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Rising Household Debt: Implications for Economic Stability

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Abstract

This study examines whether there is empirical ground to the conventional wisdom that the rising household debt Thailand experienced over the past few years has increased risks to macroeconomic stability. We find that while the recent debt surge does not raise short-term risk to the financial system, it has represented a key impediment for economic growth. We also establish the critical DSR threshold of 40%. Above this level, households in all occupations exhibit a significant increase in their predicted probability of having difficulty paying their debt. On the threats associated with future interest rate hikes, our micro-simulation model indicates that low-income households are likely to see disproportionate increase in DSR. The rate increases will also threaten households who are `almost' financially vulnerable and the impacts on consumption growth will not be limited to the low-income groups.

Keywords: Household debt, economic stability, economic growth
JEL Classifications: D14, E21, C25

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1.Introduction

Currently at over 80% of GDP, Thailand's household debt figure is among the highest in the region and is well above average for a country in the upper-middle income range. Together with its meteoric rise in the past few years, household debt has been a subject of much discussion (see Figure 1). At household level, the high indebtedness among low-income households is particularly worrying. The debt-servicing ratio (DSR) for households in the first income quintile is almost 50% (see Figure 2). The household debt situation is certainly treated as a risk, which is often cited as a cause for concern for macroeconomic stability by policymakers and keen observers. Some tries to draw a correlation between household debt and the economic slowdown. However, those associations have largely been judgment calls.

Figure 1: Thailand's household debt has been rising fast and is now at the level of rich countries

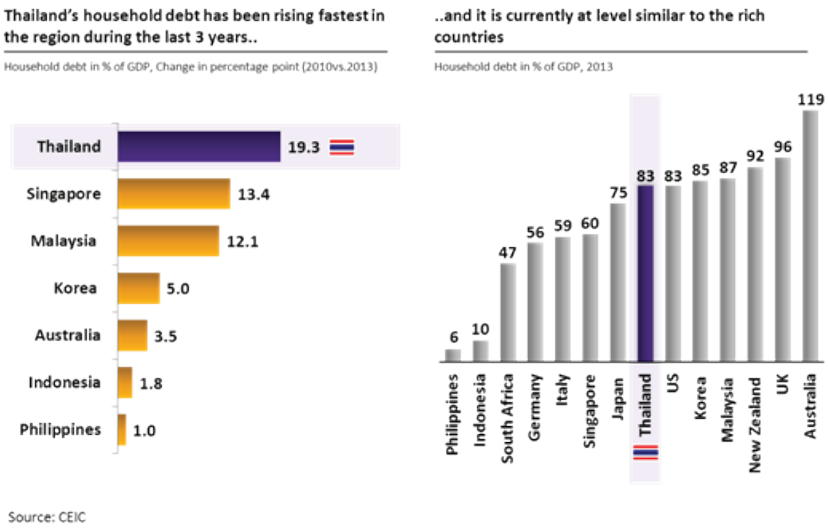
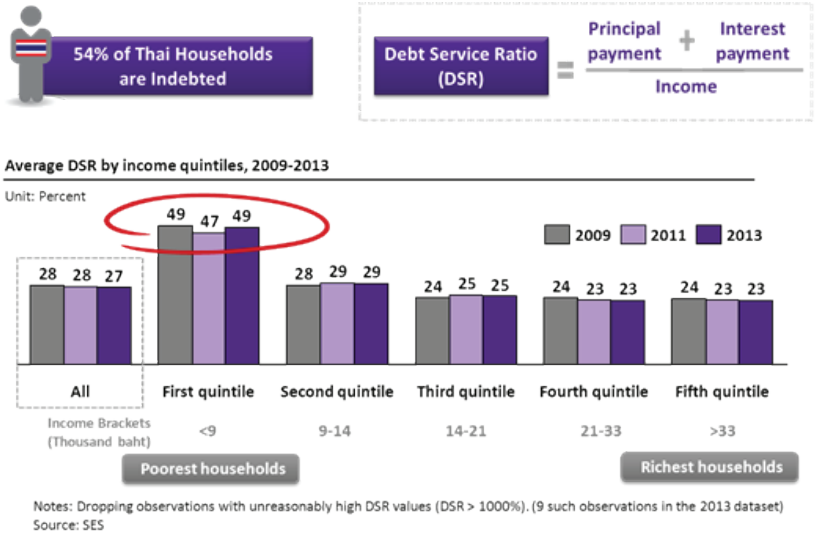


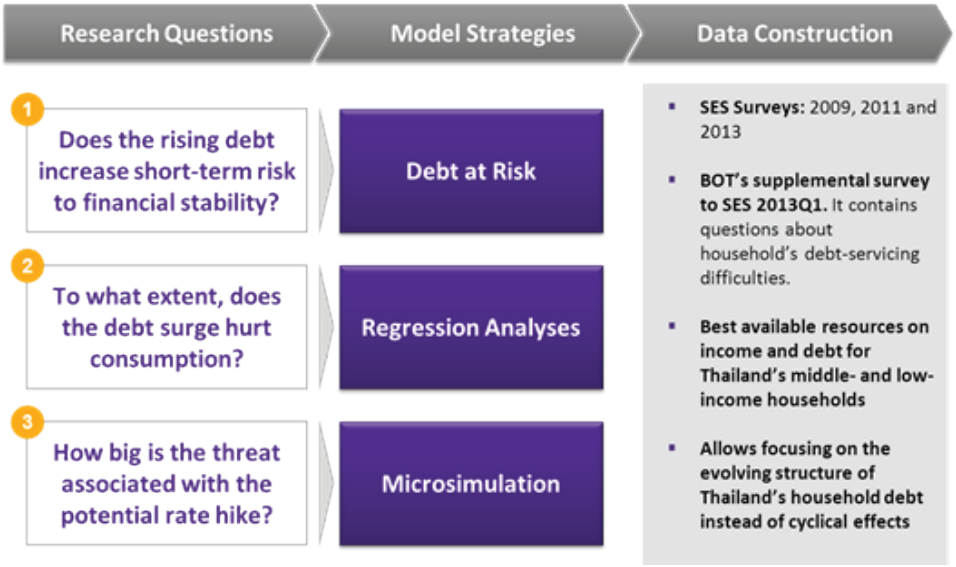
Figure 2: At household level, the high indebtedness among low-income households is particularly worrying



In this paper, we examine whether there is empirical ground to the conventional wisdom that the rising household debt has increased macroeconomic risks. Specifically, we investigate two main channels: short-term risks to financial stability and limitations on economic growth. We also explore the threats on our household debt from the potential increases in interest rate.

We use household level data from the biennial Socioeconomic surveys (SES) collected by the National Statistical Office for 2009, 2011and 2013, and a supplemental survey on the household balance sheet conducted on behalf of the Bank of Thailand (BOT) for 2013. While the SES surveys have well-known limitations about coverage of high-income households, they are best available resources on income and debt for middle- and low-income households[1]. The SES data also allow us to focus on the evolving structure of Thailand's household debt. In understanding the risks associated with household leverage, this is as important as keeping track of NPL and delinquency indicators which are heavily influenced by cyclical effects (see Figure 3).

Figure 3: Research Questions, Model Strategies and Data Construction



Source : Author's Illustration

For the financial stability channel, we examine whether the rise in household debt is concentrated in high-risk or low-risk pools of households in order to quantify whether the short-term risks to financial system has increased. To gauge those risks, we evaluate financial health of the stock of household debt by constructing an indicator based on the debt-servicing difficulties (DSD) probability and the outstanding debt. We call this indicator "Debt at Risk"; it measures how heavily debt is concentrated on households with the highest DSD probability.

We find that the Debt at Risk as percent of total debt has gradually declined from 23% in 2009 to 20% in 2013. This suggests that the recent rise in household debt has been concentrated in households with lower risk profiles. Consequently the recent surge in

[1] It is also important to note that, due to the data constraint, the DSR is measured using current income. This measure may overstate the debt problem for households that encounter temporary negative income shocks.

household debt has not been associated with an increase in short-term risk to financial stability.

To investigate the consumption channel, we use variation in growth of household debt burden across 776 districts (ampurs) from 2009 to 2011 to examine the effect of the debt buildup on consumption growth during the subsequent period. Findings from our regression analysis indicate that the lagged acceleration of debt burden has a statistically significant negative effect on non-durable consumption growth even after controlling for income growth.

A clear illustration of the impact of the rising debt on consumption can be seen by splitting the districts into three groups (tritiles) based on their increase in debt service ratio (DSR) from 2009 to 2011. For districts in the group with the smallest debt buildup, the income growth of 10% yields the average consumption growth of 7.8%. In contrast, for districts with the largest debt buildup, the income growth of 10% yields the average consumption growth of just 5.4%. This suggests that the overstretched balance sheet of households has started to weigh on essential spending. Thus, there is a cause for concern for Thailand's future growth.

An important question that follows is, at what level of DSR, has household leverage become financial burden to Thai households. We address that question using the BOT's supplemental survey which contains a critical question of whether households think they will have difficulty servicing debt (DSD) in the next period. This question allows us to understand the extent to which the debt burden has impacted their ability to service debt payments as well as restricted their general consumption.

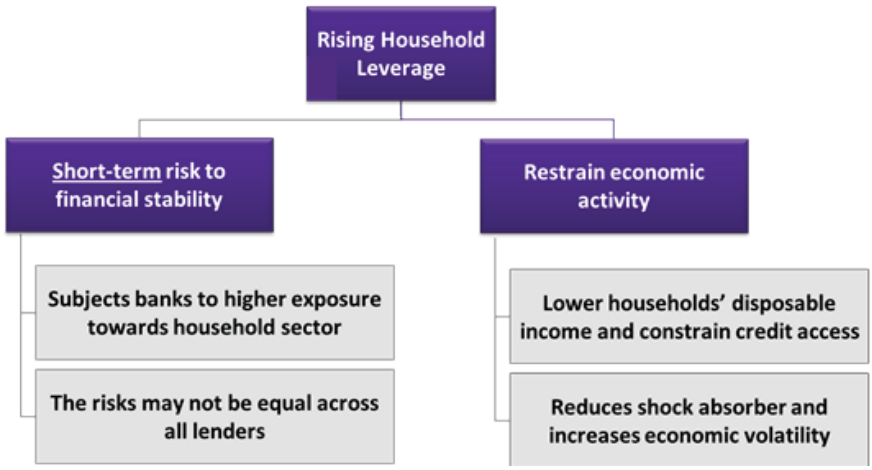
We find that households in all occupations exhibit a significant increase in their DSD probability when their DSR levels exceed 40%. What is striking is that, once the DSR exceeds that 40% threshold, the household's DSD probability is similar to the level of those households with highest DSR. We thus identify the DSR level at 40% as the level at which debt has become a significant financial burden to Thai households and classify households with DSR above 40% as financially vulnerable. For those financially vulnerable households, the debt burden has not only undermined their ability to service debt payments but also significantly restricted their general consumption. Additionally we develop a micro-simulation model to examine the impact of a rise in the lending rates, a scenario which is highly likely going forward. Our micro-simulation indicates that low-income households are likely to see disproportionate increase in DSR. The rate increases will also threaten households who are `almost' financially vulnerable and the impacts on consumption growth will not be limited to the low-income groups.

The remainder of this paper is organized as follows. The next section discusses rationale and surveys the literature on channels that household debt can affect macroeconomic risks. Sections3 and 4 introduce the empirical framework to quantify macroeconomic risks from the aforementioned channels. Section 5 extends the framework to examine the effects from a rise in the lending rates scenario and discusses policy implications. Section 6 concludes the study.

1. Channels through which household debt can hurt economic stability

We examine two main channels: short-term risks to financial stability and limitations on economic growth. For the financial stability channel, we examine whether the rise in household debt is concentrated in high-risk or low-risk pools of households in order to quantify whether the short-term risks have increased. For the growth channel, the focus is to find whether there is evidence that the rise in debt affected household's spending, which has implications for the country's future economic growth prospect (see Figure 4).

Figure 4: How could the large build-up of household debt be dangerous to the economy?



Source : Author's Illustration

Financial stability channel

Although an increase in household debt represents higher level of households' financial access and financial development, high level of household debt may lead to an economic vulnerability, financial instability and crisis. Financial stability is often the biggest concern of policymakers and observers amidst the rise of household debt due to the fact that its rise would not have been possible without actions of financial institutions providing the loans. The fact that the growth in household debt has far outpaced the GDP growth raises the question of whether financial institutions have become increasingly more risky structurally. Anecdotal evidence of more than a million people purchasing their first cars in 2012 under the government's first car buyer program raised eyebrows as it was clear from the beginning that some of those buyers appeared to be overstretched financially.

However, this evidence is not conclusive to judge whether the financial system has become riskier, because individual examples do not imply that the majority of debtors are also highly indebted. In addition, recent evidence of increasing delinquency during an economic downturn is not a proof that the financial system is inherently more risky as it is cyclical in nature. There needs to be a systematic way to measure the extent to which the debt are at risk of having repayment difficulty based on fundamental characteristics of the households, which is what we propose in this paper.

Financial stability channel in the literature

During 2000 – 2010, many countries in Asia and the pacific such as Korea Malaysia and Australia witnessed the high growth in household debt and the increased share of household loans to total loans of financial institutions. Common key factors which contributed to the expansion of household debt were 1) an increase in households' demand for loan from high economic growth, low interest rate and urbanization; 2) an increase in the availability of household lending of financial institutions from financial innovations and technological advancements; and 3) government policies to promote household consumption and borrowing (Ma, Remolona and Shim, 2009).

Debelle (2004) concludes that the greater households' indebtedness has important macroeconomic implications. High level of debt causes households to be more

sensitivity to the movement of interest rate, particularly with income shock. As household debt is commonly related to mortgage loan, increased indebtedness means that there is more exposure to housing prices. Furthermore, if household debt is associated with a housing bubble, the drop in housing prices after the bubble burst will decrease households' equity value, confidence, and consumption.

The case of Korea's credit card lending distress in 2003 showed that a great boom in credit card lending led to a painful bust, with households' solvency risk, and deteriorations of asset quality and liquidity of financial institutions. This vulnerability systemically affected the banking sector and the financial market. At last, it led to the downturn of the real economy (Kang and Ma, 2007). The experience corresponds with Ghani (2009)'s study on household indebtedness and its implications for financial stability in Malaysia, which shows a positive relationship between the level of households' NPL with households' indebtedness and interest rate. Households' increasing indebtedness is associated with a higher probability of default. In addition, an interest rate hike cause an increase in the likelihood of delinquencies as a higher interest rate results in higher debt service burden in terms of interest payment.

There are studies that try to develop warning indicators. Berge and Boye (2007), Rinaldi and Sanchis-Arellano (2006) and May and Tudela (2005) define the benchmark of non-performing loans (NPL) and the predicted value of NPL. If NPL predicted value is above the benchmark, there is a signal of unsustainable debt. These studies are in line with Drehmann and Juselius (2012) who use a debt service cost of private sector as an early warning signal of banking crisis. In case of household sector, they use the ratio of household debt service cost, which includes interest and principal payment, to household income.

In case of Thailand, the past literature (Kiatipong et al., 2007 and Tientip, 2009) does not show the significant systemic risk from household indebtedness in those periods. Vulnerable households are households with low income because they have low financial literacy, financial access limit and heavy debt service burden.

Consumption channel

A key driver of consumption spending and household debt in the past few years has been purchases of durable goods, such as automobiles. The rush to purchase durable goods was in response to the temporary drop in the purchase price induced by government's policy. Given the longevity of durable goods, it is therefore not a surprise to see the sharp drop in purchases of these items recently and to expect a subdued demand environment for a while.

The real question is whether the debt service obligations created by previous purchases of those durable goods or by other reasons have become a significant burden in the households' budget constraint. If this is the case, households' future consumption spending will be impacted not only because there is less demand for durable goods, but also because households are increasingly financially-constrained. Because a tight budget constraint can potentially impact spending on essential items, the real risk is whether we have reached the point where households' consumption of non-durable goods is affected. This can potentially have far greater impact on the economy as consumption of non-durable goods account for as much as 60% of total consumption.

Consumption channel in the literature

IMF (2012) conducts the empirical study of 24 OECD countries for the period 1980-2011 to see the impact of the global financial crisis. Countries are separated into

high-debt and low-debt countries, where high-debt countries had an above-median rate of increase in household debt-to-income ratio prior to the global financial crisis, and low-debt countries had a rate of change in household debt-to-income ratio that was below the median value. The results show that high-debt countries suffer more from the slowdown than low-debt countries in case of a bubble burst. Moreover, there is a significant positive relationship between high household debt and a magnitude of consumption slump in the recession period. It is also clear that high level of household debt will be a constraint for consumption and economic recovery in the next period. This empirical study is consistent with various other findings. Mian et al. (2012), for instance, found that weakness in household balance sheet is associated with serious job losses during Great Recession in US. In case of Korea, Chung (2009) claims that a rapid growth of Korea's household debt in the early 2000s led to heavy debt service burden in the household sector.Moreover, the surge of household debt caused a fall in household savings rate and then the more volatility of private consumption.

To explain how household debt can affect aggregate demand and amplify an economic slowdown. Household consumption decision can be affected by high level of household debt in many ways through 1) debt service cost as interest rate shock 2) borrowing constraint imposed by financial institutions and 3) households' perception about how the debt may cause an impact on theirlifetime smooth-consumption ability (Intertemporal consumption and saving). Filardo (2009) adds household debt into a benchmark monetary policy model for the purpose that household debt may play an active role as a driver of the aggregate demand.

Liquidity constraint in credit market can amplify macroeconomic shock which household with high level of debt may play an important role. Higher household debt levelcan ruin net worth of household sector and therefore the cost of borrowing hike. Debt level would increase the incidence of credit rationing. In this way, household debtcan affect aggregate consumption and therefore impact business cycle dynamics. Eventually, monetary policy response will take into account.

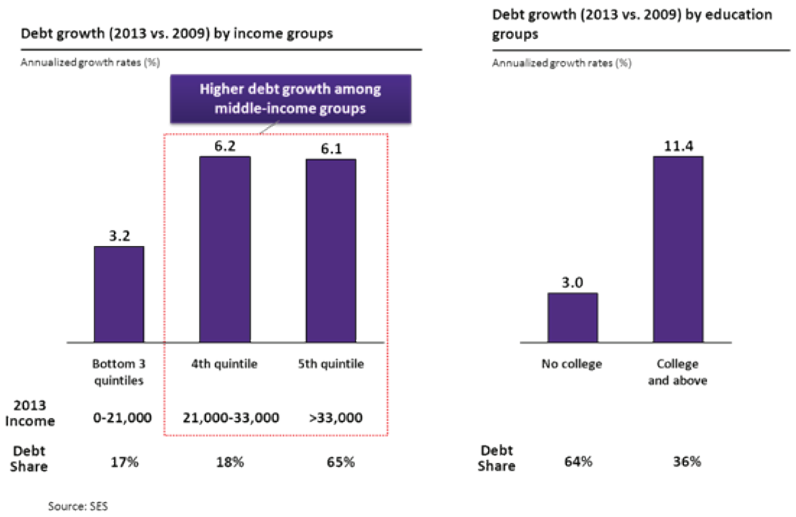
Fear of credit crunch is another way that high level of household debt can impact consumption. Households with high level of debt sometimes fear that they will be asked to repay their debt and cannot get more credit in the future. This fear leads to a drop in household consumption. Weale (2012) illustrates this phenomenon by showing that if the chance of having a household credit crunch increases from 10% to 80%, aggregate consumption will reduce by 1.7%.

2. Short-term Risks to Financial Stability

The rising household debt subjects both formal and informal lenders to higher exposure towards household sector. If the ability of households to service their debt is in doubt, loan losses could be significant. This will increase the fragility of the financial system.

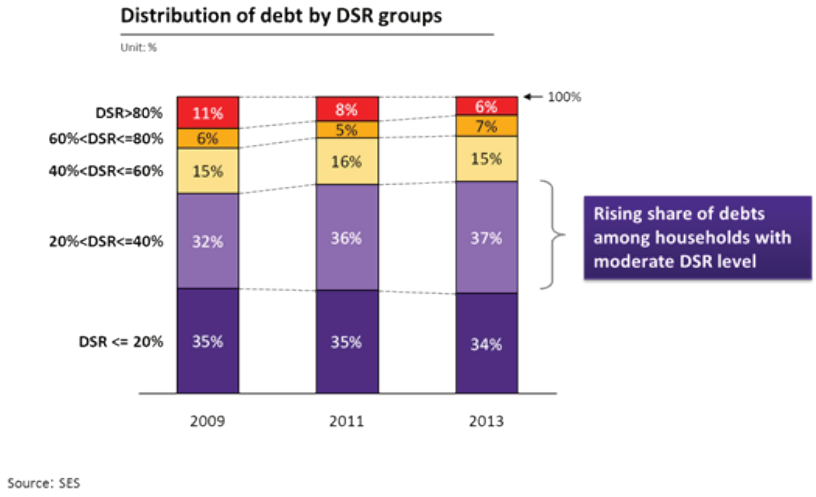
The key to gauge the short-term risks to financial stability is distribution of the debt. The short-term risks will be higher if the debt is more concentrated among risky households. During the past four years, we have seen higher credit expansion among middle-income household who are perceived as having low risks. In particular, the debt growth has been far greateramong households with higher income or higher education (see Figure 5).

Figure 5: Debt growth has been higher among groups perceived as having lower risks



This expansion of credit among middle-income groups also results in increasing shares of those with moderate debt-servicing burden. The share of debt among households with DSR between 20% and 40% has risen from 32% in 2009 to 37% in 2013 (see Figure 6).

Figure 6: The expansion of credit among middle-income groups also results in increasing shares of those with moderate debt-servicing burden



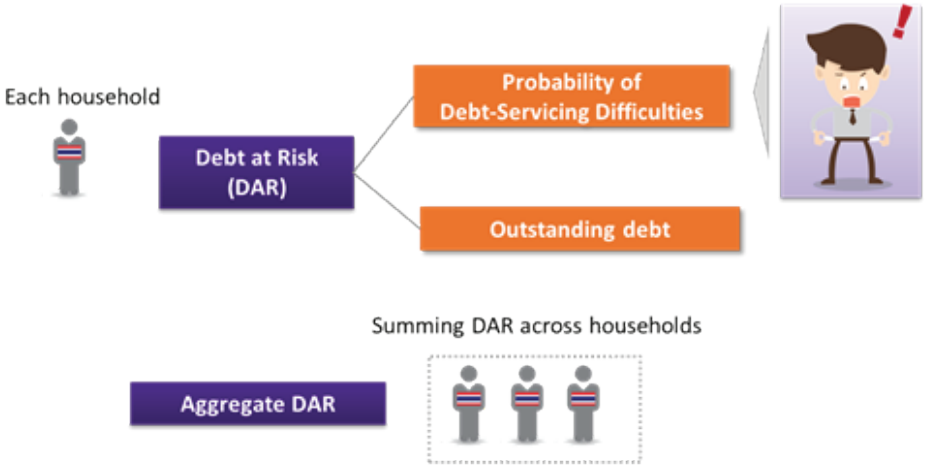
To summarize the financial health of our stock of household debt, we construct an indicator based on the debt-servicing difficulties (DSD) probability and the outstanding debt. We call this indicator "Debt at Risk".[2] Since the standard SES surveys do not contain the debt-servicing difficulty question, we apply the probit coefficients of the DSD probability model from the 2013Q1 BOT-NSO survey to each household in the standard 2009, 2011 and 2013 SES surveys.[3] We then compute the DSD probability for each

[2] The Debt at Risk indicator is introduced by May and Tulada (2005).

household. The Debt at Risk measure is calculated as the product of the DSD probability and the debt level.

An aggregate value of Debt at Risk is obtained by summing the Debt at Risk value across all households. It indicates how heavily debt is concentrated on households with the highest DSD probability (see Figure 7).

Figure 7: The "Debt at Risk" measure summarizes the health of our stock of household debt



1 Debt concentrated among high-risk households

	Debt (baht)	Prob.	Debt at Risk (baht)
A	80	50%	40
B	20	10%	2
Debt at Risk (% of total)			42%

2 Debt concentrated among low-risk households

	Debt (baht)	Prob.	Debt at Risk (baht)
C	20	50%	10
D	80	10%	8
Debt at Risk (% of total)			18%

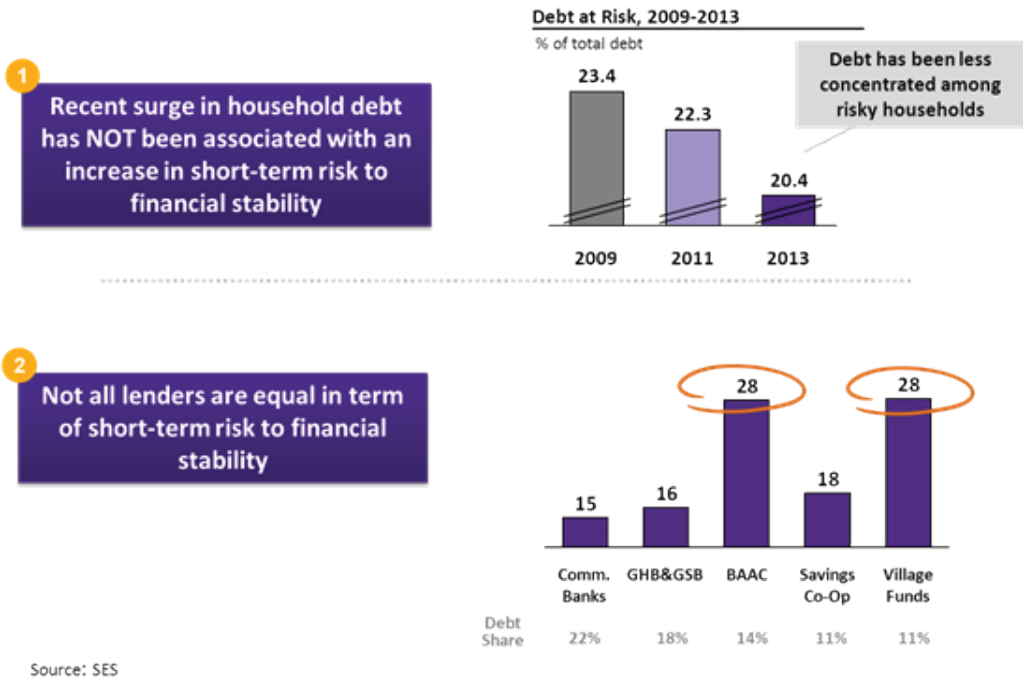
Source : Author's Illustration

We find that aggregate Debt at Risk has declined gradually since 2009. In percent of total debt, it has fallen from 23.4% in 2009 to 20.4%in 2013 (see Figure 8). The rise in household debt has been more than compensated for by declining DSD probabilities. This suggests that the household debt has been less concentrated among high-risk households. The result implies that the recent surge in household debt has not been associated with increase in risk to financial stability.

Another important finding is that not all lenders are equal in term of those short-term risks. The declines in Debt at Risk are not equal across financial institutions. Bank for Agricultural and Agricultural Co-Operatives (BAAC) and village funds pose significantly higher short-term risks than other institutions as they are exposed to relatively fragile households (see Figure 8). This warrants close attention by related policymakers.

[3] The DSD probability model is discussed in the next section. We re-estimate the DSD probability using regressors that are available in both the 2013Q1 BOT&NSO survey and the standard SES surveys.

Figure 8: Aggregate Debt at Risk has been declining gradually since 2009



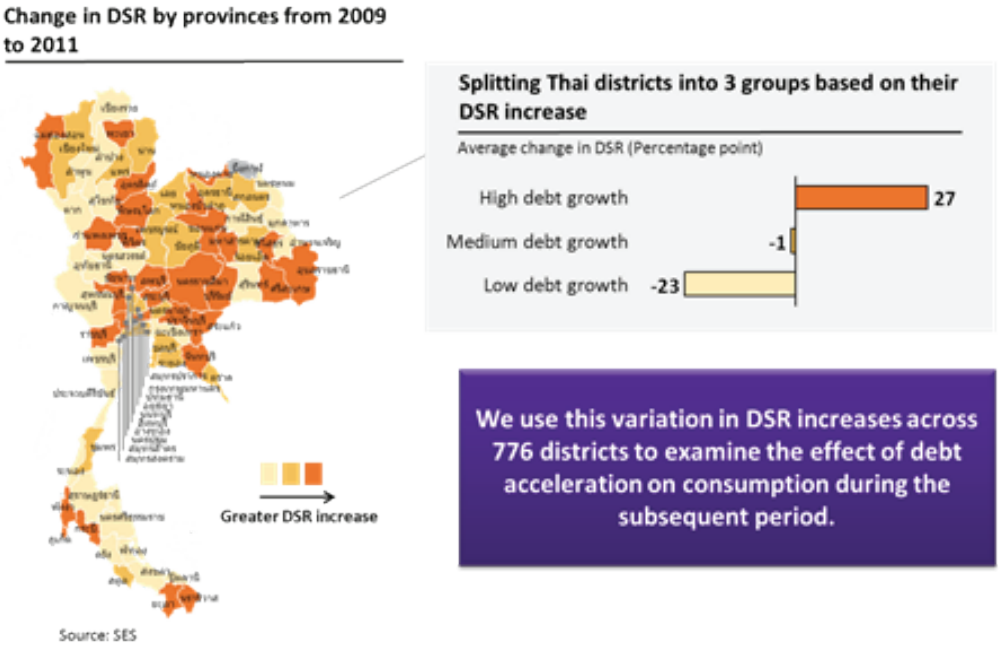
3. Limitations to Economic Growth

The high level of indebtedness constrains households' access to credit and limits their ability to smooth consumption over time. This reduces the role of domestic demand as a shock absorber and increases economic volatility. It also imposes pressure on monetary policy since an interest rate hike potentially exposes households to higher delinquency probability.

Our microeconomic analysis of Thai districts (Ampurs) shows that the recent weakness in consumption is closely related to the acceleration of household debt.[4] Specifically, we use variation in growth of household debt burden growth across 776 districts from 2009 to 2011 to examine the effect of that rising debt on consumption growth during the subsequent period (see Figure 9).

[4] Ideally we would like to examine the consumption by households in the panel settings. Due to the data constraint, we look instead at the average consumption by districts. Examining the district-level data allows us to relate the changes in consumption to the changes in debt over time.

Figure 9: Thailand experienced a wide variation of debt growth from 2009 to 2011



Using SES surveys from 2009 to 2013, we estimate the following reduced form equation:

$$\Delta \log(c_t) = \beta_0 + \beta_1 \Delta d_{t-1} + \beta_2 \Delta \log(y_t) + \beta_3 central + \beta_4 north + \beta_5 northeast + \beta_6 south + \varepsilon \quad \text{(Eq.1)},$$

where $\Delta \log(c_t)$ represents growth in total non-durable goods consumption from 2011 to 2013, Δd_{11} represents change in average DSR from 2009 to 2011, $\Delta \log(y_t)$ represents growth in total income from 2011 to 2013, and central, north, northeast and south are region dummy variables.[5]

Table 1: Summary of Regression result for the consumption growth estimation
Dependent variable: Non-durable consumption growth

Variable	Coefficient	Robust S.E.	p-value
Lagged DSR increase	-0.05	0.02	0.047
Income growth	0.73	0.03	0.000
Central	-0.44	0.06	0.000
North	-0.53	0.06	0.000
Northeast	-0.41	0.06	0.000

[5] We define non-durable consumption as spending on items that has an expected lifespan of three years or less. This includes, for example, food, clothing and utilities. On the contrary, durable consumption good is defined as spending on items that has an expected lifespan of greater than three years.

Variable	Coefficient	Robust S.E.	p-value
South	-0.42	0.07	0.000
Constant	0.42	0.06	0.000
Number of districts		776	
Link test		p-value = 0.211	
RESET test		p-value = 0.564	

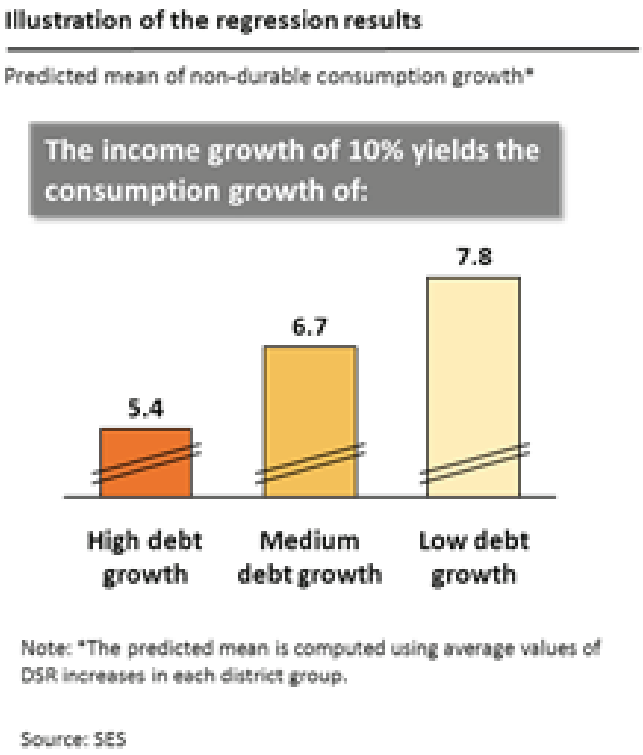
Note: Standard errors are corrected for heteroskedasticity using Robust standard errors. Data are unweighted.
Source : Author's Calculation

Results of the estimation of equation 1 are reported in Table 1. All coefficients have expected signs. The coefficient on lagged DSR increase is negative and statistically significant at 0.05 level. It implies that, holding income growth and region variables constant, an increase in DSR by 10 percentage points lead to a reduction in nondurable consumption growth by 0.5 percentage point. The coefficient on contemporary income growth is also large and statistically significant. Both link and RESET tests suggest there is no evidence of model misspecification.[6] These results suggest that the lagged acceleration of debt burden represents the key impediment to consumption growth even after controlling for income growth.

To illustrate the impact of the rising debt on consumption, we split the 776 districts into tritiles based on their increase in DSR from 2009 to 2011. Thai districts experienced wide variation of DSR changes during that period. Districts in the tritile with the largest increase in DSR experienced an average increase in DSR of 27 percentage points, while districts in the other two tritiles experienced an average decline of 0.1 and 23 percentage points respectively. We then compute predicted mean of non-durable consumption growth average values of DSR increases in each district group. For districts in the trititle with the lowest DSR increase during 2009-11, the income growth of 10% yields the average consumption growth of 7.8%. In contrast, for districts with the largest DSR increase during 2009-11, the income growth of 10% yields the average consumption growth of just 5.4% (see Figure 10).

[6] As a robustness check, we also replace the non-durable consumption growth with the durable consumption growth. Using the durable consumption growth as a dependent variable allows us to capture the effect of debt on economic activities other than purchases of non-durable goods (for example, investment in business equipments). The findings are consistent with that reported in Table 1. Specifically, the coefficient on lagged DSR increase is -0.06 and statistically significant at 0.05 level.

Figure 10: The acceleration of debt burden represents the key impediment to consumption growth



Note: *The predicted mean is computed using average values of DSR increases in each district group.

Source: SES

The result suggests that overstretched balanced sheets of households have started to cripple consumption. This is because leveraged households have become financially constrained, meaning that they can no longer get credit to finance consumption, or that the debt service burden has taken up a larger chunk of their available consumption budget. On top of that, financially constrained households could reduce consumption due to worries about debt service difficulty.

To see whether households have already considered themselves having significant financial burden, we use the National Statistical Office's Household Socio-economic Survey (SES) which is a field survey which collects the data from the sample households (52,000 households per annum). The household consumption data is collected every year, whereas, household income and balance sheet data is collected every 2 years.

The Bank of Thailand attached the supplemental survey with the main SES survey in 2013. This survey included balance sheet condition, financial access and literacy questions. The sample of this survey is 14,000 households. The survey contains a critical question of whether households think they will have difficulty servicing the debt in the next period (called DSD hereafter). Specifically, it asks whether the household is anxious about its ability to service its next debt payment. The household then provides a yes or no answer. This question allows us to understand the extent to which the debt burden has impacted their ability to service debt payments as well as restricted their general consumption.

Among indebted households, approximately 26% think that they will have difficulty servicing the debt in the next period. The average DSR among those with DSD is 36.2%, a bit higher than the average DSR of those without (26.7%). As expected, indebted households with DSD appears to be more financially vulnerable than those without DSD. For example, relative to those without DSD, households with DSD have relatively less average liquid asset (about 65,050 baht compared to 194,407 baht among those without DSD) and smaller average ratio of liquid assets (7.7% compared to 12.0% among those without). In addition, households with DSD have relatively worse credit history (9.7% have experienced a loan request rejection compared to 4.6% of those without).

We estimate the probability of households having debt-servicing difficulty (DSD probability) using the following equation:

$$I^* = \alpha_0 + \alpha_1 DSRg2 + \alpha_2 DSRg3 + \alpha_3 DSRg3 + \alpha_4 DSRg4 + X\alpha_5 + u \qquad \text{(Eq.2)}$$

where I^* is a latent indicator of the propensity to have DSD, *DSRg2* is a group dummy variable for having 20%<=DSR<40%, *DSRg3* is a group dummy variable for having 40%<=DSR<60%, *DSRg4* is a group dummy variable for having 60%<=DSR<80%, *DSRg5* is a group dummy variable for having DSR>=80%, and X is a vector of other control variables. The control variables include assets, occupation, education, financial discipline, past credit behavior, and demographic information. Note that liquid assets include cash, bank accounts, bonds and stocks. A probit model is used to estimate Equation 2. We use an unweighted regression in the base result.[7]

Table 2: Summary of Probit regression result
for the probability of debt-servicing difficulty estimation

Variable	Marginal Effects	Robust S.E.	p-value
20%<=DSR<40%	0.05	0.01	0.00
40%<=DSR<60%	0.15	0.03	0.00
60%<=DSR<80%	0.13	0.04	0.00
DSR>=80%	0.17	0.04	0.00
Log(Asset)	-0.04	0.01	0.00
Liquid asset/Total asset	-0.27	0.05	0.00
Agriculture	0.03	0.02	0.10
Non-agri business	0.04	0.02	0.02
Retired	0.02	0.02	0.30
Household size	0.01	0.00	0.00
Central	0.04	0.03	0.15
North	0.05	0.03	0.16
Northeast	0.09	0.03	0.00
South	0.04	0.03	0.21

[7] Deaton (1997) discusses issues that may arise in weighted regression analyses using survey datasets.

Variable	Marginal Effects	Robust S.E.	p-value
Age	0.00	0.00	0.14
College educated	-0.03	0.02	0.14
Had loan request rejected	0.10	0.03	0.00
Had debt-servicing difficulty	0.41	0.02	0.00
Savings adequate for 1 month	0.12	0.02	0.00
Savings adequate for 2-3 months	0.07	0.02	0.00
Expect worse household finance over next year	0.17	0.02	0.00
Secure income perception	-0.05	0.01	0.00
Do financial accounting	-0.06	0.03	0.02
Number of households	5,629		
Link test	p-value = 0.163		
RESET test	p-value = 0.122		

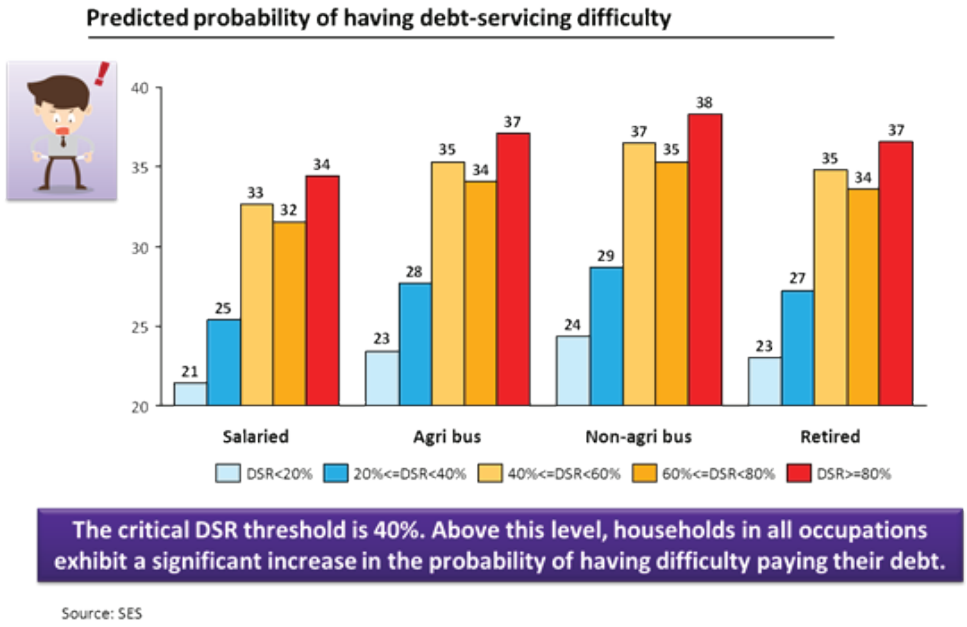
Note: Standard errors are corrected for heteroskedasticity using Robust standard errors. Data are unweighted.
Source : Author's Calculation

Our results indicate that higher DSR levels are significantly and positively related to higher likelihood of having DSD. High values of household assets and ratio of liquid asset to total assets are negatively correlated with the delinquency anxiousness incidence. Coefficients on the other control variables generally conform to expectations. Both link and RESET tests suggest that there is no evidence of model misspecification.

We also evaluate the goodness of fit for the model using Hosmer-Lemeshow specification test, which compares the sample frequency of the dependent variable with the fitted probability within subgroups of observations. The groups are based on quantiles of the ordered predicted probabilities. The null hypothesis is that the two are equal. The outcomes again do not indicate misspecification. Examining the percentage of correctly classified observations, we find that the percentage of correctly specified values is 82.49.

Next we use the estimated probability from the DSD model to identify the DSR level at which debt has become a significant financial burden to Thai households. Figure 11 illustrates the predicted probabilities for households in different occupations across the DSR groups. We find that, holding other variables constant at their means, households in all occupations exhibit a significant increase in the DSD probability when their DSR levels exceed 40%. What is striking is that, once the DSR exceeds that 40% threshold, the household's debt anxiousness probability is similar to the level of those households with highest DSR. We therefore classify households with DSR above 40% as financially vulnerable.

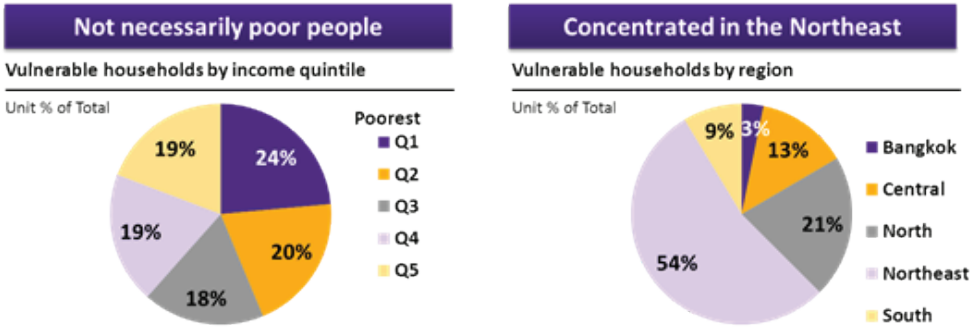
Figure 11: When is household leverage financial burden to Thai households?



Source: SES

Those financially vulnerable households account for about 18% of all indebted households in 2013 and they are concentrated geographically. Figure 12 shows that 54% of financially vulnerable households are in the Northeast and 21% are in the North. Furthermore, we find that they are not necessarily those with low income. Figure 12 reveals that 44% of financially vulnerable households are in the bottom two income quintiles; the rest are equally distributed in the top 3 income quintiles. They also have higher share of fragile income, and less liquidity asset cushion than households that are not financially vulnerable.

Figure 12: Who are these financially vulnerable households?



Have less liquid asset cushion but more fragile income

	Vulnerable	Not Vulnerable
Median liquid asset coverage	4.8	16.8
Share of fragile income	73%	58%

Source: SES

4. Risks associated with interest rate increases and Policy Implications

Risks associated with potential interest rate hikes

An important threat over the next several years is the rise in global interest rates. The question is: how worried should we be on household debt when the borrowing cost rises?

We perform a micro-simulation that will help assess the impact of the rate increase on households' financial health (summarized by DSR) and identify the pocket of household sector that will be most vulnerable to the rate hike. The micro-simulation is illustrative in nature and has several major limitations. One of them is that we assume the share of indebted households remains constant throughout the projection period. We also make certain assumptions on types of debt that are subject to variable interest rate. Despite those limitations, the simulation provides a useful framework that allows us to gauge the exposure of household debt to the economic shocks.

In our micro-simulation framework, the changes in DSR depend on movements in income and debt. The framework consequently consists of three main elements: 1) Income growth, 2) Debt Growth and 3) Interest rate.

For income growth, we divide households into 5 income quintiles. We assume average income growth for each group to be consistent with Bank of Thailand's projected per capita GDP growth and historical income growth of SES households. By assuming the variance of income growth to differ across income classes, we also allow the income growth to be heterogeneous within income groups.

Determining how debt responds to movements in economic variables is a little challenging since the SES datasets are cross sectional. We create a pseudo panel dataset by constructing growth rates for a cluster for households having similar characteristics. Our criteria for grouping households are as follow:

- Education: 1) primary and no education, 2) secondary and post-secondary and 3) college and above.
- Age: 1) Age<=30, 2) 30<Age<=45, 3) 45<Age<=60 and 4) 60<Age.
- Occupation status: 1) Self-employed and 2) Non self-employed.
- Location: 1) Municipal and 2) Non-municipal.

Using the 48 households groups as just described, we estimate equations that determine debt growth as a function of income growth. The results indicate a positive and statistically significant relationship between debt growth and income growth. Combining with our assumption on income growth, we apply the estimated relationship to each household to simulate the change in debt.

For the interest rate element, we assume each household pays an effective interest rate which is a sum of the standard interest rate (i.e., MRR) and household risk premium. We obtain the information on household risk premium from the BOT-NSO survey in 2013Q1 (See Figure 13). We assume the risk premiums remain constant throughout the projection period. We assume mortgage, consumption debt and a fraction of agricultural debt that is not owed to BAAC are subject to fixed interest rate. All other debt, primarily BAAC agricultural debt and business debt, are subject to variable interest rate.

Figure 13: Average interest rate by debt types

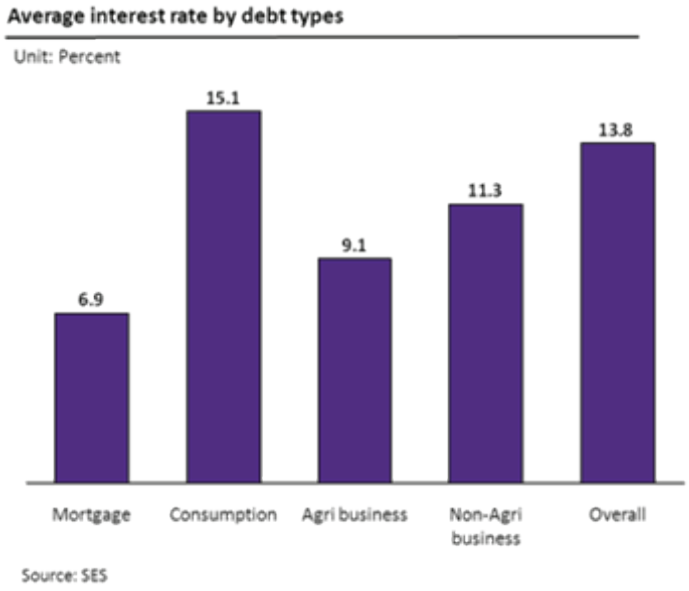
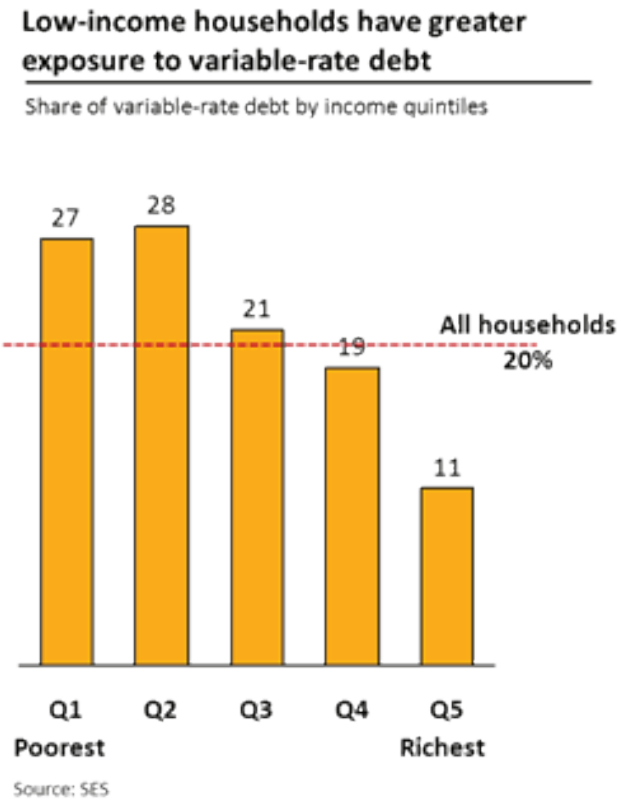


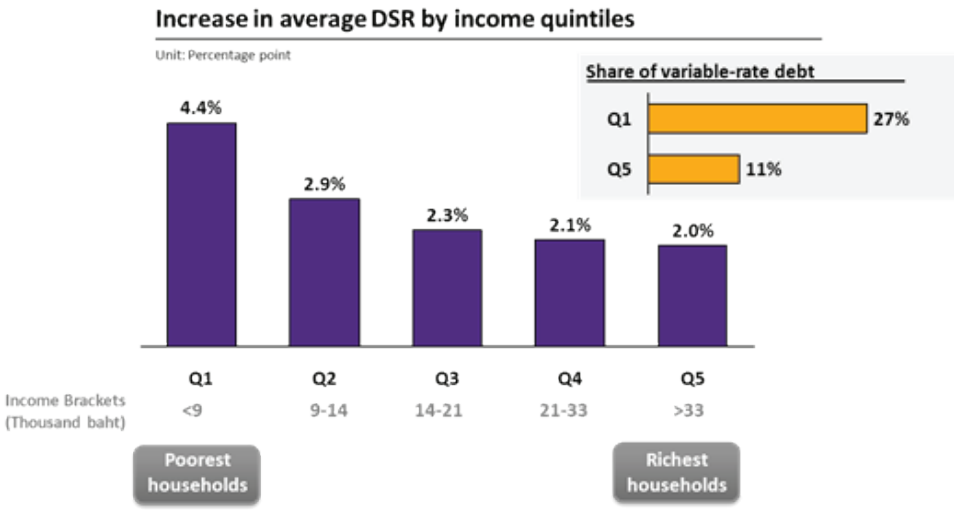
Figure 14reports the distribution of variable- and fixed-rate debt across income groups. Households in the low income groups are relatively exposed to variable interest rate debt. The share of variable rate debt for the low income groups are almost 30%, while the share for the top income group is just 11%.

Figure 14: Low-income households have greater exposure to variable-rate debt



To evaluate the exposure of household debt to the interest rate hike, we assume that the MRR remains at 8% in 2014 before rising to 9% in 2015. Our microsimulation indicates that low-income households will be relatively troubled by the potential rate increase. Households in the bottom income quintile will see their average DSR rising by 4.4 percentage point, while the increase in average DSR will be just about 2 percentage point in the top group (see Figure 15). This finding is mainly because low-income households have greater exposure to variable-rate debt.

Figure 15: Our microsimulation indicates low-income households will be more burdened by the interest rate hike



Notes: 1. The microsimulation uses 2013Q1 SES observations as the base dataset.
2. Indebted households only
Source: SES

The rate hike is likely to weigh on households' consumption since it will threaten households who are "almost" financially vulnerable. Those "almost" financially vulnerable households are those with DSR between 35% and 40% and are more prevalent in the top income groups (see Figure 16). As DSR exceeds the 40% threshold, households are significantly more likely to become worried about their debt-servicing ability and this will have direct impact on their general consumption. Figure 17 shows that the rate hike will increase the share of financially vulnerable households by 2.6% on average, with the effects not limiting to the poor income groups.

Figure 16: Almost vulnerable households are more prevalent in top income quintiles

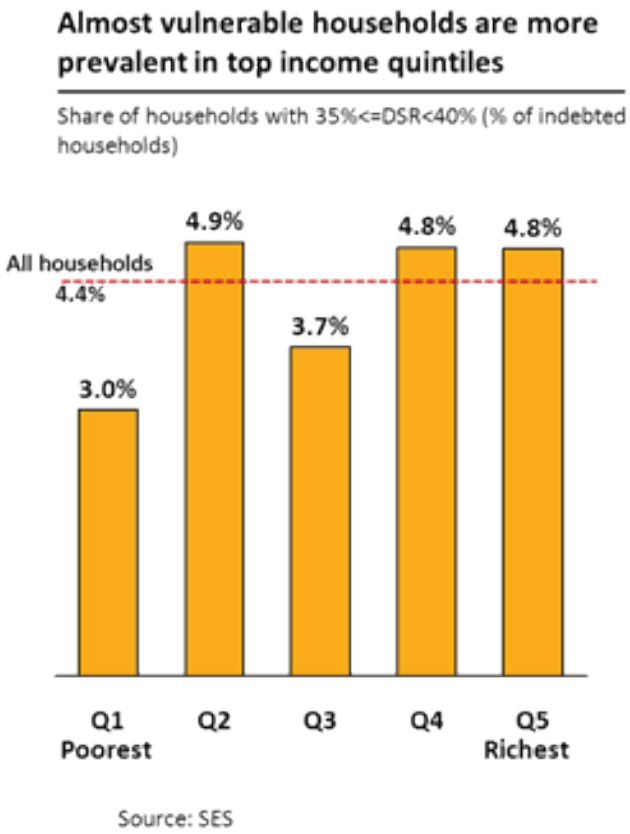
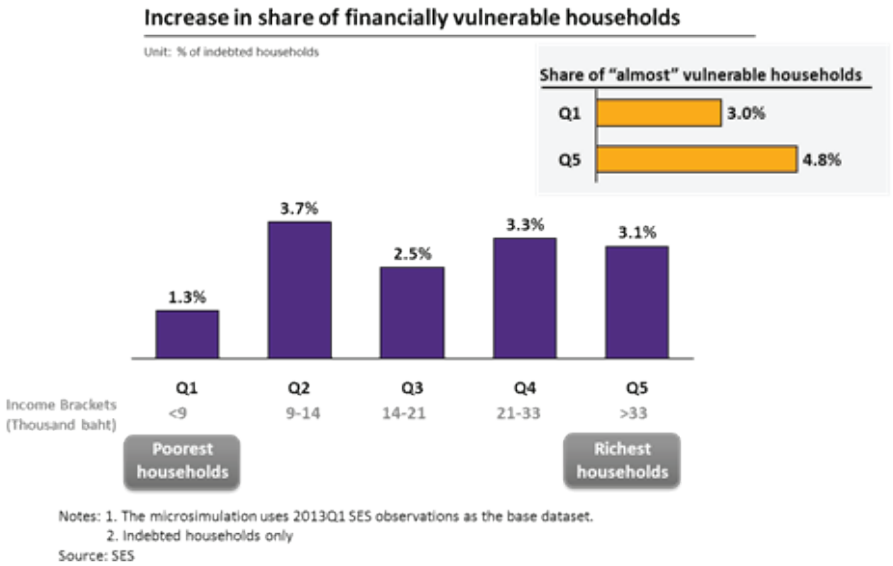


Figure 17: The rate hike will also threaten households who are "almost" financially vulnerable to begin with



Policy implications

1) Consumption cannot be the main engine of growth for the time being.

There is evidence that debt buildups in the past have a negative impact on future consumption growth. This evidence can be viewed as the economy going through a self-correction period, but it also says that consumption cannot be relied on as the main engine of growth for the time being. Growth from the demand side has to come from other engines, which can be investment, public spending, or exports. Government policy to focus on infrastructure investment is a good starting point.

2) Economic growth will likely be more sensitive to changes in interest rates going forward.

With rising interest rates, more people will experience increased debt burden, especially higher-income households who tend to have more variable-rate loans. Because they account for the majority of the country's consumption spending, they are the group that will influence the growth outlook. Thus, it will be important to monitor the debt burden not only on low income households, but also high income households. Based on findings in this paper, we think households with DSR beyond 40% should be monitored.

3) Policy should adjust to having highly leveraged households in the economy.

First, it is important to be vigilant on debt deflation. Debt deflation occurs when falling wages and prices causes debt repayment, which is fixed in nominal term, to take a larger share of income, thereby lowering spending, and leading to even further fall in wages and prices in a vicious cycle. The threat of debt deflation was one of the reasons for aggressive monetary policy responses in the US and Europe to falling inflation.

Second, there is room to help reduce households' downside risks. These risks are from, for example, medical care costs on health related issues, debt burden from deceased family members, liabilities from accidents, or damages to properties from natural disasters. One way to help is to increase access to private insurance products already existed in the market. Government should step in to help where the market is missing.

Third, it is necessary to increase households' awareness of their own financial situation. Given today's modern technology and the popularity of smartphones, households should be able to have real-time information of their balance sheet to make important financial decisions. The same tool can be used to help with planning and budgeting. To make this happen, standardizing information flows from different financial institutions is a first step. Utilizing technologies to enhance financial awareness should be done in addition to attempts to further increase financial literacy.

Fourth, economic buffers have to be carefully managed. With households not being able to leverage much further, fiscal space becomes the ultimate shock absorber for the economy. This means the remaining fiscal space must be carefully managed.

5. Conclusion

In this article, we develop a framework to assess the impact of the rising household debt on macroeconomic stability. Using household-level data, we find that the recent surge in household debt has not been associated with an increase in short-term risk to financial stability. Our microanalysis of Thai districts, however, has shown that the debt build up represented the key impediment to consumption growth. To monitor the level of DSR that could threaten households' consumption, we establish the critical DSR threshold of 40%. Above this level, households in all occupations are significantly more likely to become worried about their debt-servicing ability and this will have direct impact on their general consumption. On the threats associated with future interest rate hikes, our micro-simulation model indicates that low-income households are likely to see disproportionate increase in DSR. The rate increases will also threaten households who are `almost' financially vulnerable and the impacts on consumption growth will not be limited to the low-income groups.

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