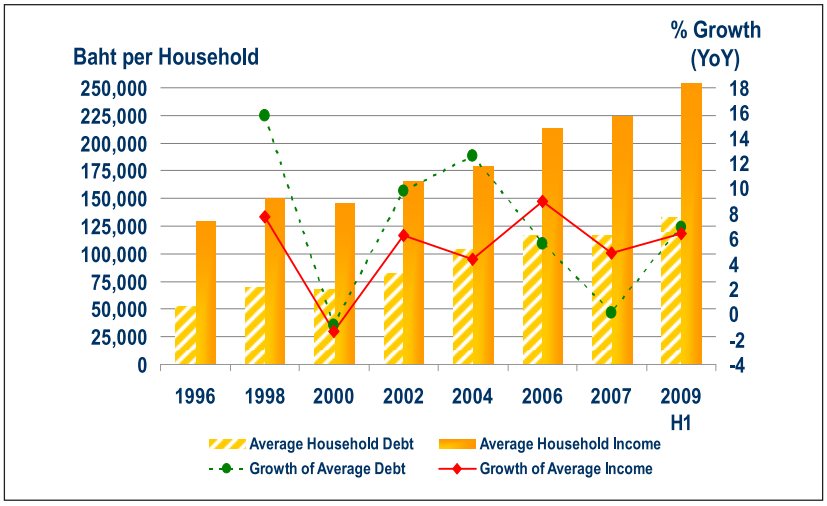
HOUSEHOLD INDEBTEDNESS AND ITS IMPLICATIONS FOR FINANCIAL STABILITY IN THAILAND

By

Siriporn Siripanyawat, Wanvimol Sawangngoenyuang
and Pimporn Thungkasemvathana[1]

1. Introduction

Figure 1
Thailand Average Household Debt and Income



Source: NSO Socio-Economic Survey 1996-2009 H1, authors' calculation

Should we be concerned about the rising level of household debt in relation to the Thai financial stability? This was the issue widely discussed after the 1997 financial crisis when Thailand's average household debt grew at an unforeseen level. Past studies, however, showed that Thailand household indebtedness has not created problems in terms of financial or macroeconomic

1. Authors are Senior Economist of the Northern Region Office; Researcher of the Monetary Policy Group; and Economist of the Monetary Policy Group of the Bank of Thailand respectively.

stabilities. Moreover, the socioeconomic survey (SES)[2] revealed that the growth rate of Thai household debt began to decelerate since 2004 and the trend continued well into 2007 (Figure 1).

However, in response to the world financial crisis in 2007-2008, concerns about household indebtedness emerged once again to the forefront. In fact, the most recent household data of the first half of 2009 revealed that the average household debt has escalated and begun to grow slightly faster than the income (Figure 1). It is therefore, necessary for policymakers to revisit the issue in order to understand its implications for the financial stability.

1.1 Financial Stability Perspective

Unlike developed economies where household loan constitutes a major part of the total loan portfolio, in Thailand, consumer loan accounts for about one-fourth of the overall private loan. Hence, the focus of Thailand financial stability has always been placed on corporate loan rather than consumer loan.

Nevertheless, lessons learned from the developed world, especially from the subprime crisis, reiterate that there is a possibility that excessive household debt may emerge as a problem once the Thai financial sector becomes more mature, i.e. when financial institutions increasingly expand their customer base to the household sector. For instance, household's inability to service debt may translate into non-performing loans (NPLs) that deteriorate the banks' balance sheet. In response, the growth rate of household debt, household balance sheet and quality of the loans as reflected by household NPLs and delinquency rates are some of the key variables that the Bank of Thailand (BOT) closely watch. In fact, at the BOT, the household sector is listed as one of the seven financial imbalances[3] monitored on a regular basis.

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2. Acronyms:

BAAC	Bank for Agriculture & Agricultural Cooperatives
BOT	Bank of Thailand
GHB	Government Housing Bank
GSB	Government Saving Bank
SES	Socio-Economic Survey conducted by National Statistical Office
SFI	Special Financial Institutions (such as BAAC, GHB, and GSB)

3. The seven financial imbalances observed by BOT comprise the external sector, non-financial corporate sector, government sector, household sector, financial market, real estate sector, and financial institutions.

As a central bank, the BOT is concerned with such questions as:

- What determine the level of household debt? Is household loan sensitive to changing macroeconomic variables?

- How do NPLs response to rising or falling of household debt? Are financial institutions vulnerable to economic shock and rising household debt?

2. Literature Review

Figure 2
Summary of the Literature Review

	Household Survey (Econometric Model of Household Stress)	Household Balance Sheet Approach	Aggregate Data from Formal Sources (Stress Test on Financial Sector)
Title/ Authors	Rising Thai Household Debts: Assessing Risks and Policy Implications Thaicharoen, Ariyapruchya, and Chucherd (2004)	- The Wealth and Debt of Thai Households: Risk Management and Financial Access Ariyapruchya, Sinswat, and Chutchotitham (2007) -Household Sector and monetary policy implications: Thailand recent experience Subhanij (2008)	Thailand's Agricultural Household Debt: Assessment of Recent Trends Nakornthab and Na suwan (2006)
Data Methods	-Used data from Socio-Economic Survey (SES) and BoT's Household Attitude toward Debt and Saving (HADS) Survey -Ordered logit model, stress test on household sector	- Used data from a joint project BOT&NSO 2006Q4 -Constructed and gauged Thai household balance sheet	- Used data from the Bank for Agriculture and Agricultural Cooperatives to develop an estimated factor model of loans in arrears of Thai agricultural households - Error Correction Model
Main Findings	- High growth rate of household credits was unlikely to pose serious problem to the financial stability - Small pockets of the population are vulnerable to interest rate, income shocks and debt increases	Household balance sheets are, in general, strong and that financial access augments household resiliency in the face of shocks.	A fall in real farm price would have a negative impact on agricultural households by lowering their capacity to service debt which would in turn hurt BAAC's loan book.

The BOT launched a number of studies over the past 5-6 years in order to identify trends of Thailand household indebtedness. By and large, three approaches have been observed.

The first approach relied on the data from the household surveys. Thaicharoen, Ariyapruchya, and Chucherd (2004) applied the life-cycle model of household borrowing and the permanent income model to Thailand's

experience with rising household debt. The authors found that Thailand's low inflation, income growth and demographic change had contributed to rising household debt.

The authors then attempted to assess the household's ability to service debt using aggregate level macro prudential analysis and international comparison of variables, such as debt to disposable income, household debt to GDP ratio and debt service ratio. Meanwhile, at the disaggregated level, the author used an ordered logit model to estimate the relationship between household debt, income, other socio-economic characteristics and past exposure to shocks to obtain the conditions under which households are most likely to face stress from indebtedness. The authors found that small pockets of the population are vulnerable to interest rate, income shocks and debt increases, namely, those with low education, low income, high debt-to-income ratios, high share of floating-rate loans, and those who work as farm operators, laborers, or entrepreneurs.

The second group of papers holds a view that household debt cannot be analysed in absence of household asset as the asset can be used to pay off debt or debt can sometimes be used to accumulate asset. An examination of household balance sheet, then, can quickly provide a rough idea of whether a household is excessively indebted and whether it holds sufficient assets to buffer against shocks. Therefore, this group of studies attempted to construct household balance sheet.

Upon the availability of the household financial asset data obtained from a special survey conducted as a joint project between the BOT and the NSO, Ariyapruchya, Sinswat, and Chutchotitham (2007) constructed and gauged the Thai household balance sheet and concluded that household balance sheets are, in general, strong and that financial access augments household resiliency in the face of shocks. Specifically, in Q4:2006 household assets exceed household debt by a multiple of at least seven, implying that by and large, Thai households remained solvent. Subhanij (2009) added that in terms of types of household asset holdings, residential and commercial real estate accounted for more than two thirds of the total assets in Thailand and accounted for about 30% of household debt in 2006. The large share of real estate in the asset and debt portfolios of Thai household, therefore, indicates that households are likely to be quite vulnerable to volatility in house prices.

The third group of studies, on the other hand, relies on aggregate data from formal sources of loans, i.e. from commercial banks to conduct stress test on the financial sector.

While the aforementioned studies focused on household stress, Nakornthab and Na Suwan (2007) used data from the formal source of the loan, specifically, the Bank for Agriculture and Agricultural Cooperatives (BAAC) to develop an estimated factor model of loans in arrears of Thai agricultural households that can be used for scenario analysis. Using an Error-correction Model (ECM) specification, the authors found that a fall in real farm price would have a negative impact on agricultural households by lowering their capacity to service debt which would in turn hurt BAAC's loan book.

For the most part, the previous studies indicate that the Thai household indebtedness is, at the moment, unlikely to pose any serious problem to the financial stability. However, down to the micro level, different groups of population may experience different level of financial stress. Moreover, different household groups may be vulnerable to different type of economic shocks. For example, those who possess high amounts of housing loan may be vulnerable to interest rate shocks as well as house price shocks. Meanwhile, agricultural households' ability to finance household debt may decline following a fall in real farm price.

Based on the previous studies, additional contributions of this paper will be as followed:

1. To identify the most up-to-date trends of Thailand household indebtedness using data obtained from two sources: household survey and consumer loan.

2. To identify potential forces behind the rise of household indebtedness and a model for consumer loan.

3. To assess the vulnerability of commercial banks by identifying a model for consumer NPL ratio that can be used for scenario analysis.

4. To identify policy implications.

3. Facts about Household Debt in Thailand

3.1 Data

3.1.1 Socio-Economic Survey (SES)

The Socio-Economic Survey is a household survey conducted by the National Statistical Office (NSO). It collects information on household income, expenditures, debt, and household characteristics, covering country-wide samples.

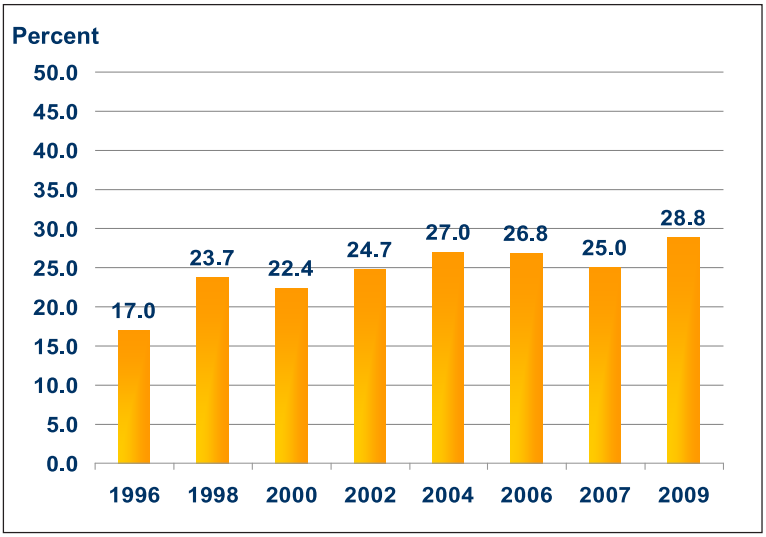
Since 1986, the survey had been conducted every other year, except after the 1997 crisis to 2002 where it was conducted on the annual basis but with a substantially smaller number of household samples in the odd year. Since 2006, there have been some changes in the form of the survey. Specifically, there are 2 sets of questionnaire: (1) Questionnaire of household member and expenditure and (2) Questionnaire of household income and debt. Although, the survey has been conducted every year since 2006, questions regarding household debt are only asked in the odd years. The most recent data that we have on household debt is from the year H1:2009.

*3.1.2 **Data from the Formal Sources of Household Loans** – combined by the BOT*

These are series of quarterly consumer loan and NPL ratio obtained from the financial institutions such as commercial banks, SFIs, credit fonciers, and other financial companies. However, the lengths of the time series data differed by types of financial institution.

3.1.3 Demand Side Perspective (Survey Data)

Figure 3
Total Thai Household Debt to GDP



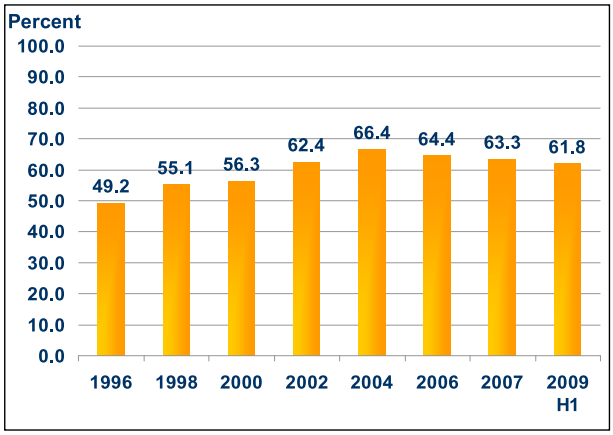
Source: NSO Socio-Economic Survey 1996-2009 H1, NESDB, authors' calculation

The SES data revealed that after the 1997 financial crisis, the aggregate household debt rose from about 17.0% of GDP in 1996 to 27.0% in 2004, but has gradually fallen since then. It is however, expected that in 2009, the household debt to GDP ratio will rise to approximately 28.8% due to the contracting GDP as a result of the world financial crisis in conjunction with the accelerated household debt.

The rise in the aggregate household debt can be attributable to the increase in the *number* of indebted household and/or the rise in the *amount* of debt per household.

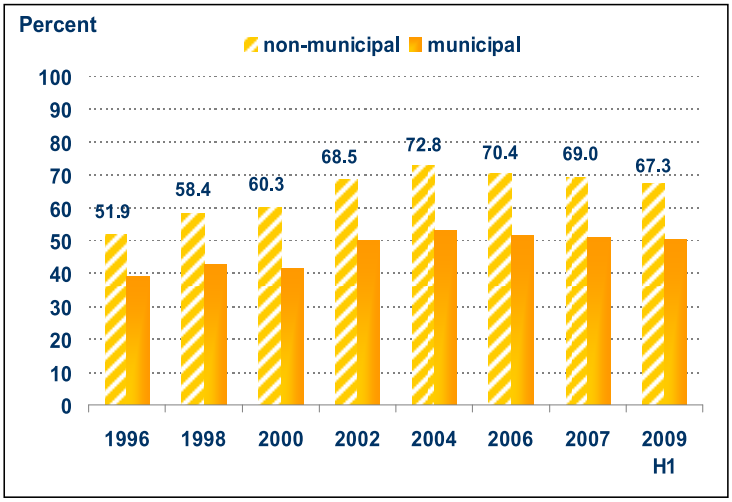
Aggregate HH Debt = Average Amount of Debt per HH * Number of Indebted HHs

Figure 4
Thai Household Debt Frequency
(number of indebted HHs to total HHs)



Source: NSO Socio-Economic Survey 1996-2009 H1

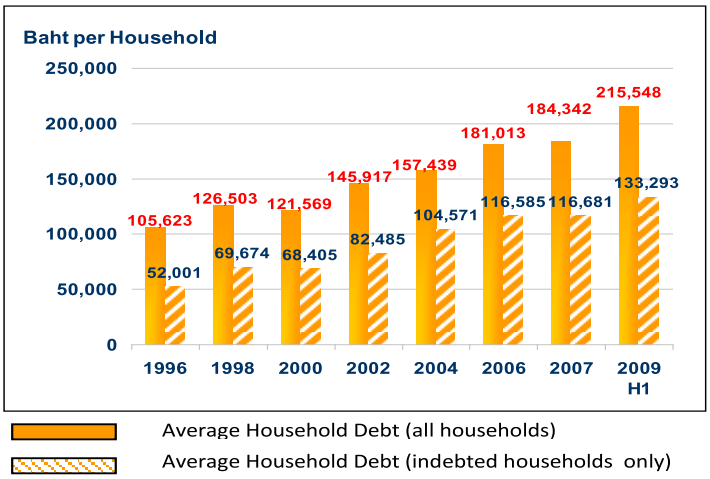
Figure 5
Distribution of Household Debt Frequency by Municipal Area



Source: NSO Socio-Economic Survey 1996-2009 H1, authors' calculation

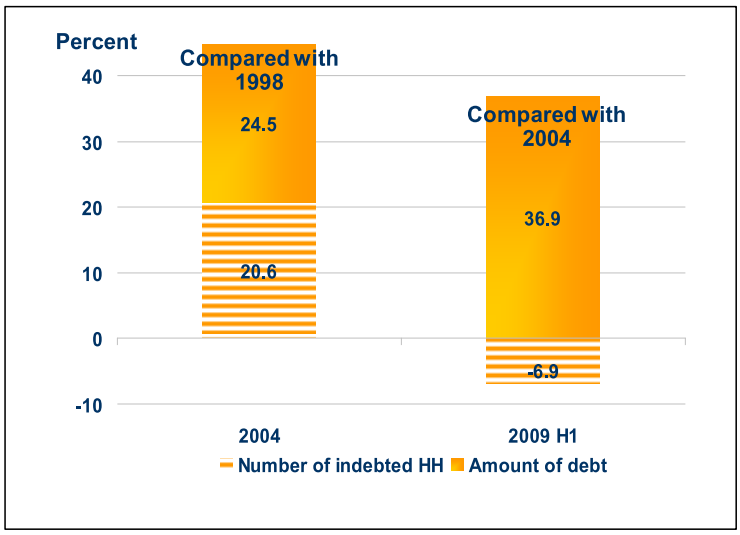
Figure 4 considers the number of indebted households as a percentage of total households (debt frequency). It shows that the number of indebted households increased from 49.2% of the total households in 1996 to 66.4% in 2004, but fell slightly to 61.8% in H1:2009. It was conjectured that the rise in the debt frequency during 2000 to 2004 reflected greater financial access, especially among households in the rural area, after the introduction of the village fund scheme by the government in 2002. This was evident in a surge in the number of indebted household in the non-municipal area from 60.3% in 2000 to 72.8% in 2004 (Figure 5).

Figure 6
Average Household Debt
(Total HHs VS Indebted HHs Only)



Source: NSO Socio-Economic Survey 1996-2009 H1

Figure 7
Growth: Number of Indebted HHs VS Amount of Debt per HH



Source: NSO Socio-Economic Survey 1996-2009 H1, authors' calculation

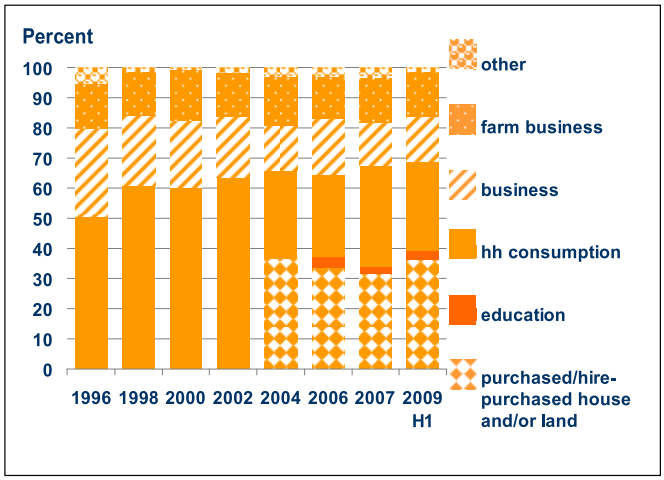
On the other hand, when considering the amount of debt per household, the SES data revealed that the average Thai household debt more than doubled from 52,001 baht in 1996 to 133,293 baht per household in H1:2009. When looking solely at indebted households, however, it was found that each indebted household had an average debt of as high as 215,548 baht.

From Figure 7, we can see that the rise in the *number of indebted households* and the rise in the *amount of household debt* were equally responsible for the rise in the aggregate household debt during the period between 1998 and 2004. Nevertheless, during 2004 to H1:2009, the augment in the average amount of debt per household was the main driver. In other words, those that already borrowed decided to borrow more. This could be explained in part by a period of low interest rates, rising consumer confidence and attractive loan offerings (Thaicharoen, Ariyapruchya, & Chucherd, 2004). This also implied that each household may be facing with increasing debt burden.

3.2 Purposes of Household Debt

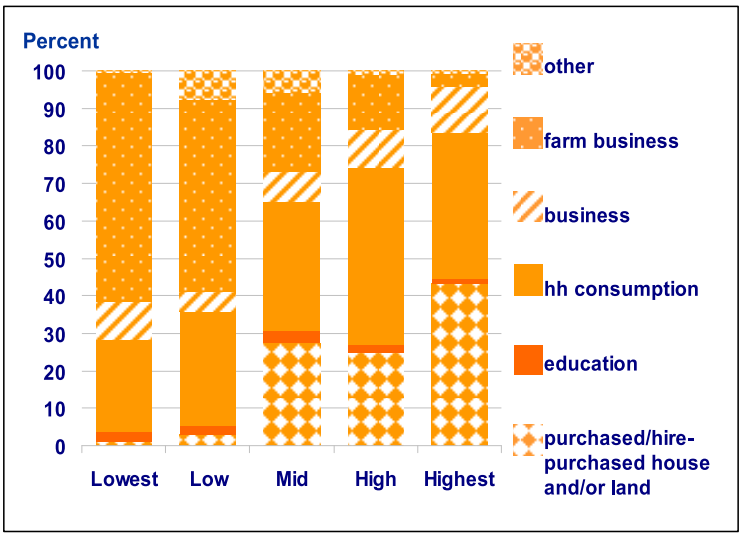
As to why households borrow, according to the SES data, about 36.3% of the household loan was for purchases of house or land while another 29.7% was for household consumption (Figure 8). This may imply that changes in house prices and mortgage loan rate may greatly affect the financial condition of Thai households.

Figure 8
Purposes of Household Debt



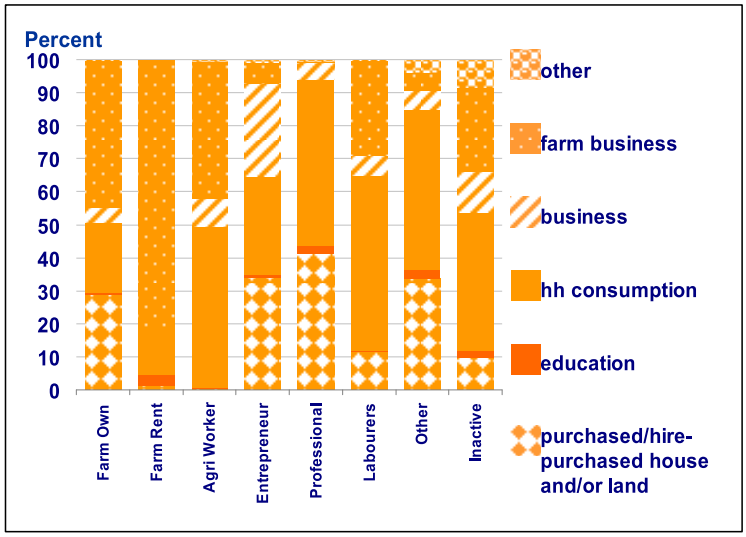
Source: NSO Socio-Economic Survey 1996-2009 H1, authors' calculation
Note: Since 2004 the data on purchased house and/or land has been split from household consumption

Figure 9
Purposes of Household Debt by Income Group



Source: NSO Socio-Economic Survey 2009 H1, authors' calculation

Figure 10
Purposes of Household Debt by Occupational Group



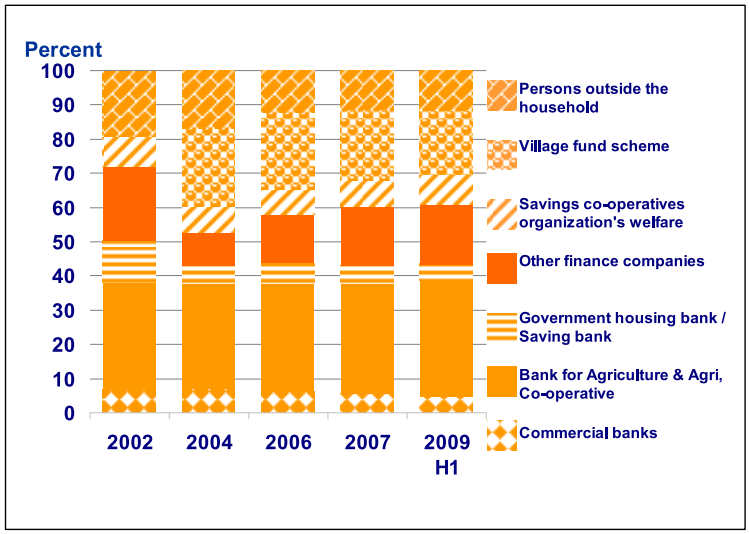
Source: NSO Socio-Economic Survey 2009 H1, authors' calculation

The purpose of the loans may differ by household characteristics such as income and occupation. As we can see from Figure 9, households in the highest income group allocated a considerable amount of household loan for the accumulation of asset, notably for purchase or hire-purchase of housing and/or land, whereas households in the lowest income group acquired loans for conducting farm businesses. Meanwhile, on the basis of occupation, Figure 10 shows that the professional group mainly borrowed for acquiring housing or land and for household consumption, while agricultural households tended to conduct farm business related loans.

3.2.1 Sources of Household Debt

Where do households obtain their loans? The first source is the formal source which consists of formal financial institutions with clear legal status. These are commercial banks, specialised financial institutions (SFIs), such as the Government Housing Bank (GHB), Bank for Agriculture & Agricultural Cooperatives (BAAC), and Government Saving Bank (GSB), saving co-operatives and village funds. The last group is the informal group which consists of institutions that have no legal status and are not supervised by the Thai authorities; borrowing from someone outside the household is one example.

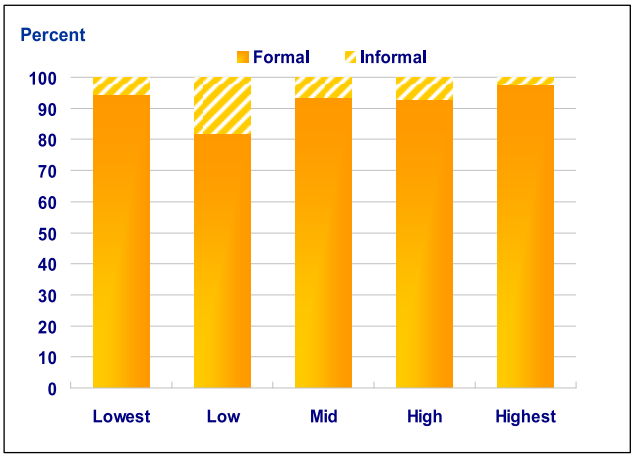
Figure 11
Sources of Household Debt (Number of HH)



Note: no data on village fund in 2002
Source: NSO Socio-Economic Survey 2002-2009 H1, authors' calculation

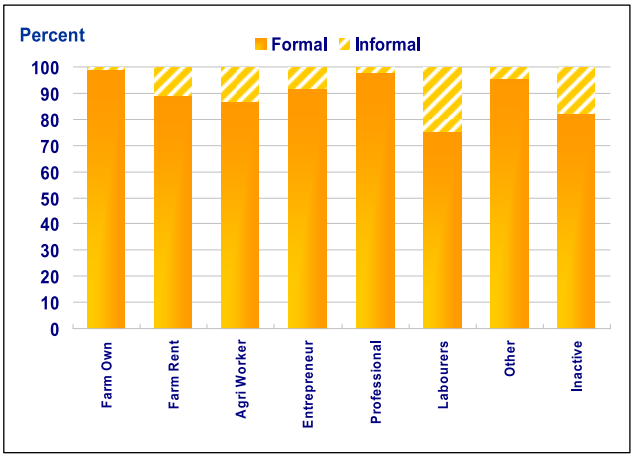
Figure 11 shows that the majority of Thai households borrow from formal credit source. From the survey conducted in H1:2009, the proportion of loans was 95% and 5% for formal and informal sources, respectively, as compared to 81% and 19% in 2002. The reduction in informal loans may correspond with the introduction of the village fund scheme in 2002.

Figure 12
Formal VS Informal Sources of HH Debt by Income (Size of Loans)



Source: NSO Socio-Economic Survey 2009 H1, authors' calculation

Figure 13
Formal VS Informal Sources of HH Debt by Occupation (Size of Loans)



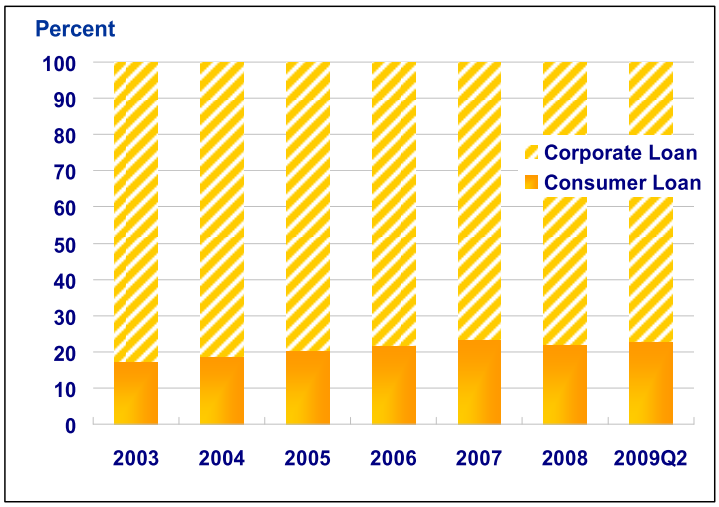
Source: NSO Socio-Economic Survey 2009 H1, authors' calculation

Further analysis based on the cross-section examinations of the SES data shows that some groups of households were more dependent on non-formal credit sources than the others. Figure 12 shows that in terms of the amount of loan, low income households relied more on the informal sources than high income households did. Meanwhile, Figure 13 shows that the laborer group relied more on the informal sources of loan than any other occupation.

3.3 Supply Side Perspective (Data from Formal Sources of Loans)

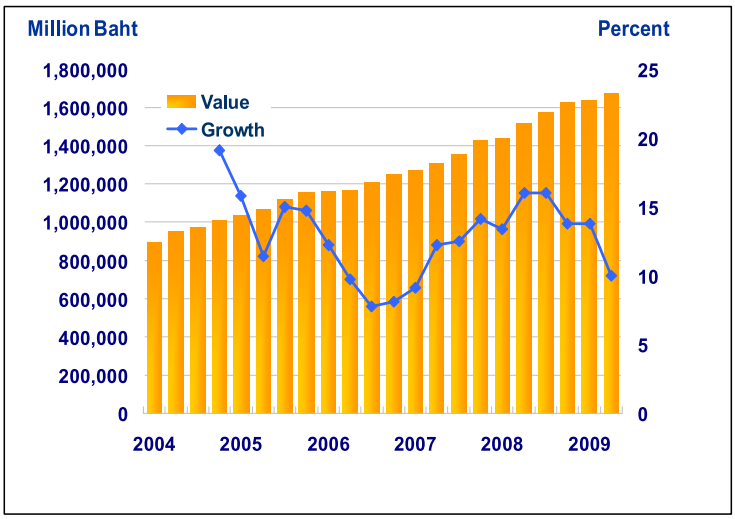
To complete the picture of Thailand household indebtedness, we also consider consumer loan extended by different types of financial institution: Thai and foreign commercial banks, credit fonciers, finance companies, and the SFIs.

Figure 14
Loan Portfolio
(Excluding SFI)



Source: BOT–Comprised of Thai CBs, Foreign CBs, Credit Fonciers, Finance Companies

Figure 15
Consumer Loan Outstanding Value & Growth
(Excluding SFI)

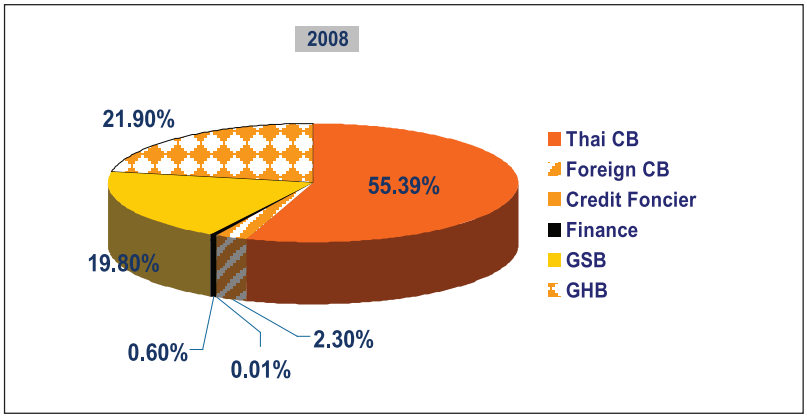


Source: BOT, authors' calculation
Comprised of Thai CBs, Foreign CBs, Credit Fonciers, Finance Companies

To begin with, we consider the total loan portfolio of these financial institutions as a whole (excluding SFIs due to the lack of time series data). Figure 14 shows that consumer loan constitutes about one fourth of the entire loan portfolio. In terms of sizes of loans, Figure 15 shows that, although the total outstanding value of consumer loan doubled within the last five years, the growth rate has decelerated during the political unrest in 2006 and the global economic downturn in 2008-2009. This may suggest that households became more cautious with spending and/or financial institutions tightened their credit requirements during such period clouded with uncertainties.

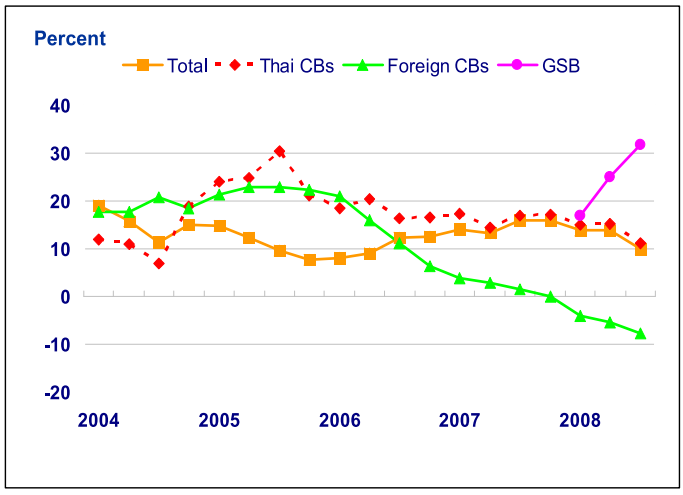
3.3.1 Providers of Consumer Loan

Figure 16
Share of Consumer Loan by Types of Financial Institution



Source: BOT, authors' calculation

Figure 17
Growth of Consumer Loan by Types of Financial Institution



Source: BOT, authors' calculation

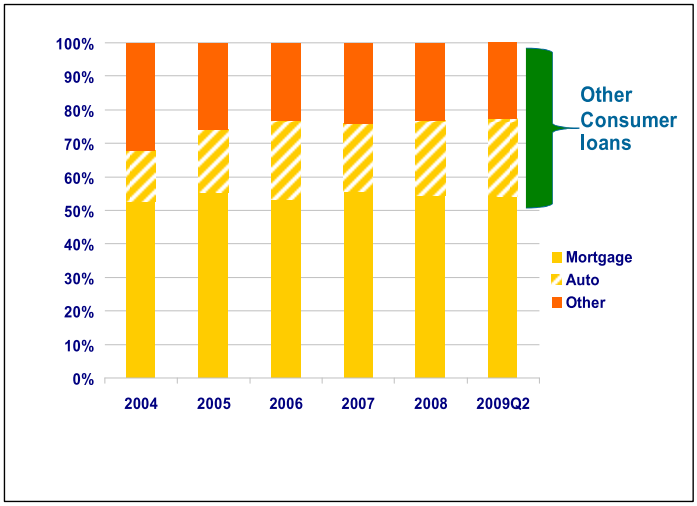
Figure 16 shows that commercial banks dominate the market for consumer loan in terms of volume, even though it has a smaller share in terms of the number of households using the service as reflected from the survey data (Figure 11). However, the SFIs, namely, the GSB and the GHB, also play important roles in the household credit market, accounting for about 41.7% of the total

consumer loan in 2008. Meanwhile, the role of foreign banks is still limited and largely focused on credit cards and personal loans. Figure 17 shows that the growth rates of consumer loan for most types of financial institution have decelerated over the past few years, especially after the financial crisis in 2007. GSB is one exception as the government has encouraged the SFIs to help provide liquidity for SMEs and households during the time of economic crisis.

3.3.2 Composition of Consumer Loan

In general, consumer loan can be broken down into two major categories: mortgage loan and other consumer loan. Figure 18 shows that mortgage loan dominates the household credit market, accounting for more than 50% of the total consumer loan. Other consumer loan comprises such loans as auto loan, credit card loan, education and travel loan.

Figure 18
Consumer Loan Portfolio (Excluding SFIs)



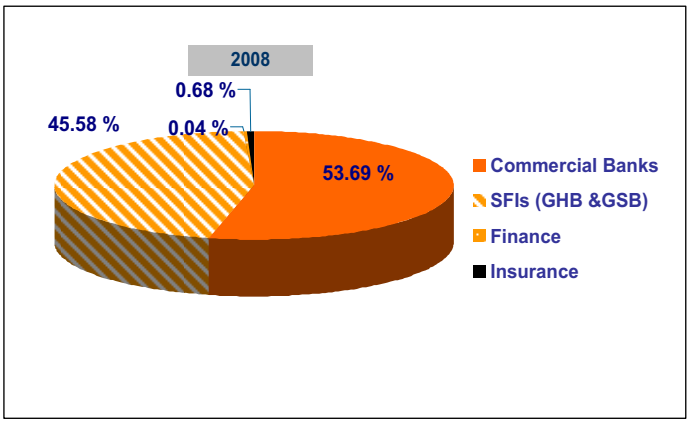
Source: BOT, authors' Calculation
Comprised of Thai CBs, Foreign CBs, Credit Fonciers, Finance Companies

As an attempt to understand household indebtedness from the supply-side perspective, we consider each type of consumer loan separately.

3.3.2.1 Mortgages

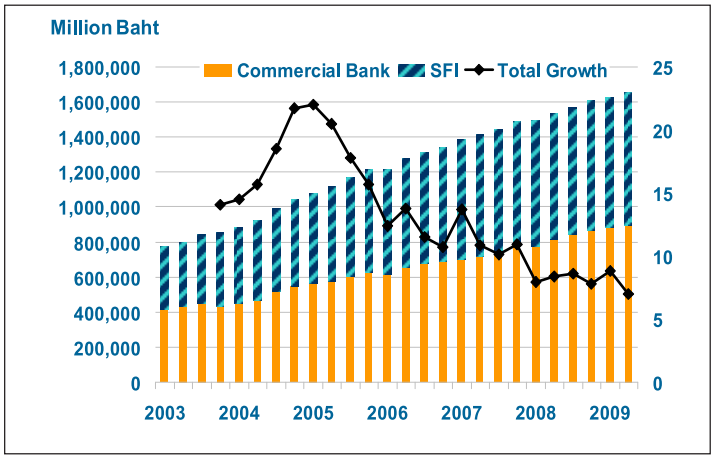
Mortgage is the most important loan in the consumer loan portfolio in terms of volume. For financial institutions, mortgage loan is considered relatively less risky as compared to other types of consumer loan due to required collaterals. Moreover, mortgage loan has lower risk weight when compared to other types of loan (reduced to 35% under Basel II), which suggests that commercial banks have lower cost of setting aside the required amount of capital.

Figure 19
Share of Mortgage Loan by Types of Financial Institutions



Source: BOT, authors' calculation

Figure 20
Outstanding Values and Growths of Mortgage Loan



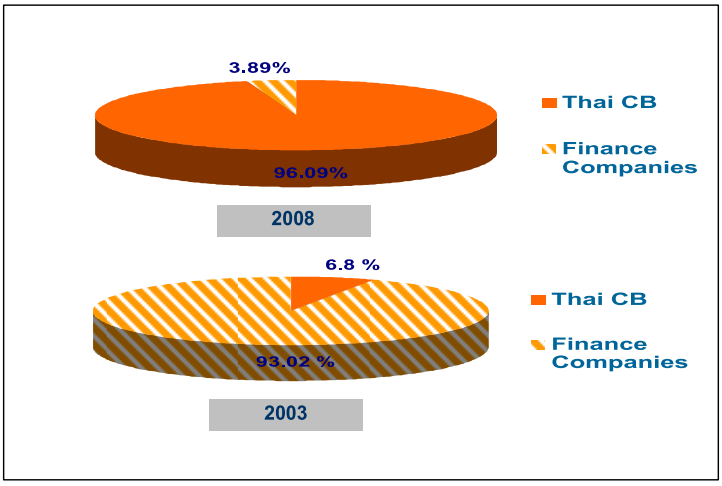
Source: BOT, authors' calculation

Figure 19 shows that Thai commercial banks dominate the mortgage loan market, accounting for over 50% of the total mortgage loan. However, the SFIs have also gained a substantial market share. As illustrated by Figure 20, during the past five years, mortgage loan has more than doubled. However, the growth rate of mortgage loan has decelerated over the years. The slow growth in housing loan could partially be explained by falling house prices (as will be discussed in the next section) as well as by the rising concerns over political instability and economic uncertainties.

3.3.2.2 Auto Loan

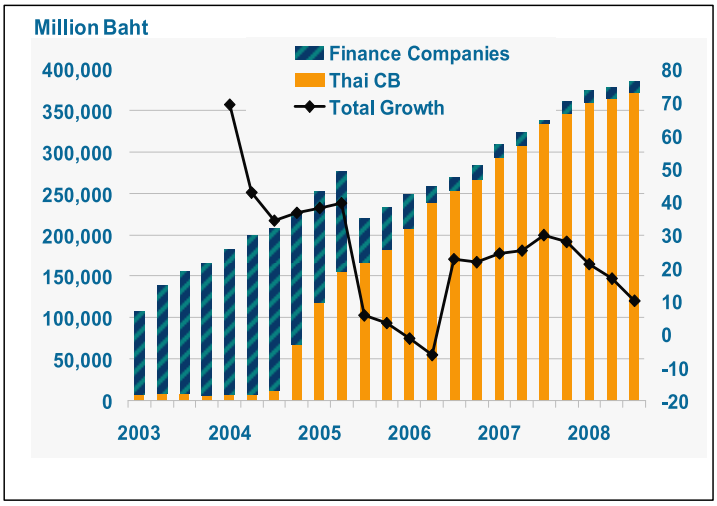
Auto loan occupies about 23% of the total consumer loan. Figure 21 shows that during the past 5 years the auto loan market has changed considerably. Before 2003, the auto loan market was dominated by finance companies that specialised in leasing business. However, in 2003, the BOT granted permission for commercial banks to offer auto loan to households, causing an immediate auto loan hike of 70% in 2004. Since then, it seems that commercial banks have taken over the market share over the years (Figure 22).

Figure 21
Share of Auto Loan by Types of Financial Institutions



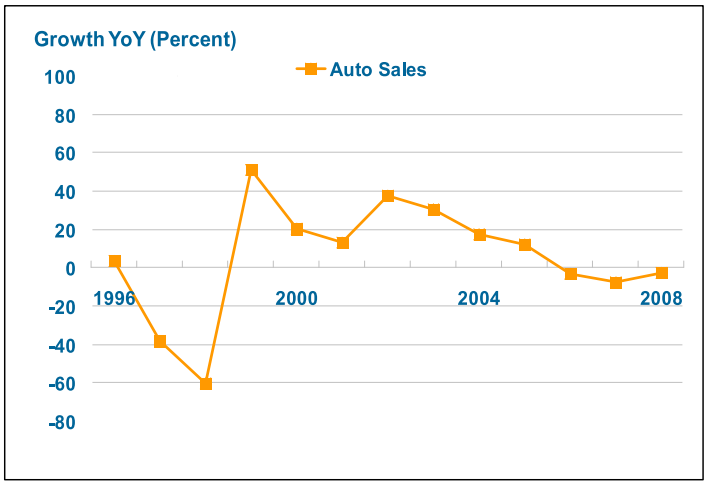
Source: BOT, authors' calculation

Figure 22
Outstanding Values and Growth of Auto Loan



Source: BOT, authors' calculation

Figure 23
Auto Sales Growth



Source: BOT

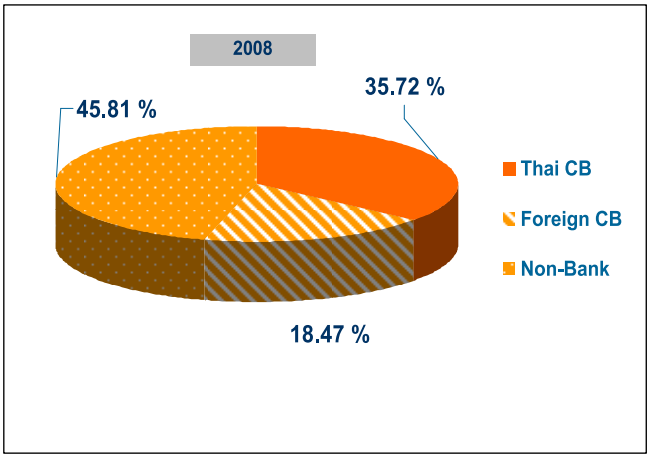
In general, the growth of auto loan depends on factors that influence consumption of new cars, for instance, gas prices, consumer confidence, and economic condition. During the past few years, Thailand has been confronted with manifold uncertainties such as political unrest, oil price hike, as well as the economic downturn, which have dampened consumer confidence considerably.

In turn, auto sales dropped (Figure 23), in line with the decelerated growth of auto loan.

3.3.2.3 Credit Card Loan

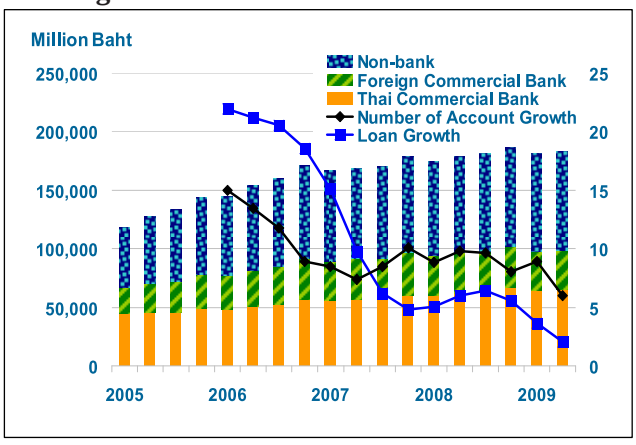
Another type of consumer loan worth mentioning is the credit card loan. In general, credit card loan is classified under *other consumer loan*. However, when considered individually, the credit card loan constitutes about 12% of all consumer loans.

Figure 24
Share of Credit Card Loans by Types of Financial Institutions



Source: BOT, authors' calculation

Figure 25
Outstanding Values and Growth of Credit Card Loans



Source: BOT, authors' calculation

Figure 24 shows that while the Thai commercial banks dominate most of the markets for consumer loan in Thailand, it is the non-banks that dominate the credit card market. Nevertheless, the average value of credit outstanding per account is the highest in foreign commercial banks (Figure 26). Moreover, Figure 25 shows that before 2006, credit card loans grew at very high rates. Since then, however, the growth rate of the credit card loans has been decelerating, along with the decline in the growth rate of the number of credit card accounts. This slower growth of credit card loans may partly be explained by the BOT's prescription of prudential guidelines in which the eligibility condition (by minimum income who can apply) for credit card loans, as well as the qualifications of companies that are allowed to provide credit card services were specified.

Figure 26
Summary of Thai Credit Card Market

	Number of Accounts		Credit Outstanding (million baht)		Credit Outstanding per Account (thousand baht)	
	2002Q4	2009Q2	2002Q4	2009Q2	2002Q4	2009Q2
Thai Banks	1,694,292	5,188,103	27,320	65,086	16.13	12.5
Foreign Bank Branches	717,640	1,321,359	15,902	33,867	22.2	25.6
Non-Bank	3,221,431	6,593,986	29,275	83,853	9.1	12.7
Total	5,633,363	13,103,448	72,498	182,807	12.9	13.9

Source: BOT, authors' calculation

4. Forces Behind the Rise of Household Indebtedness

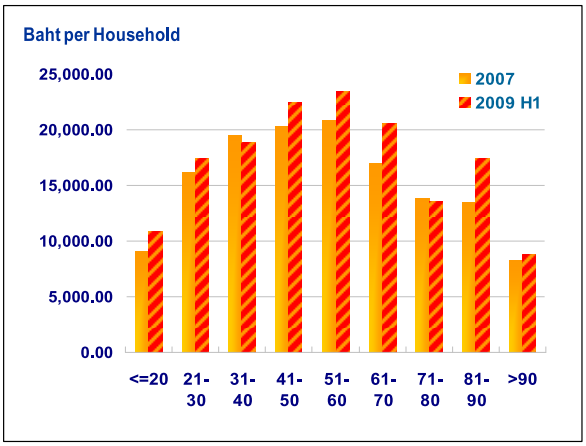
In this section, we attempt to identify the determinants of household indebtedness. We conjecture that the rise in household debt may depend on (1) household characteristics, (2) macroeconomic variables, (3) development in the financial sector, and (4) Government's policies.

4.1 Household Characteristics

4.1.1 Demographic Changes: Age Structure & Education Attainment Level

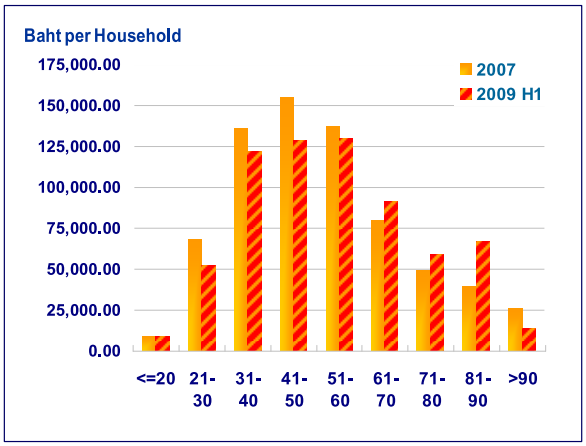
The life-cycle model predicts that in periods when income is low relative to average lifetime income, households will borrow. Later on, the loan will be repaid in periods when income is high relative to average lifetime income.

Figure 27
Distribution of Mean Household Income by Age Group



Source: NSO Socio-Economic Survey 2007-2009 H1, authors' calculation

Figure 28
Distribution of Mean Household Debt by Age Group



Source: NSO Socio-Economic Survey 2007-2009 H1, authors' calculation

Among Thai households, Figure 27 shows that the average income of households' primary earners rises as they get older and falls around the age of retirement (after 60 years old). In response, households tend to borrow in the early part of their working life and start to pay off their debt as they grow older. Hence, the implication is that an economy with relatively young demographic distribution (early working-age) will be more likely to accumulate higher level of aggregate household debt (Debelle, 2004).

Figure 29
Distribution of Population by Age Group

Distribution of Population by Age Group

Age	1994	1996	1998	2000	2002	2004	2006	2008
<20	37.7	36.6	35.3	34.2	32.9	31.9	30.9	28.3
20-60	54.8	55.4	56.2	56.9	57.7	58.3	58.7	60.5
>60	7.5	7.9	8.4	8.9	9.4	9.9	10.3	11.2

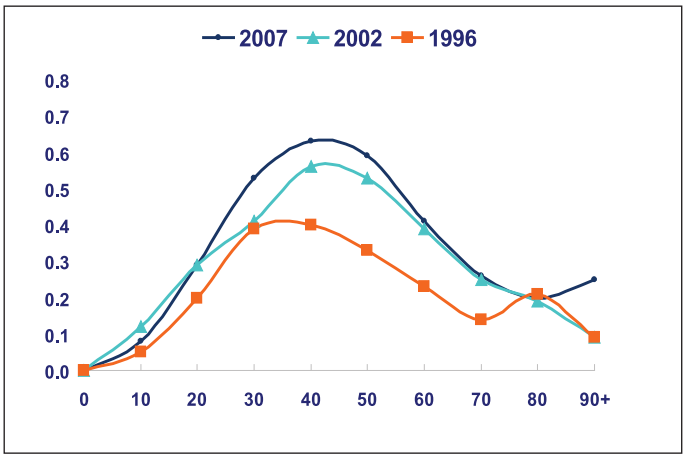
Source: Department of Provincial Administration, Ministry of Interior

Projected Distribution of Population by Age Group

Age	2010	2015	2020	2525	2030
<20	28.3	25.6	23.4	21.0	19.0
20-60	59.8	60.2	59.1	57.8	55.9
>60	11.9	14.2	17.5	21.2	25.1

Source: NESDB

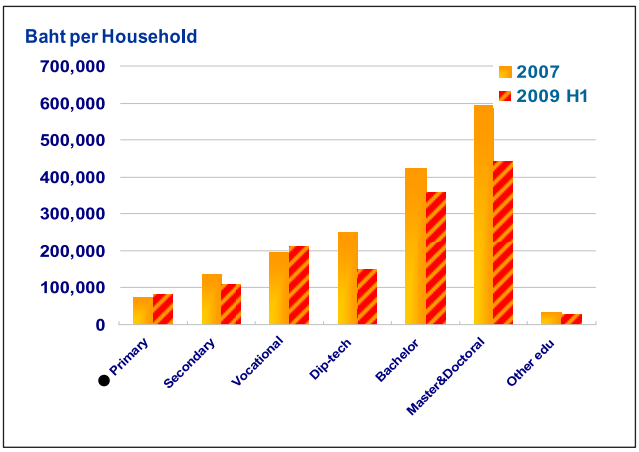
Figure 30
Mean Debt to Income by Age



Source: NSO Socio-Economic Survey 1996, 2002, 2007 authors' calculation

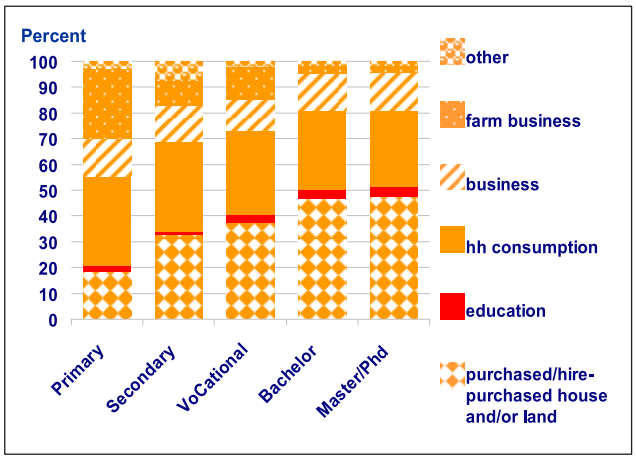
Population data from Figure 29 shows that the proportion of working-age population in Thailand grew from 54.8% in 1994 to about 58.3% in 2004, in line with the accelerated growth of household debt during that period. Moreover, Figure 30 draws a link between the age of household's primary earner and mean debt-to-income ratio. It shows that changes in age structure during the last decade have led to increases in the mean debt-to-income ratio in almost every cohort. In 2007, the mean debt-to-income ratio of household peaked when its primary earner aged around 40. Thereafter, the ratio started to decline.

Figure 31
Distribution of Mean Household Debt by Educational Level



Source: NSO Socio-Economic Survey 2007-2009 H1, authors' calculation

Figure 32
Purposes of Loans by Educational Level



Source: NSO Socio-Economic Survey 2007. authors' calculation

Educational attainment level may also influence the level of household debt. According to the SES analysis, households with primary income earners holding a bachelor degree or higher tend to accumulate higher amount of debt. This might be due to households' greater financial literacy, greater access to the formal sources of loans, as well as the use of household loans for educational purposes. Nevertheless, when the purposes of the loans are considered, we found that most of the debts incurred by households with higher level of educational attainment were for housing, while those with low educational attainment incurred debts for household consumption or farm businesses.

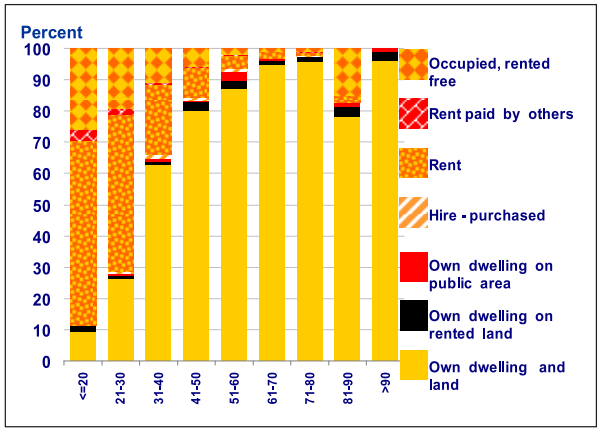
4.1.2 Home Ownership[4]

As mentioned earlier, most household debts are incurred for housing. Again, the life- cycle model could throw some light on the relationship between home ownership and age profiles. Specifically, most households have demand for their own dwellings during the early stage of their working life when most of the families are newly settled. Then when approaching the end of the working age, the demand for new houses declines.

When considering home ownership by the age group of household's primary earner, we found that the proportion of households possessing land and houses enlarges among households in their early working stage (between 20-40 years old). At the same time, the proportion of households that financed their homes through hire purchase is greatest among the middle-age groups, corresponding with the assertion that this cohort accumulates the greatest amount of household debts.

4. From the 2000 Population and Housing Census, the rate of homeownership in Thailand is about 80%.

Figure 33
Home Ownership by Age Group



Source: NSO Socio-Economic Survey 2009 H1, authors' calculation

Figure 34
Ordinary Least Squares Survey Regression of Log Debt

Variables	Coefficient	Base Unit
Ln(Income)	-1.2982***	
Ln(Income^2)	0.0884***	
Municipal	-0.0047	Non-Municipal
Age of Primary Earner	0.0563***	
Age^2 of Primary Earner	-0.0005***	
Home Ownership		Home Owner
Hire-Purchased	0.9747***	"
Rent	-0.3344***	"
Occupied, Rented Free	-0.0244	"
Education		Primary
Secondary	0.3338***	"
Vocational	0.6550***	"
Dip-Tech	0.7242***	"
Bachelor	0.9136***	"
Master & Doctoral	0.8755***	"
Other	-0.3275***	"
Career		Professional
Farm Operator	0.0716**	"
Entrepreneurs	-0.0842***	"
Laborer	-0.4703***	"
Economically Inactive	-0.2552***	"
Constant	12.4008***	
No. of Obs.	25,316	
R-Square	0.3971	

*** Indicates significant at 1%, ** Significant at 5%, * Significant at 10%
Source: Regression based on Socio-Economic Survey, 2007

An ordinary least squares regression of household debt on various household characteristics indicates a concave-shaped relationship between ages of primary earners and household debt, which is consistent with the life-cycle theory. Moreover, using primary education as the base unit, the higher the educational attainment level of the primary income earner, the higher the amount of debt is incurred by a household. As for the home ownership aspect, as compared to households that have their own dwellings, households that finance their homes through hire purchase incurred greater amount of household debt.

Other household characteristics such as income and occupation may also influence the level of household debt. The coefficients on the linear and squared terms of income are positive and negative, indicating a smile-shaped pattern – households with relatively low income and relatively high income seem to have a higher level of household debt. Occupation-wise, as compared to professional households, households that are farm operators tend to incur a higher level of debt.

4.2 Macroeconomic Variables

Besides household characteristics, macroeconomic environment may also play an important role in determining the level of household debt. Some of the key variables include changes in house prices, interest rate, inflation rate, GDP, private consumption expenditure, and unemployment rate.

4.2.1 House Price

Most of the household loans are for mortgages. Therefore, house price may play a significant role in determining the rise and the fall of household indebtedness. According to a study by Subhanij (2009), a rise is house prices could encourage households to consume more and build up debt by betting on higher expected future income. Moreover, the higher house prices are relative to household income, the more debt households have to incur to buy housing (Debelle, 2002). Figure 35 shows that the growth in household debt appears to be correlated with the growth in house price. Given the recent slowdown in the housing market after the financial crisis, it is likely that this experience would accompanied by a slowdown in household indebtedness.

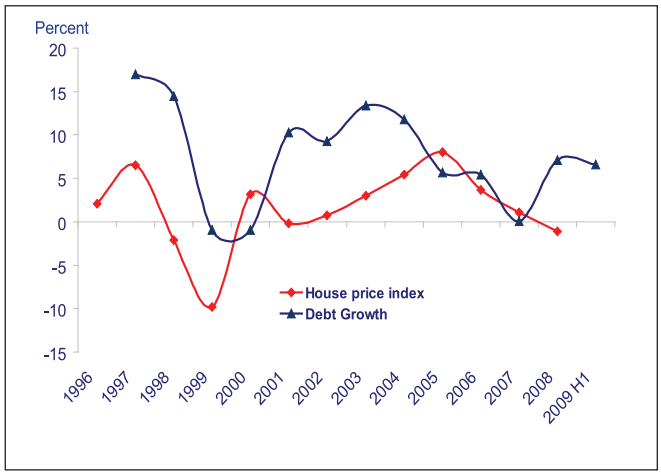
4.2.2 Interest Rate

Another macro factor that may influence household debt is the interest rate. This is because a long period of low interest rate may be an incentive for

households to borrow. For example, when the interest rate is halved, households can double their take-out loan and still face the same servicing cost.

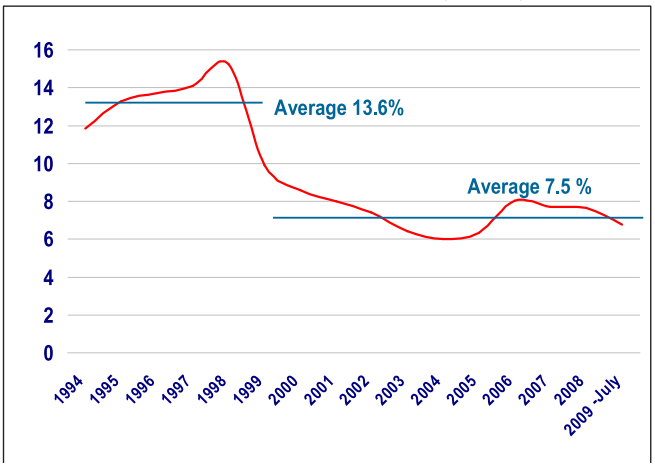
In Thailand, the nominal interest rate that household faced (MRR) averaged at 13.6% between 1994 and 1998. After that, the interest rate dropped significantly to an average of 7.5%, in line with the rising household debt after the Asian financial crisis.

Figure 35
Growth of House Price Index



Source: BOT, NSO Socio-Economic Survey, authors' calculation

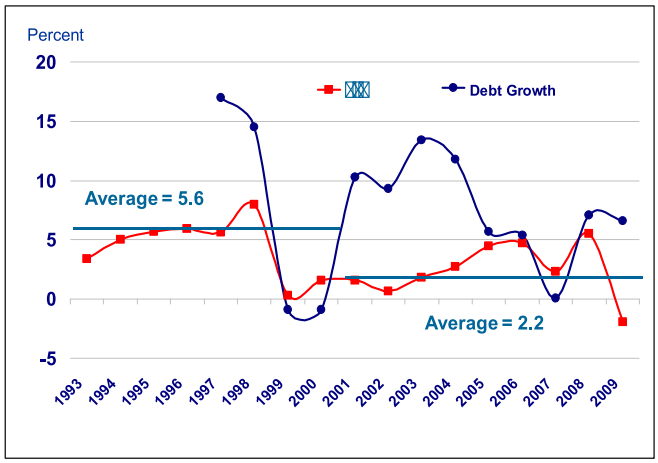
Figure 36
Nominal Interest Rate (MRR)



Source: CEIC, author's calculation for averages

4.2.3 Inflation

Figure 37
Inflation Rate



Source: BOT, NSO Socio-Economic Survey, authors' calculation

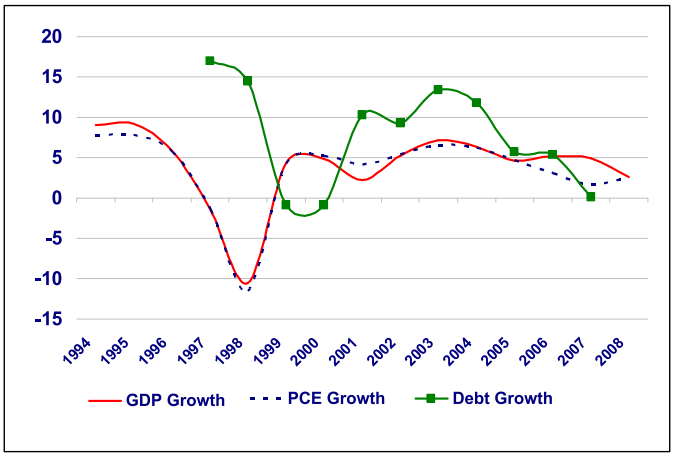
In Thailand, during 1993 to 1998, the headline inflation averaged at 5.6% per year. However, after the financial crisis, the inflation rate declined rapidly.

The fall in the interest rate was only possible because during the same period, there had been a fall in the rate of inflation. This exerted an influence on the debt-to- income ratio in that it raises the numerator level as households increase their borrowing. Moreover, inflation also has a separate effect on household indebtedness through lower nominal income growth. Specifically, in a low inflation environment, nominal income growth erode the real value of the debt less rapidly than a high inflation one, contributing to a higher aggregate household debt- to-income ratio.

4.2.4 GDP, Private Consumption Expenditure (PCE), and Unemployment Rate

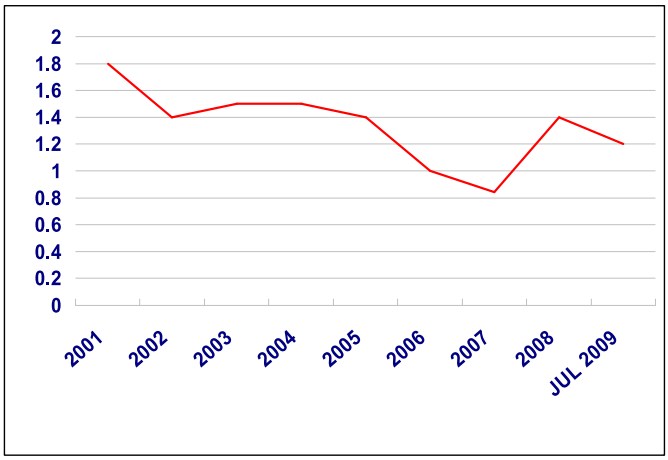
Rising GDP growth coupled with a period of low unemployment may lead to higher consumer confidence and rising consumer spending. In Thailand, after the financial crisis, the economic growth began to pick up and continued to expand throughout 2002 and 2003. This had caused the private consumption expenditure to expand accordingly. In other words, households had increasingly taken out loans to finance their consumption.

Figure 38
GDP & PCE Growth



Source: NESDB, NSO Socio-Economic Survey, authors' calculation

Figure 39
Unemployment Rate



Source: CEIC

Figure 40 shows the correlation matrix of macro variables discussed above. House prices are strongly and positively associated with household debt as well as GDP and Private Consumption. Meanwhile, the MRR is strongly and negatively correlated with household debt.

Figure 40
Correlation Matrix: 1996-2007
(Household Debt Data from SES survey)

	Household Debt	House Price	MRR	Inflation	GDP	PCE	Unemployment Rate
Household Debt	1						
House Price	0.7577	1					
MRR	-0.7276	-0.1686	1				
Inflation Rate	-0.1611	0.3856	0.6975	1			
GDP	0.9212	0.8344	-0.6289	-0.0946	1		
PCE	0.9178	0.8118	-0.6567	-0.087	0.9933	1	
Unemployment Rate	-0.4425	-0.6314	0.2225	-0.1572	-0.7149	-0.744	1

4.3 Financial Sector Development

Thai household credit growth has partly been the result of the 1997 financial crisis as banks restructured their asset portfolios and business models to diversify risks away from the corporate sector (Nakornthab, 2007). Coupled with ample liquidity in the commercial system, this development resulted in enlarged credit pool for households.

In addition, financial product innovation, such as lengthening of the maturity of some mortgages and constant payment loans, may also be responsible for the increasing demand for consumer loan. Meanwhile, the establishment of two credit bureaus, the Thai Credit Bureau (TCB) and the Central Credit Information Service (CCIS), and the use of credit scoring model that allowed increased information sharing, helped mitigate the problem of adverse selection. As a result, banks could increase their credit coverage to consumers whom would have previously been declined due to lacking of credit information (Thaicharoen, Ariyapruchya, & Chucherd, 2004).

4.4 Government Policies

The Thai authorities have emphasised measures to broaden access to financial services. This has been conducted via the Financial Sector Master Plan which suggests that financial infrastructure should be improved in 3 ways: to address low income households, to upgrade the BAAC into a rural development bank, and to support community financial organisation. Moreover, the plan aims at increasing competition from foreign banks and reducing the importance of informal sources of loans, such as money lenders, by allowing more operations by non-bank financial institutions (Menkhoff & Suwanaporn, 2007).

During 2002-2004, the Thaksin administration implemented a series of new credit programmes, the most prominent being the Village Fund Scheme started

in 2002. The programme promised to provide a million baht (approximately US$ 33,000) to every village in Thailand as working capital for rotating credit associations run by the locals. However, the intermediaries handling the money are not the village fund committees themselves, but are mainly the SFIs, such as the BAAC which operates in rural areas and semi-urban communities. The programme has enhanced financial access, especially people in the non-municipal area as mentioned earlier (Figure 5). As the government tried to uplift and improve the economic position of the poor, these measures propagated a bad attitude among the poor toward indebtedness. Some felt that being indebted was a perfectly normal thing (Thavornthon et al., 2009) while others felt that they did not have to repay their loans on time as the funds were sponsored by the government (Siripanyawat et al., 2007). This negative attitude will lead to an increase in the debt level of the poor and will cause financial hardship in the event any shocks.

Another government policy that may have an important impact on household indebtedness is the tax system, particularly the tax treatment for house purchase. The recent reduction in transfer fees from 2% to 0.01% and Specific Business Tax from 3.3% to 0.11% for property purchased on a new development may be incentives for households to take out housing loans.

4.5 An Empirical Model of Household Debt

In this section, we attempt to identify an estimated model of consumer loan extended by commercial banks. In Thailand, commercial banks finance almost 60% of all consumer loans, while the SFIs are also dominant players. Due to time series data limitation on the SFIs, however, we take consumer loan extended by commercial banks as representative for household debt.

4.5.1 The Data

Our data covers Q3:1998 to Q2:2009, consisting of 44 quarterly data points. The data set contains 4 variables: (1) consumer loan (Loan), (2) GDP (real GDP sa.), (3) farm price index, and (4) house price index. All the variables are deflated by the headline consumer price index (CPI), and the GDP is seasonally adjusted.

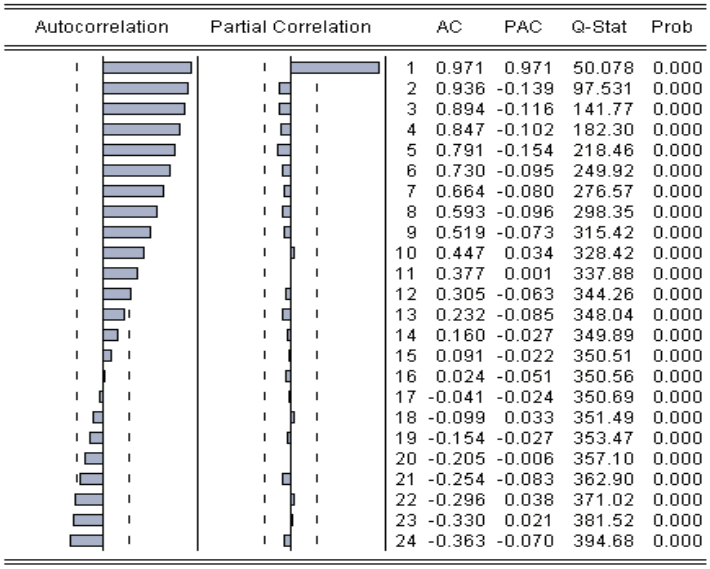
As mentioned earlier, these macro variables are conjectured to be some of the forces behind the rise of Thailand household indebtedness according to the permanent income theory. The GDP captures the state of the economy. A higher GDP signifies a booming economy, and therefore, a rise in consumer

confidence and consumer spending. The farm price index is loosely used as a proxy for household income or purchasing power, while the house price index is considered a proxy for household wealth. As stated earlier, greater income and wealth may encourage households to accumulate debt by betting on higher expected future income prospects.

4.5.2 The Method

In general, most time series data are non-stationary. If the time series are non-stationary, the variables would suffer permanent change as they have non-constant mean, variance, and covariance. In contrast, for stationary time series, shocks will be temporary and over time the effects will be eliminated as the series revert to their long-run mean values (Asteriou et al., 2007). As seen from Figure 41, the log of real consumer loan is non-stationary as the correlogram falls very slowly toward zero as the lag length increases. To deal with this non-stationarity problem, we adopt the error-correction model (ECM) by following a 4-step approach.

Figure 41
Correlogram of Log (Real Consumer Loan)



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.971	0.971	50.078	0.000
		2	0.936	-0.139	97.531	0.000
		3	0.894	-0.116	141.77	0.000
		4	0.847	-0.102	182.30	0.000
		5	0.791	-0.154	218.46	0.000
		6	0.730	-0.095	249.92	0.000
		7	0.664	-0.080	276.57	0.000
		8	0.593	-0.096	298.35	0.000
		9	0.519	-0.073	315.42	0.000
		10	0.447	0.034	328.42	0.000
		11	0.377	0.001	337.88	0.000
		12	0.305	-0.063	344.26	0.000
		13	0.232	-0.085	348.04	0.000
		14	0.160	-0.027	349.89	0.000
		15	0.091	-0.022	350.51	0.000
		16	0.024	-0.051	350.56	0.000
		17	-0.041	-0.024	350.69	0.000
		18	-0.099	0.033	351.49	0.000
		19	-0.154	-0.027	353.47	0.000
		20	-0.205	-0.006	357.10	0.000
		21	-0.254	-0.083	362.90	0.000
		22	-0.296	0.038	371.02	0.000
		23	-0.330	0.021	381.52	0.000
		24	-0.363	-0.070	394.68	0.000

Step 1: Pre-test the variables for their order integration. By definition, cointegration necessitates that two variables be integrated of the same order. The Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) test is used to infer the number of unit roots in each of the variables.

A summary of the tests is presented in Figure 42. The results of both ADF and PP confirm our belief that most of the time series data are non-stationary. However, these time series become stationary with the first difference - I(1) except for the real interest rate which is I(0)

Figure 42
Unit Root Test Result

Variables	ADF Test[1]		Philips-Perron[2]	
	Level	1st Difference	Level	1st difference
Log (real GDP sa)	-1.23 (0.65)	-9.40*** (0.001)	-1.22 (0.616)	-9.46*** (0.001)
Log (Loan)	0.93 (0.99)	-3.79*** (0.01)	0.21 (0.971)	-3.69*** (0.01)
Real Farm Price	-0.83 (0.80)	-2.49** (0.021)	-0.21 (0.931)	-7.55*** (0.001)
NPL	-0.62 (0.86)	-4.64*** (0.001)	-0.63 (0.851)	-5.25*** (0.001)
Real MRR	-5.54*** (0.00)	-7.52*** (0.001)	-4.96*** (0.001)	-15.82*** (0.001)
Unemployment	-2.21 (0.21)	-13.85*** (0.001)	-3.00*** (0.041)	-13.06*** (0.001)
House Price	-1.36 (0.591)	-11.54*** (0.001)	-1.01 (0.741)	-11.54*** (0.00)

Notes: 1) Lag selection based on Schwarz Information Criterion
2) Bandwidth: automatic selection (Newey-West using Barlett Kernel spectral estimation method)
3) Exogenous: None
4) Numbers in parentheses are MacKinnon (1996) one-sided p-values
5) *** Indicates significant at 1%, ** Significant at 5%, * Significant at 10%

Step 2: Estimate the long run equilibrium relation.

$$\log(\text{Loan})_t = \beta_1 + \beta_2 (\text{farm price})_{t-4} + \beta_3 \log(\text{real GDP sa})_{t-4} + \varepsilon_t$$

Step 3: In order to determine if the variables are actually cointegrated, we test the residual (ε_t) from the long run relationship. If the error term is found to be stationary at level or I(0), the dependent variables Y_t and independent variables X_t are cointegrated.

Step 4: If the variables are cointegrated, the residuals from the equilibrium regression can be used to estimate in the error-correction model (the short-run equation).

4.5.3 Results of the Empirical Study

Figure 43
Estimated Error-correction Model of Log of Real Consumer Loan

$\Delta\log(loan)_t =$ $0.176^{***}\Delta(FarmPrice_{t-2}) + 0.474^{*}\Delta\log(real\ GDP\ sa_{t-2}) +$
(3.67) (1.77)

$+ 0.123^{**}\Delta(HousePrice_{t-1}) + 0.396^{***}\Delta\log(loan_{t-2}) - 0.242^{***}\ ECM_{t-1}$
(2.12) (3.53) (-2.91)

Adjusted $R^2 = 0.48$ S.E of regression = 0.03 LM(2): 0.19 (0.83)

$ECM_t =$ $\log(Loan)_t - [\ -4.728^{***} + 0.343^{***}(FarmPrice_{t-4})$
(-4.08) (6.79)

$+ 1.361^{***}\log(real\ GDP\ sa_{t-4})]$
(10.77)

Adjusted $R^2 = 0.97$

Note: Number of observation = 42 after adjustments (Q1:1999- Q2:2009)
t-statistics are in parenthesis.
$^{***, **, *}$ denote significance at 1%, 5%, and 10%, respectively

Figure 43 presents the results of the ECM regression of the log of the real consumer loan and the t-statistics of estimated coefficients for the long run (the second equation in Figure 43) and the short-run regression (the first equation in Figure 43).

The model for the long-run equation can explain the rise and the fall of consumer loan by around 97%. The signs of the coefficients of each variable are as expected. The coefficients for farm price and GDP display positive signs, confirming our hypothesis that households increase their taking out of consumer loans as their income prospect seems to be on the rise.

In the short-run equation, the first difference of the log of consumer loan is regressed against the lag of the first difference of the log of real GDP, the lag of the first difference of the farm price, the lag of the first difference of house price, the lag of the first difference of the consumer loan, and the lag of the residual (ECM) from the long-run equation. The rise in the consumer loan

is associated with the good state of economy, the farm price, the house price as well as the lag of consumer loan. The coefficient of ECM is less than one and significant at 99% confidence level, suggesting that the estimated regression is accurate. The coefficient of -0.24 suggests that 24% of the discrepancy is eliminated in the next quarter.

5. Assessment of Household Debt Vulnerability

Rising household debt is not always a problem in itself as it may reflect the ability of households to smooth their consumption over time. However, too much debt burden may create household financial stress and affect financial institutions through rising NPLs.

To gauge household debt vulnerability, two approaches are usually applied: (1) Measuring of household debt burden (i.e. debt-to-income ratio, debt-to-asset ratio and debt service ratio) and (2) Monitoring of household credit quality (i.e. NPL and delinquency rates).

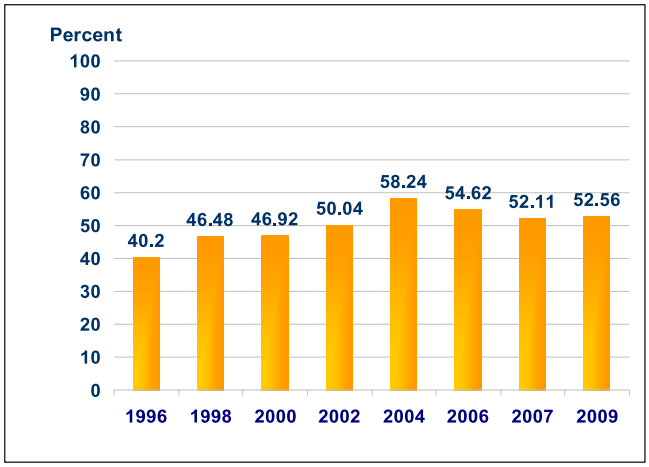
5.1 Household Debt Burden

One measure of household indebtedness (debt burden) is the debt-to-income ratio. Nevertheless, a hindrance to this measure is its comparison of a stock variable (debt) to a flow variable (income). However, given that the flow of debt service is correlated with debt stock, and also upon the availability of the data, the debt-to-income ratio is considered an informative indicator of household debt burden.

Figure 44 shows that in Thailand, the aggregate debt-to-income ratio increased from 40% in 1996 to 58% in 2004, but then decreased to about 52% in 2007 and remained stable in H1:2009.

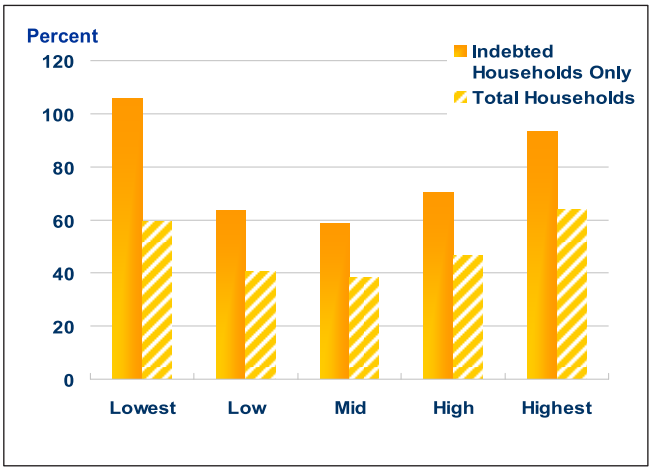
Nevertheless, the time-series aggregate data may conceal some interesting facts about the characteristics of Thai household indebtedness. For example, when considering the distribution of debt-to-income ratio by income quintile, it was found that the debt-to-income ratios had a “smile” pattern, with the ratios for the highest and the lowest income groups being higher than the middle income groups. When looking at indebted households only, the survey revealed that households in the lowest income group had a very high debt burden, indicating that these households may face with relatively greater degree of household financial stress (Figure 45).

Figure 44
Average Debt to Income Ratio



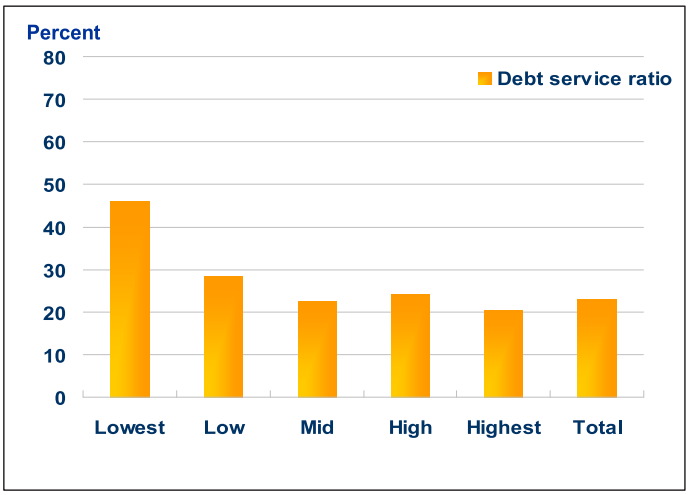
Source: NSO Socio-Economic Survey 1996-2009, authors' calculation

Figure 45
Distribution of Debt to Income Ratio (by Income Group)



Source: NSO Socio-Economic Survey 2007, authors' calculation

Figure 46
Debt Service Ratio



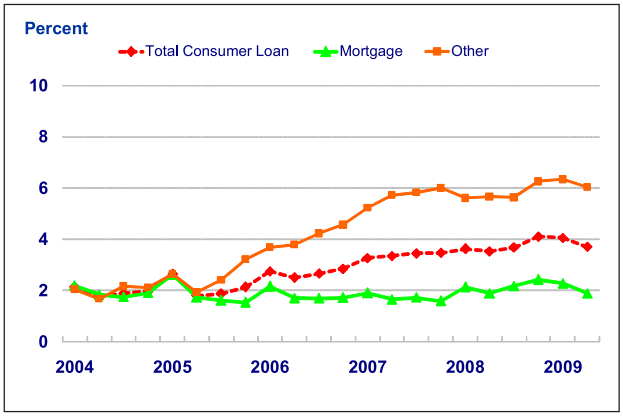
Source: NSO Socio-Economic Survey 2009 H1, authors' calculation

Another informative ratio for gauging household debt vulnerability is the debt service ratio, defining as the ratio of monthly debt payments to monthly income. In H1:2009, the Thai household debt service ratio stood at 23.1%, showing that Thailand's households remain liquid. Nevertheless, when considering the distribution of the debt service ratio by income quintile, we found that households in the lowest income group have the highest debt service ratio of approximately 50.0%. Again, this suggests that poor households may be under higher financial stress.

5.2 Quality of Consumer Loan (Delinquency Rate and NPL Ratio)

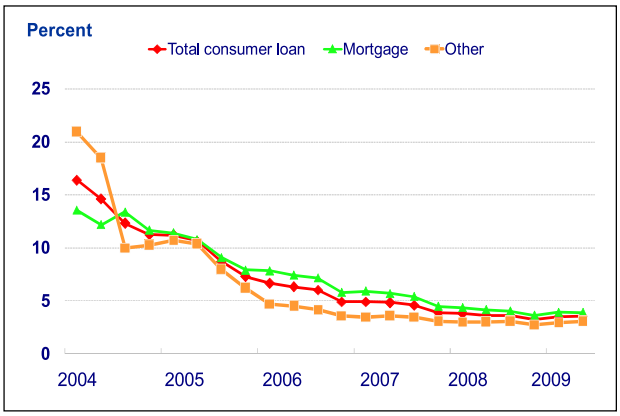
Another indicator of household debt vulnerability is the quality of consumer loan as measured by the delinquency rate and the NPL ratio. Figure 47 shows that the delinquency rate for consumer loan (the amount of loan that past due between one and three months to total loan) had been rising since the middle of 2005 and slowing down in 2009. However, this development has not translated into rising NPL ratios – the amount of loan that past due more than 3 months as a percentage of the amount of loan. In fact, Figure 48 shows that the NPL ratios remain low even during the financial crisis. The decline in NPL may be attributable to the debt restructuring, writing-off, and close monitoring of asset quality to prevent the formation of new NPL by financial institutions.

Figure 47
Delinquency by Types of Consumer Loan (CBs)



Source: BOT, authors' calculation

Figure 48
NPL Ratio by Types of Consumer Loan (CBs)



Source: BOT, authors' calculation

When considering delinquency ratios and NPL ratios by types of consumer loan, we found that the delinquency ratio for other consumer loan is higher than the ratio for mortgage loan. On the contrary, the NPL ratio of mortgage loan is higher than that of other consumer loan which includes auto leasing, education, and travel. This development implies delinquency ratio is not entirely translated into NPL ratio. In fact, the way financial institutions handle consumer loan is an important rationalisation for the ways delinquency and NPL ratios behave. Specifically, financial institutions are quicker to exercise auto loan and other

consumer loan foreclosures than to exercise of mortgage foreclosures. As a result, the relatively higher delinquency ratios observed among other consumer loan do not show in the NPL ratios.

The rise in the exposure of commercial banks to the household sector and the occurrence of subprime loan problem in the US has raised concerns over the vulnerability of the Thai banking system with regards to consumer loan. In this section, we examine the impact of consumer loan on the vulnerability of the financial system under various economic shocks by applying a financial stress test. Bear in mind, however, that one shortcoming of a stress test is that it provides a rough indicator not a forecaster of financial institution's failure. Furthermore, the stress test is a static model which does not include the reaction by the institutions or supervisors.

5.3 An Empirical Model of Consumer Loan's NPL

According to the ability-to-pay hypothesis, a borrower tends to default on loan if he/she faces an income shock or unfavorable change in loan terms that make it impossible for him/her to keep up with the payments. These shocks may be related to the borrower's situation such as a divorce, an emergency medical care, or related to macroeconomic shocks such as unemployment or interest rate. The shock related to personal circumstance leads to default here and there, while the economic shock tend to have much stronger impact on the loan default at aggregate level (Igan and Pinheiro, 2009).

In this section we attempt to identify a model for consumer NPL ratio that can later be used for scenario analysis.

5.3.1 The Data

The data set contains the following variables: (1) NPL ratio, (2) real consumer loan, (3) real interest rate (*real MRR*), (4) unemployment rate, and (5) seasonally-adjusted real GDP (real GDP sa.). There were 44 quarterly data points dated back to Q3:1998.

Real consumer loan is a proxy for the level of consumer debt in the banking sector. It is expected that NPL may rise in response to rising consumer loan. Meanwhile, the real interest rate is a proxy for the cost of repayment. If the interest rate is on the rise, households facing with floating interest rates may experience difficulties in repaying their loans as the monthly payments rise with

interest. The unemployment rate reflects the ability of households to generate future income to repay debt while the GDP reflects the state of the economy.

5.3.2 The Method

We run the ADF on the NPL ratio. The ADF test fails to reject the null hypothesis that NPL ratio is a unit root. As a result, in this paper, we follow Nakornthab & Na Suwan (2007) in using Error-correction Model (ECM) as to deal with the unit root problem.

Step 1: We estimate a long-run equilibrium relationship as:

$$NPL_t = \beta_1 + \beta_2 \log(\text{real GDP sa})_t + \beta_3(\text{real MRR})_{t-3} + \beta_4 \log(\text{Loan}) + \beta_5(\text{unemployment})_{t-4} + \varepsilon_t$$

Step 2: We test the residual (ε_t) from the long-run relationship and find that the residual from the long-run equation is I(0), meaning that the variables are cointegrated. Therefore, the residuals from the equilibrium regression can be used in the estimation of the error-correction model or the short-run equation.

5.3.3 The Result

Figure 49
Estimated Error-correction Model of the Ratio of Non-performing Loans

$$\Delta NPL_t = -0.01^{***} - 0.28^{*}\Delta\log(\text{real GDP sa}_t) + 0.003^{**}\Delta(\text{real MRR}_{t-3})$$
$$(-4.04) \quad (-2.01) \qquad\qquad (2.17)$$
$$+ 0.16^{***}\Delta\log(\text{Loan}_t) + 0.005^{**}\Delta(\text{unemployment}_{t-4}) - 0.26^{**}ECM_{t-1}$$
$$(3.62) \qquad\qquad (2.13) \qquad\qquad (-2.42)$$

Adjusted $R^2 = 0.34$ S.E of regression = 0.01 LM(2): 0.67 (0.51)

$$ECM_t = NPL_t - (9.45^{***} - 1.15^{***}\log(\text{real GDP}_t) + 0.01^{***}(\text{real MRR})_{t-3}$$
$$(18.24) \quad (-16.68) \qquad\qquad (3.04)$$
$$+ 0.21^{***}\log(\text{Loan}_t) + 0.01^{*}(\text{unemployment}_{t-4}))$$
$$(8.37) \qquad\qquad (1.72)$$

Adjusted $R^2 = 0.98$

Note: Number of observation = 42 after adjustments (Q1:1999- Q2:2009)
t-statistics are in parenthesis.
$^{***}, ^{**}, ^{*}$ denote significance at 1%, 5%, and 10%, respectively

Figure 49 presents the result of the ECM regression and the t-statistics of the estimated coefficients of the long-run and short-run regression. Starting off with the long-run estimation (second equation in Figure 49), the signs of the coefficients of the explanatory variables are as expected. The positive coefficients of the real interest rate, log of real consumer loan, and the unemployment rate suggests that when interest rate, consumer loan, or unemployment rate increase, the ratio of non-performing loan to total consumer loan may also increase. An increase of one percent of log of the real consumer loan will lead to about a 0.21% rise in the NPL ratio. Meanwhile, the one hundred basis point increase in the real MRR and one percent increase in the unemployment rate both lead to an increase in NPL ratio by 0.01. Another variable in the long-run equation is the log of real GDP which enters a negative coefficient. An increase of one percent of the log of real GDP will lead to 1.15% reduction in the NPL ratio.

The variables in the short-run dynamic equation (first equation in Figure 49) are the first differences of the NPL ratio, the log of the real GDP, the real MRR, the log of the real consumer loan and the unemployment rate. The last term is the lag of the residual from the long-run equation. The short-run equation suggests that the rise in the real interest rate, the consumer loan and the unemployment rate will raise the NPL ratio. Meanwhile, the rise in the log of real GDP will lower the NPL ratio. The coefficient of the ECM term is negative and significant at 5% level.

5.3.4 Stress Test

Next, we perform a stress test exercise by exploring the potential developments in NPL under a stressful circumstance using our conjectured model.

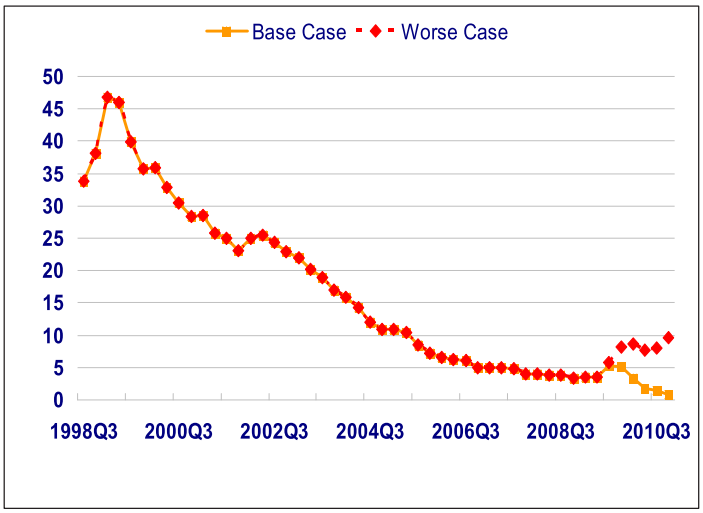
Our base case relies on the scenario forecasted by Bank of Thailand. Since Q4:2008, the Thai export sector has been hard hit by the impact of the world financial crisis. However, the rapid implementation of the monetary policy and stimulus packages from the fiscal side are expected to take effect. The BOT, therefore, forecasted that the Thai economy would experience a positive growth in Q4:2009. Hence, in the base case scenario, the Thai economy is expected to experience a negative growth in the third quarter of 2009, and turn around to expansion thereafter.

For the worse case scenario, we set the GDP to contract at an increasingly lower rate. Figure 50 summarises the assumptions of the GDP for the period between Q3:2009 to Q4:2010. The unemployment rate is set to be varied with the GDP such that a one percentage increase in the seasonally-adjusted real GDP will lower the unemployment rate by 0.03%.

Figure 50
Macro Assumptions (Q3:2009– Q4:2010)

	Base Scenario	Worse Scenario
Unemployment	Varied with GDP	Varied with GDP
R_MRR	Same as Q2:2009	Same as Q2:2009
Farm income	Same as Q2:2009	Same as Q2:2009
Log(consumer loan)	Projected from the previous section	Projected from the previous section
%Ch_GDP		
2009Q3	-4	-6%
2009Q4	3	-6%
2010Q1	6	-5%
2010Q2	4	-4%
2010Q3	3	-3%
2010Q4	2	-2%

Figure 51
Two Potential Paths for Future Consumer NPL ratio



Source: BOT, authors' calculation

Figure 51 depicts the dynamic forecasts of the NPL ratio of the consumer loan from Q3:2009 to Q2:2010 under two different scenarios. Under the base case scenario, the NPL ratio is expected to rise in the third quarter of 2009 increasing by more than 100 bps but then gradually falling to about 1.0% following the revival of the economy and rising GDP. Under the worse case scenario, however, the NPL ratio rises significantly from 3.6% in Q2:2009 to 9.6% in Q4:2010.

6. Conclusion and Policy Implications

In this paper, we rely on two sources of data: (1) household survey and (2) consumer loan.

The data from the household survey indicates that the level of average household debt has reversed from a downward trend and accelerated. This has led to the expectation that the aggregate household debt to GDP will rise in 2009. Further analysis shows that the main reason for the rise in household debt is because those who have accumulated debt are borrowing more, rather than households originally without debt engaging in borrowing. This implies that the indebted households may be experiencing a higher debt burden. Nevertheless, the analysis of household debt-to-income ratio and debt service ratio shows that Thai households remain on average financially sound. However, the low income households are more likely to experience financial difficulties in times of economic shocks as their debt- to-income ratio is more than one, and their debt service ratio is at a high level. Likewise, the households with high income also tend to have higher indebtedness. It is to be noted we did not discuss the wealth aspect of Thai households in this paper. This is because the most recent data on household financial asset is from the BOT-NSO survey in Q4:2006, which has already been discussed in Ariyapruchya, K., Sinswat, W., & Chutchotitham, N. (2007).

Policy Implication 1: The distribution of household indebtedness across Thai households has important policy implications in terms of the sensitivity of households to the impact of shocks on income, interest rates, and house prices. For example, those in the high income group may be less sensitive to rises in unemployment but may be more sensitive to fluctuations in wealth, such as rising or falling house prices, interest rates (return to asset), or share price movement (Debelle, 2004). As a result, when making decision, policy makers must not merely look at the aggregate level, but also consider the distribution of household indebtedness by household characteristics such as income group or occupational group.

Policy Implication 2: There is an urgent need for data on the net worth of Thai households so that the analysis of household debt vulnerability will be more accurate. The Bank of Thailand is well aware of this problem and is attempting to develop a household survey that will measure household assets (financial, real estates, vehicles, etc.) so that the household balance sheet can be constructed and monitored on a regular basis.

Another source of household debt data is the consumer loan data. However, it is to be borne in mind that due to limited data on the SFIs, this paper focuses mainly on consumer loan extended by commercial banks and other financial institutions (excluding SFIs), which represents almost 60% of all consumer loan. The data indicates that consumer loan growth has been decelerating during the recent episode of the financial crisis. This seems to be in conflict with the data obtained from the survey. However, when looking at consumer loan extended by some SFIs, such as the Government Saving Bank, it has been observed that the growth rate has been accelerating.

Policy Implication 3: In order to get a comprehensive picture of Thailand household indebtedness, the role of the SFIs must not be left out. It is important for the Thai authorities to develop a database for the consumer loan data and NPL for all the SFIs.

Policy Implication 4: It will be very useful if we can classify consumer loan according to income group the same way we did as with the survey data, as we believe the borrowing behavior of household with high income and low income differ greatly.

Next, we attempt to identify the determinants of rising household debt. We find that household characteristics (such as the age of household's primary earner, education attainment level, and homeownership), macroeconomic conditions, developments in the financial sector, as well as government policies seem to dictate how household debt rises or falls. By following the permanent income theory, we identify an ECM model that explains the rise of consumer loan extended by commercial banks. We find that future income and wealth prospects can influence the amount of loans taken out by households. In other words, a rise in farm income, GDP and house price may increase the level of debt borne by the household sector.

Policy Implication 5: Currently, the level of consumer loan has not begun to create problems in terms of financial stability. However, there are a number of things that policy makers need to consider. First, the stability of the housing market may influence the level of consumer loans as mortgage loan is over 50% of the entire consumer loan portfolio. Therefore, any government policies or tax measures that influence the housing market or house price may also create household debt vulnerability. Secondly, it seems that the BOT as well as the government are moving towards the direction of expanding financial access to the household sector, especially the household sector in the rural area. The measures are through programmes that are similar to the village fund programme discussed above, as well as via micro-financing. In the past, we have witnessed that these types of policy tended to create a hike in household indebtedness. Although, greater access may bring about greater financial opportunities for households, it is important for policy makers to strike the right balance between access and quality of the loan. Furthermore, for households to benefit from the government programmes to the fullest measure, it is advisable to promote financial literacy so that people can understand the risks and benefits of the financial services offered.

Household loans and macroeconomic shocks also influence the consumer NPL ratio of the commercial banks. Our model indicates that the macroeconomic variables that reflect the income prospects of households (GDP and unemployment rate) may influence the consumer NPL ratio. Moreover, the rise in interest rate may cause household repayment burden to rise and put a stress on the NPL. As to the relationship between household loans and NPL ratio, we find that rising household debt raises the level of NPL. However, the effect of the GDP or the economic condition is much stronger and may offset the

effect of rising consumer loan. In the worse case scenario with the assumption that the economy will recover at a slower rate, the NPL ratio rises to about 9.1% which is approximately the level we faced in 2004-2005. Therefore, we conjecture the household consumer NPL ratio would not be detrimental to financial stability in Thailand in the near future.

Policy Implication 6: When conducting monetary policy, the Central Bank should ensure that the interest rate (i.e. MRR) is at an appropriate level. A prolonged period of low interest rate may lead to a hike in consumer loan. Meanwhile, raising interest rate in an economy that has not recovered will add to the financial burden of indebted households, causing consumer NPLs to rise.

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Appendix

Data for ECM

Variables	Description	Sources
Consumer Loan	Personal Consumption Section includes: 1. Land buying for personal use. 2. Personal Acquisition of residential units. 3. Personal Acquisition of real estate for the purpose other than (1) and (2). 4. Purchase or hire purchase of automobiles and autobikes. 5. Education. 6. Travel to work abroad. 7. Other personal consumption. The data that are compiled from the balance sheets of commercial banks include domestically registered commercial banks & branches of foreign banks. The series is at the end of period.	Calculated by the authors based on the quarterly data from Bank of Thailand DMS
NPL ratio	Non-performing / Total Consumer Loan. Non-Performing Loans. • June 1998 – November 2002: o Gross NPLs are over 3 months past due loans. • December 2002: o Gross NPLs are loans that classified as substandard, doubtful, doubtful of loss, and loss, including the doubtful of loss loans having been written off earlier, which were written back. • March 2003 – Present: o Gross NPLs are loans that classified as substandard, doubtful, doubtful of loss.	Calculated by the authors based on the quarterly data from Bank of Thailand DMS
GDP	Seasonally Adjusted Gross Domestic Product (1988 price).	Office of the National Economic and Social Development Board
Housing Price	Housing Price Indices have been compiled using Hedonic Method from the Government Housing Bank (GHB) appraisal database by Real Estate Market Research Department, Real Estate Information Center. The indices have some limitations to the extent that the data mostly cover medium- to low-end of housing market and are concentrated mostly on the periphery of the central BKK and vicinity.	Bank of Thailand

Farm Price Index	Index measures changes in price of agricultural products, including crops, livestock, fisheries and forestry, traded among local markets during a specified period as compared to base year (1995).	Bank of Thailand

Variables	Description	Sources
Unemployment Rate	The data is obtained by survey taken during the 1st – 12th of each month. Data are collected by NSO officers through interview with head or member of the household units that participated in the survey. Data compilation is based on weighted average of sampled data, the details of which appear in the NSO's website (www.nso.go.th) under the topic "Labour Force Survey".	Bank of Thailand
MRR	The interest rate at which the lending commercial bank charges its most creditworthy retail borrowers on loans. The series is end of period. Since January 2000, the series have been quoted by the 5 commercial banks (Bangkok Bank, KrungThai Bank, The Siam Commercial Bank, Kasikorn Bank, and Bank of Ayudhya)	Bank of Thailand
CPI index	Headline inflation	Bureau of Trade and Economic Indicator