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A Brief Note on Thailand Household Debt Dynamics, Fisher Effects, and Monetary Policy Transmission

by

Teerapap Pangsapa, Thanaphol Kongphalee, Maneerat Gongsiang

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A Brief Note on Thailand Household Debt Dynamics, Fisher Effects, and Monetary Policy Transmission

Teerapap Pangsapa, Thanaphol Kongphalee, and Maneerat Gongsiang*

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Abstract

This paper examines the complex relationship between monetary policy and household debt dynamics in Thailand. Using a household debt law of motion framework, we decompose changes in the household debt-to-GDP ratio into two key components: net new borrowing and the Fisher effect. Our analysis reveals that monetary policy creates significant intertemporal trade-offs in managing household debt. While monetary easing reduces the debt service burden in the short term, it simultaneously stimulates new borrowing, potentially leading to higher debt accumulation over time. Employing both local projection methods and Bayesian vector autoregression models, we further demonstrate that these policy effects are state-dependent. Monetary policy's long-term trade-off is substantially weaker during high-leverage periods compared to low-leverage environments, suggesting potential policy benefits in high-debt contexts where new borrowing is already constrained. Our results highlight the importance of considering credit cycle conditions when implementing monetary policy.

JEL classification: E52, G50

Keywords: household debt, credit cycle, monetary policy

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1 Introduction

The rising trajectory of household debt ratios has become a pressing concern for policymakers worldwide. To highlight the gravity of the situation, the household debt-to-GDP ratios have surged to 80.5 percent in advanced economies and 54.1 percent in emerging markets. In several emerging market economies, household debt-to-GDP ratios have escalated to levels on par with those observed in advanced economies. Notably, South Korea reached a peak of 98.7 percent, Hong Kong 96.4 percent, and Malaysia 76.3 percent in the aftermath of the COVID-19 pandemic. Concurrently, Thailand experienced a significant increase in its ratio, reaching 95.5 percent of GDP. What are the factors contributing to the accumulation of household debt remains an unsettling question. Chan (2020), Kang (2022), and Dumitrescu et al. (2022) have examined the drivers of household debt accumulation, highlighting variations across countries and time periods. These factors include policy-induced changes, macro economic shocks or crises, as well as financial deepening and economic development.

It is well-established that the accumulation of household debt is a critical factor in shaping macroeconomic outcomes. High household indebtedness or debt overhang can exacerbate recessions due to externalities affecting both pecuniary aspects and aggregate demand channel. Many studies reveal that economies with elevated levels of household debt are often associated with more severe macroeconomic downturns and increased financial risks (Jordà et al., 2020; Mian and Sufi, 2012). Moreover, research indicates that when debt levels are high, the responsiveness of aggregate demand to monetary policy shocks is reduced, thus weakening the effectiveness of monetary policy in stimulating economic activity during crises (Alpanda et al., 2019; van den End et al., 2020). Among the tools available to address household debt, monetary policy stands out as a key tool available to central banks

Nevertheless, the response of household debt to monetary policy remains an open empirical question. Consequently, a growing body of literature over the past decade has focused on evaluating the role of monetary policy in mitigating debt overhang and financial vulnerabilities as a strategy to safeguard against future crises. Svensson (2017) argues that tighter monetary policy exacerbates household debt burdens by suppressing income growth and reducing debtors' repayment capacity. In contrast, Gourio et al. (2016) and Gelain et al. (2017) suggest that tighter monetary policy reduces household debt in the medium term, as elevated interest rates deter households from borrowing. Supporting this perspective, Fagereng et al. (2022) uses microdata to confirm that households respond to monetary tightening by reducing borrowing; however, the negative impact on debt servicing is more pronounced for households that were initially highly indebted.

Against this backdrop, this paper makes three key contributions to understanding household debt dynamics and the role of monetary policy. First, using the law of motion for household debt as formulated by Mason and Jayadev (2014), we quantify the roles of net new borrowing and debt servicing (Fisher effects) in Thailand's household debt dynamics. Second, we provide empirical evidence of an intertemporal trade-off in using monetary policy to address household debt. Specifically, while monetary easing reduces the debt servicing burden in the short term, it also leads to an increase in net new borrowing and a longer-term accumulation of debt. Finally, we explore how net new borrowing and Fisher effects respond to monetary policy shocks at different stages of the credit cycle, addressing debates on policy nonlinearity. The findings indicate that monetary policy shocks have strong and significant effects when debt is low, whereas during periods of high debt, these effects are generally muted.

The paper proceeds as follows. Section 2 describes the data. Section 3 analyzes the roles of net new borrowing and Fisher effects in Thailand's household debt evolution. Section 4 outlines the empirical approach to studying household indebtedness responsiveness to monetary policy. Section 5 presents baseline results, robustness checks, and compares responses across high and low leverage regimes. The concluding section discusses policy considerations based on these findings.

2 Data

This study employs two key data sets: one for variable construction and another for empirical regression, where the constructed variables are used alongside macroeconomic variables in the regression analysis.

Key variables are constructed based on the household debt law of motion proposed by Mason and Jayadev (2014), approximated as follows:

$$\Delta b_t \approx d_t + (i_t - g_t - \pi_t)b_{t-1}, \tag{1}$$

where the change in the household debt-to-income ratio, Δb_t, comprises the primary deficit d_t and the Fisher effect $(i_t - g_t - \pi_t)b_{t-1}$. This terminology parallels approaches in fiscal analysis, where decomposing public debt-to-GDP provides insights into public debt dynamics.

The Fisher effect captures the real interest rate burden on household debt, derived from the Fisher equation, which defines the real interest rate as the nominal interest rate i adjusted for income growth g and inflation π. This component diminishes with higher income growth and inflation, alleviating the debt burden. To estimate the Fisher effect dynamics, this study uses real GDP as a proxy for income growth, the GDP deflator for inflation, and the minimum metail rate (MRR) for the nominal interest rate. The GDP deflator is preferred over the consumer price index (CPI) to ensure consistency in decomposing the debt-to-GDP ratio, thereby enhancing the robustness of the analysis. Ideally, the effective interest rate, calculated as the weighted average of the actual interest rate burden across various loan types, would be utilized. However, this data is only available from 2012 onward, limiting its applicability for long-term analysis. As a solution, the MRR is used as a substitute for earlier periods. Figure 1 highlights the strong correlation between the MRR and the effective interest rate, validating its use as a reliable proxy. This substitution ensures that the Fisher effect is consistently measured throughout the period.

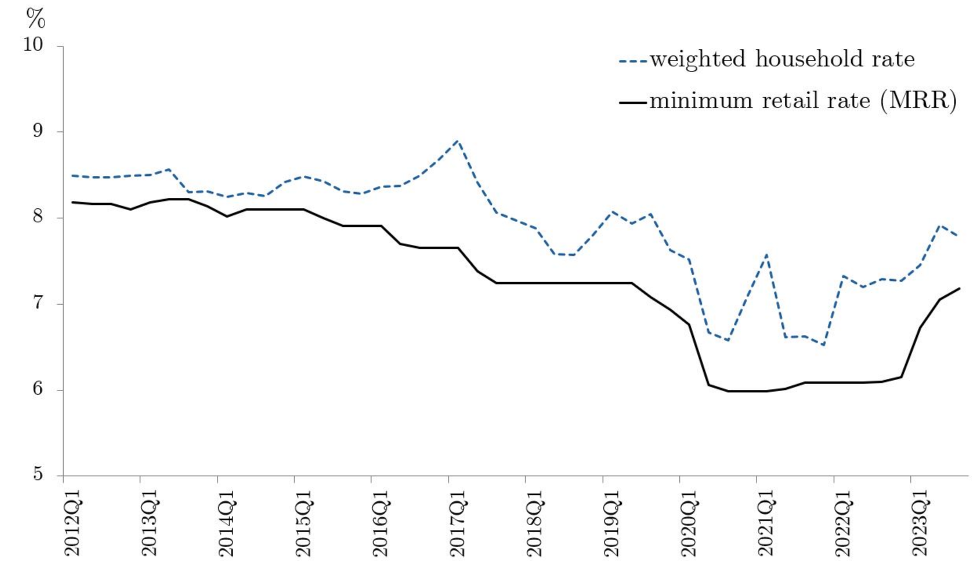

Figure 1: MRR and weighted household rate comparison (source: BOT and authors' calculation)

The primary deficit, referred to as net new borrowing in this analysis, represents the difference between new borrowing and principal repayments. A positive value indicates that households are borrowing more than they are repaying, whereas a negative value reflects net debt repayment. Aggregate household debt data theoretically capture all loan sources, yet official bank credit data account for only 39 percent of total outstanding household debt. To address this limitation, net new borrowing, which offers a more comprehensive measure of household debt changes, is employed in this study. Figure 2 illustrates the alignment between net new borrowing and official bank credit data, reinforcing its validity as a robust metric for analysis.

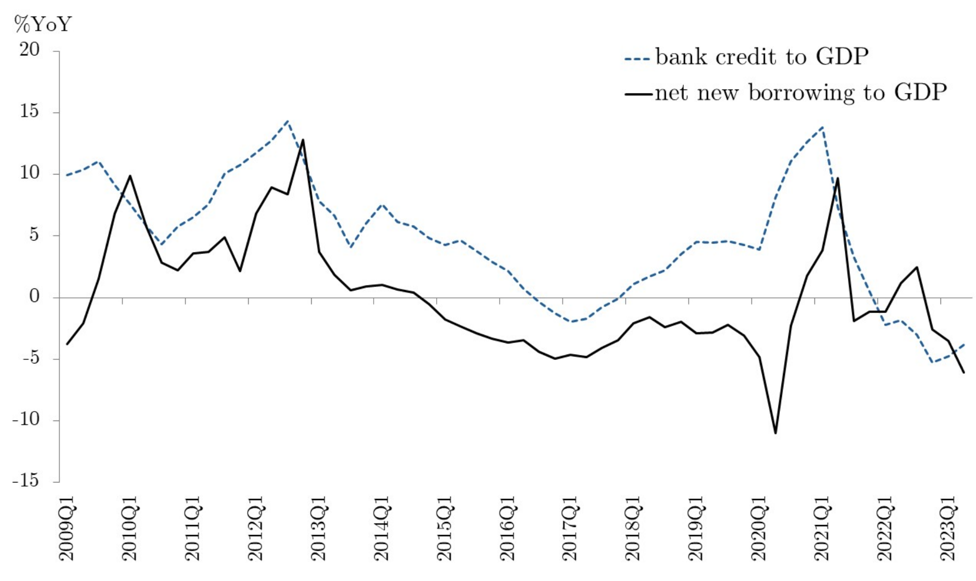

Figure 2: net new borrowing and official bank credit data (source: BOT and author calculation))

For the empirical regression, this study uses data from 1995Q1 to 2023Q4, encompassing both debt accumulation and deleveraging phases in Thailand. The primary variables of interest are net new borrowing and the Fisher effect, constructed from the law of motion for household debt discussed above. The 1-day repurchase rate serves as the indicator of monetary policy, while real GDP is used as the income indicator. Control variables include the consumer price index (CPI), bilateral exchange rates, and the commodity price index. All variables are transformed using natural logarithms, except for interest rates, which are used in levels. Table 1 presents sample statistics for the variables included in the system.

Variable	**Data source**	**Mean**	**10th**	**90th**	**Min**	**Max**	**SD**	**Variable type**
Real GDP growth	NESDC	3.23	-2.47	7.39	-12.53	15.47	4.33	Endogenous
Net new borrowing	Author calculation	-0.07	-6.58	6.40	-13.52	12.81	4.93	Endogenous
Fisher	Author calculation	1.86	-1.60	6.44	-7.51	17.32	3.61	Endogenous
1-day repurchase rate	BoT	3.50	0.81	8.75	0.50	24.00	4.23	Endogenous
Headline inflation	MoC	2.67	-0.40	6.15	-2.77	10.17	2.54	Endogenous
USDTHB	BoT	34.36	25.39	42.05	24.62	46.32	5.30	Exogenous
Dubai oil price	FED economic data	53.68	15.93	106.33	11.07	117.13	31.72	Exogenous

Table 1: Summary Statistics

To identify periods of over-leveraging and under-leveraging, we employ the credit cycle, measured through the credit gap. The credit gap is defined as the deviation of the household credit-to-GDP ratio from its long-term trend, calculated using a Hodrick-Prescott (HP) filter with a smoothing parameter of 400,000, instead of the standard 1,600. As recommended by Drehmann et al. (2018), this higher smoothing parameter is better suited for financial cycles, which typically exhibit longer durations and greater amplitudes compared to business cycles. This method aligns with the approaches of Aikman et al. (2016) and Bassett et al. (2015), and comparisons with alternative filtering techniques, such as the Hamilton filter and the Band-pass filter, reveal no significant differences in the results. The credit gap serves as a key indicator for distinguishing economic regimes. When the credit gap is positive, the economy is classified as being in an over-leveraging regime, indicating excessive credit expansion relative to the long-term trend. Conversely, a negative credit gap signals an under-leveraging regime, reflecting reduced credit levels below the trend.

3 Household debt historical decomposition

This section provides a comprehensive analysis of Thailand's household debt dynamics, focusing on two primary components—the Fisher effect and net new borrowing—and situates these findings within the context of international debt dynamics for comparative insights.

The Fisher effect reflects the real interest rate burden, which varies with macroeconomic conditions. A higher Fisher effect signifies an increased burden, which impacts household debt sustainability. In Thailand, this effect closely reflects trends in income growth and inflation, mirroring broader macroeconomic dynamics. During economic downturns, such as the Asian Financial Crisis (AFC) and the COVID-19 pandemic, contractions in income growth amplified the Fisher effect, raising the debt burden. Conversely, periods of robust nominal GDP growth mitigated its impact by offsetting interest rate pressures. For example, the post-AFC recovery (1999–2002), driven by strong export growth, alleviated the real interest rate burden despite stable nominal interest rates. Figure 3 illustrates the impact of the Fisher effect on Thailand's debt-to-GDP ratio during significant macroeconomic shifts.

Net new borrowing, defined as new borrowing net of principal repayments, has been a key driver of debt reduction during deleveraging episodes. Historically, this component has played a pivotal role in reducing Thailand's household debt-to-GDP ratio. For example, during the post-AFC period, economic uncertainty prompted households to curtail borrowing, resulting in significant debt reductions. Similarly, the deleveraging phase during 2016–2018 followed a surge in borrowing triggered by the government's first-car policy, as households shifted focus to debt repayment. Following that, the debt reduction in 2019 was partly driven by the Bank of Thailand's implementation of loan-to-value measures (LTV) in April 2019 to curb speculative borrowing in the real estate market, which were later eased in October 2021. More recently, post-COVID-19 trends reveal a slowdown in new borrowing due to reduced demand and cautious lending practices. Figure 4 demonstrates the alignment between net new borrowing and broader household debt dynamics, emphasizing its critical role in shaping the debt-to-GDP ratio.

The interplay between net new borrowing and the Fisher effect highlights the complexity of Thailand's household debt dynamics. Figure 4 shows how these components interact to shape changes in the debt-to-GDP ratio. Net new borrowing has consistently been the primary driver of debt reduction during deleveraging episodes. In contrast, the Fisher effect generally adds to the debt burden but is mitigated during periods of strong nominal GDP growth. Conversely, the most recent deleveraging episode in 2022 was influenced by rising global inflation, driven by oil price shocks amid the Russia-Ukraine conflict. These findings underscore the distinct yet interconnected roles of net new borrowing and the Fisher effect in shaping household debt sustainability.

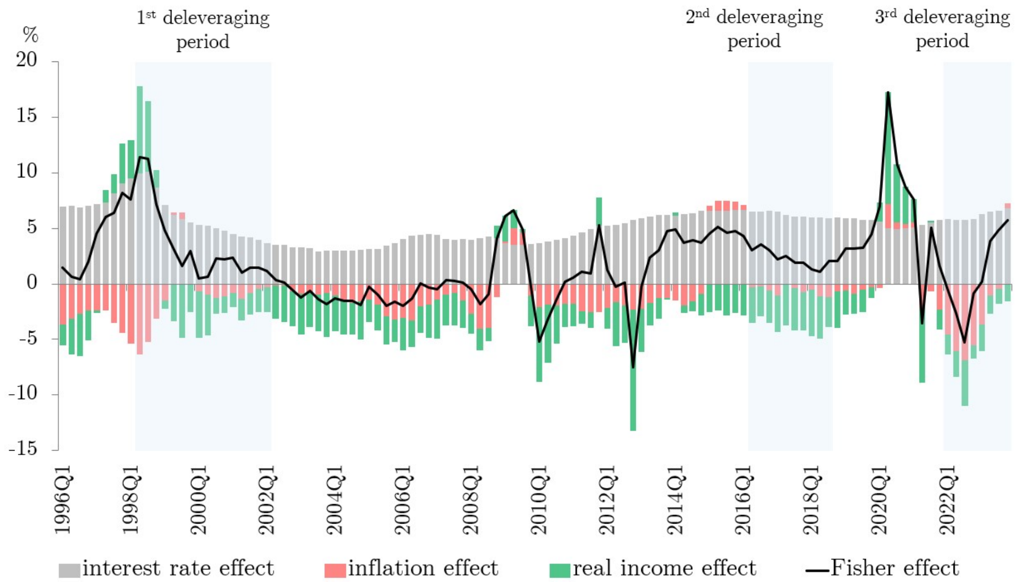

Figure 3: Fisher effect decomposition (Source: BIS, NESDC, and BOT calculations)

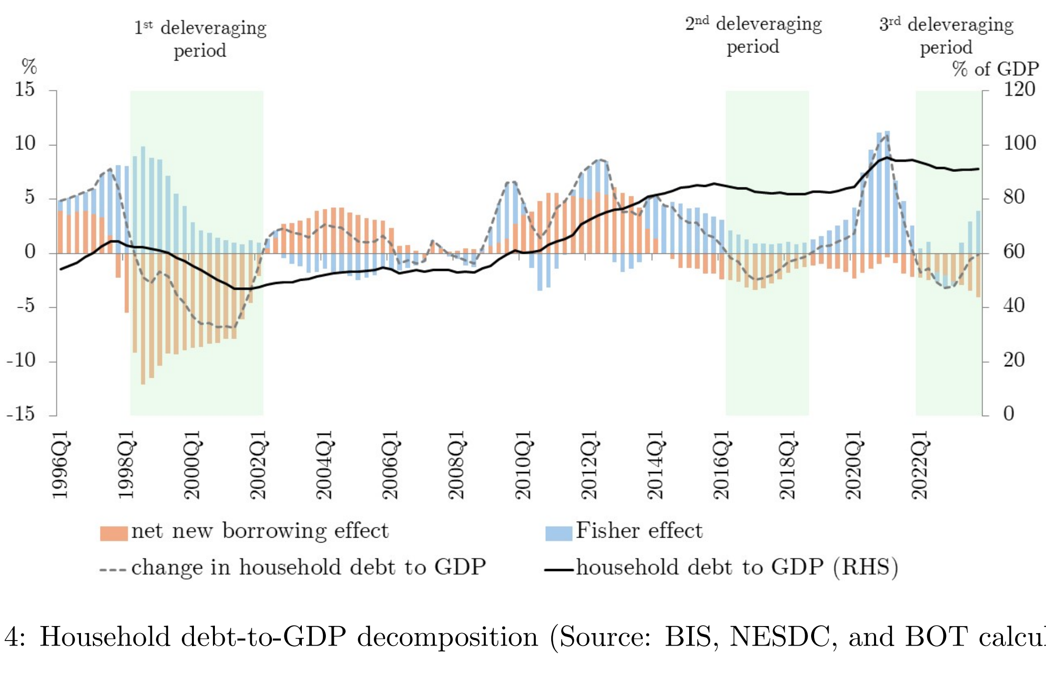

Figure 4: Household debt-to-GDP decomposition (Source: BIS, NESDC, and BOT calculations)

Thailand's household debt dynamics share commonalities with international trends but also exhibit unique local characteristics. The factors influencing debt trajectories can be broadly categorized into macroeconomic conditions, monetary and fiscal policies, and specific debt triggers. These factors are partially captured in this study's analysis of the Fisher effect and net new borrowing. Below are key international observations relevant to understanding Thailand's household debt dynamics.

1. **Interest rates play a fundamental role in shaping debt sustainability and deleveraging dynamics.** Mason and Jayadev (2014) applied this framework to analyze U.S. debt dynamics from 1929 to 2010, finding that when the real interest rate $(i - \pi)$ exceeds income growth (g), deleveraging becomes challenging. In such cases, fluctuations in the debt-to-income ratio are driven primarily by the Fisher effect rather than by net new borrowing. Their findings suggest that reducing debt-to-income ratios requires a combination of robust economic growth, higher inflation, and lower interest rates. Similarly, Fagereng et al. (2022) examined Norwegian household microdata, revealing that while changes in the debt-to-income ratio were largely attributable to net new borrowing, the Fisher effect had a significant impact, particularly on highly indebted households. Their projections suggest that an increase in interest rates could lead to a 2% reduction in the debt-to-income ratio across household groups over a 2–3 year period.

2. **Prolonged low interest rates encouraging debt accumulation.** Prolonged periods of low interest rates—often referred to as "low for long" policies—have been observed to ease borrowing costs and encourage debt accumulation, particularly among lower-income households. While these measures initially support economic recovery by stimulating consumption and investment, they often increase reliance on net new borrowing, exacerbating debt imbalances and exposing vulnerable households to economic shocks These trends, observed in both advanced and emerging economies, including Thailand, highlight the inherent trade-offs of interest rate policies in managing debt dynamics (Emiris and Koulischer, 2021; Kose et al., 2019).

3. **Temporary government stimulus policies can lead to debt accumulation.** While stimulus measures are often implemented to boost economic activity, they can inadvertently lead to excessive household borrowing and prolonged debt burdens. For instance, Thailand's first-car policy (2011–2012) and South Korea's initiatives to stimulate consumer spending and support the housing market during 2023-2024. In Thailand, tax incentives under the first-car policy encouraged vehicle purchases, while in South Korea, relaxed credit access fueled a credit card lending boom (Kim, 2005). Despite household debt-to-GDP ratios nearing 100% in both countries, the subsequent deleveraging process was notably slow. In South Korea, the debt-to-GDP ratio declined at an average annual rate of only 0.4%, whereas Thailand experienced a slightly faster reduction of 1.2% per year over a three-year period. These rates of deleveraging remain relatively slow compared to historical patterns observed in both advanced and emerging markets, where household deleveraging phases typically

extend beyond four years and result in average debt-to-GDP reductions of approximately 14 percentage points. Figure 5 illustrates household debt trends during and after the first-car policy and the credit card bubble.

4. **Economic shocks and crises can also drive household debt to GDP ratio.** Household debt commonly soars before the crises such as Nordic crisis in 1990, Asian financial crisis in 1997 and Global financial crisis in 2008. After that, deleveraging episodes following financial crises tend to occur at a faster pace. The speed of deleveraging from peak debt levels typically ranges between 2.4% and 21.6% within a three-year period. For instance, Argentina's recovery in 2002 marked one of the fastest deleveraging episodes, driven by a robust economic rebound (figure 6). Similarly, Thailand's post-1997 Asian Financial Crisis deleveraging was propelled by strong net export growth, underscoring the pivotal role of economic recovery in accelerating debt reduction.

Thailand's deleveraging experiences broadly align with international patterns, reinforcing the role of economic cycles and policy interventions. Among these factors, monetary policy emerges as both a key driver and a readily available tool for central banks, with the capacity to either facilitate deleveraging through income growth or intensify over-leveraging when borrowing costs remain persistently low. This duality underscores the importance of examining the specific impact of monetary policy on household debt, a focus explored in the next section.

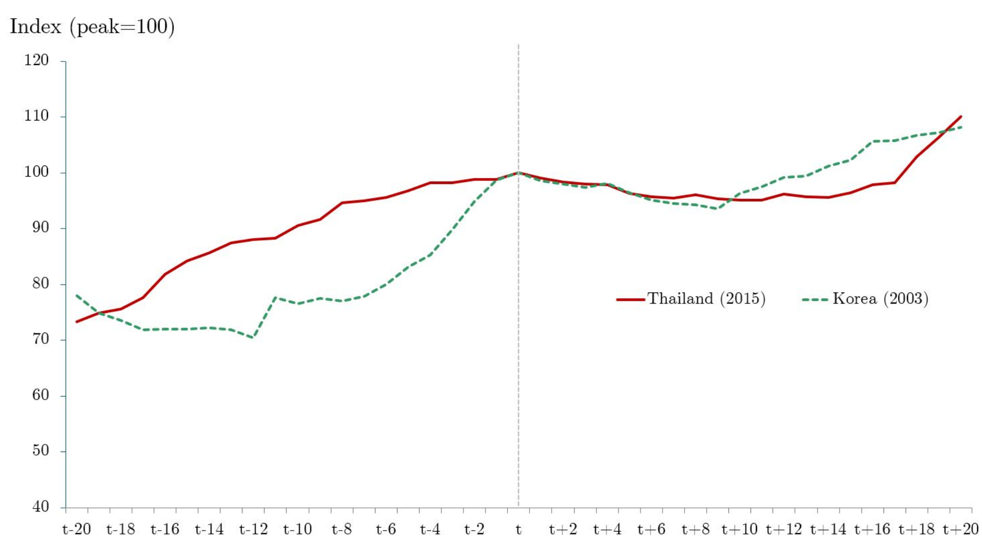

Figure 5: Thai and Korean deleveraging dynamics (t is the time when household debt is at its peak)

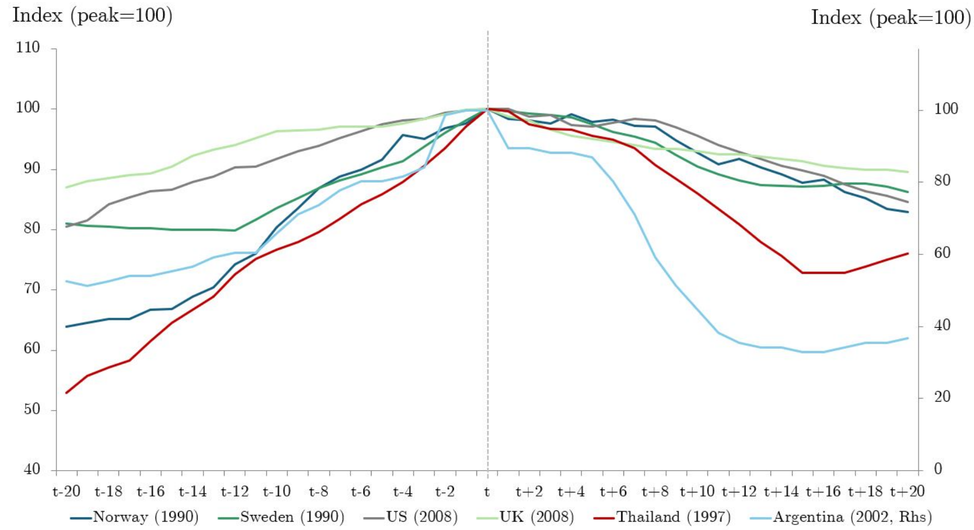

Figure 6: Global deleveraging dynamics (t is the time when household debt is at its peak)

4 Empirical approach

This study addresses two primary questions: (1) How does household indebtedness respond to monetary policy shocks? (2) How does this response vary between high and low household debt regimes?

Local projection method, developed by Òscar Jordà (2005), is used to estimate the effects of monetary policy shocks on household debt. First, the monetary policy shocks are defined as changes in the policy rate, identified using a standard exogeneity-based approach. Then, the interest rate elasticity of net new borrowing and the Fisher effect is estimated by examining household debt responses to these shocks within the local projection framework. This approach offers flexibility in estimating impulse response functions (IRFs) across multiple horizons without imposing strong dynamic restrictions. It is particularly effective for state-dependent analysis, allowing for interaction terms or dummy variables to capture varying household debt responses across different phases of the credit cycle, such as periods of high and low leverage.

The baseline non-linear local projection model is specified as follows:

$$Y_{t+h} = [\alpha_h + \beta_h mp_t + \gamma_h X_{t-1}] + I_{t-1}\left[\alpha_h^H + \beta_h^H mp_t + \gamma_h^H X_{t-1}\right] + \epsilon_{t+h}, \tag{2}$$

where the dependent variable Y_{t+h} represents the value of the endogenous variable at horizon $t+h$. The term mp_t denotes the monetary policy shock at time t, while X_{t-1} includes other relevant explanatory variables with lags. The coefficients α_h, β_h, and γ_h represent the intercept and effects of monetary policy and other control variables, respectively, in a baseline (low-debt) regime. H indicates the marginal effect in the high-debt regime. The error term ϵ_{t+h} captures unexplained variation in the dependent variable. Nonlinearity is introduced through the indicator variable I_{t-1}, which equals 1 in the high-debt regime and 0 otherwise, allowing the model to distinguish between the effects of monetary policy across these regimes. When the interaction term is omitted, the equation simplifies to a linear model that does not account for regime-dependent effects.

Equation 2 enables the estimation of a monetary policy shift's effects on variables such as net new borrowing and inflation through the coefficients on mp_t. The h-period-ahead impact of monetary policy in the baseline (low-debt) regime is represented by β_h, while in the high-debt regime, this effect becomes $\beta_h + \beta_h^H$. Tracking the response coefficients across different horizons h constructs the IRFs, capturing the dynamic effects of exogenous monetary policy shifts, commonly referred to as monetary policy shocks. This also employs an implicit recursive identification scheme to isolate these shocks, based on the assumption that macroeconomic control variables do not respond contemporaneously to changes in the policy interest rate, thus reflecting gradual adjustments to policy interventions. This recursive ordering is similar to the Cholesky decomposition used in VAR models, where the policy rate is ordered last. Identification is achieved by treating contemporaneous changes in the short-term interest rate as monetary policy shocks, with lagged values of other control variables incorporated into the estimation process.

To enhance robustness, this study applies vector autoregressive (VAR) models to estimate the effects of monetary policy shocks. This approach builds on the foundational Vector Autoregressive (VAR) model, initially developed by Sims (1980), which provides a flexible framework for analyzing relationships among multiple endogenous variables. The standard VAR model is expressed as:

$$z_t = \phi z_{t-i} + w_t, \tag{3}$$

where z_t is a vector of endogenous variables, ϕ represents coefficient matrices, and w_t is an $n \times 1$ vector of white noise error terms with zero mean and a covariance matrix. In standard VAR models, structural shocks are often identified through recursive ordering, such as Cholesky decomposition, which imposes a predetermined ordering on variables. However, such approaches may not fully capture the uncertainty inherent in economic relationships.

To address these limitations, the study extends the VAR model by employing a Bayesian framework. Bayesian estimation introduces a probabilistic perspective by treating coefficient matrices as random variables with prior distributions, capturing economic fluctuations and uncertainties more effectively. This approach also mitigates overparameterization and overfitting issues, common challenges in VAR models. A widely used prior in BVAR models is the Minnesota prior, which assumes that the coefficients on a variable's own lags are likely close to one, while coefficients on lags of other variables are closer to zero. This assumption reflects that a variable's recent history has a stronger influence on its current value than the history of other variables. The Bayesian framework thus combines this prior information with data-derived likelihood functions to generate posterior parameter distributions, providing more accurate and reliable estimates for inference and forecasting. Originally developed by Litterman (1986), this Bayesian extension was designed to improve VAR forecasting accuracy by incorporating prior beliefs about variable relationships.

The BVAR framework is further refined by incorporating sign restrictions, a method introduced by Uhlig (2005) to impose economically meaningful constraints on the IRFs. In this approach, specific economic expectations are imposed on the IRFs by constraining certain responses to align with theoretical or empirical insights. For example, to identify a contractionary monetary policy shock, restrictions could be applied to prevent the shock from causing an increase in prices or a reduction in the federal funds rate. Unlike traditional recursive identification schemes, sign restrictions allow for a more flexible identification of structural shocks, respecting economic theory without enforcing a rigid ordering of variables. This method is particularly valuable when theoretical priors are strong, but the dynamic interdependencies among variables are complex. The primary focus is on monetary policy shocks, for which sign restrictions are directly imposed on the impulse responses of interest rates, inflation, and growth. Specifically, a monetary policy contraction is identified as an increase in interest rates, accompanied by subsequent declines in both growth and inflation. No restrictions are placed on the responses of variables such as the debt-to-income ratio, primary deficit, or net new borrowing, as these are the key variables of interest for observing their dynamic responses. This identification strategy aligns with the methodology proposed by Uhlig (2005) and has been similarly applied in studies focusing on Asian data, including Kim and Lim (2018) and Kim et al. (2020).

Both the local projection method and BVAR impulse responses measure the effects of shocks on endogenous variables, but they differ in approach. Local projections generate direct forecasts with horizon-specific regressions, while BVAR models use iterated forecasting based on one-period-ahead predictions (Marcellino et al., 2006). In the BVAR framework, IRFs dynamically trace how shocks propagate through the system, capturing changes in variables over time. While this approach differs slightly from local projections, the BVAR framework provides an alternative approach for capturing the effects of monetary policy shocks.

5 Results

5.1 Linear case

A policy rate cut initially boosts economic growth by reducing debt service burdens (Fisher effects) and stimulating borrowing, but it may ultimately raise debt levels, potentially limiting growth in the longer term. Figure 7 illustrates the average dynamic effects of a one percentage point policy rate cut on debt service, net new borrowing, and real GDP growth. A one percentage point reduction in the policy rate initially decreases debt service burden, with the peak impact occurring in the 5th quarter and resulting in a cumulative reduction of 0.21 percentage points over three years. Simultaneously, the rate cut encourages new borrowing, which also peaks in the 5th quarter with a cumulative effect of 2.92 percentage points. This credit channel effect indicates that a low-interest-rate environment initially supports growth by incentivizing borrowing, with

GDP growth rising by approximately 0.63 percentage points cumulatively over three years. However, as debt levels increase, higher debt service obligations may eventually constrain growth in the longer term.

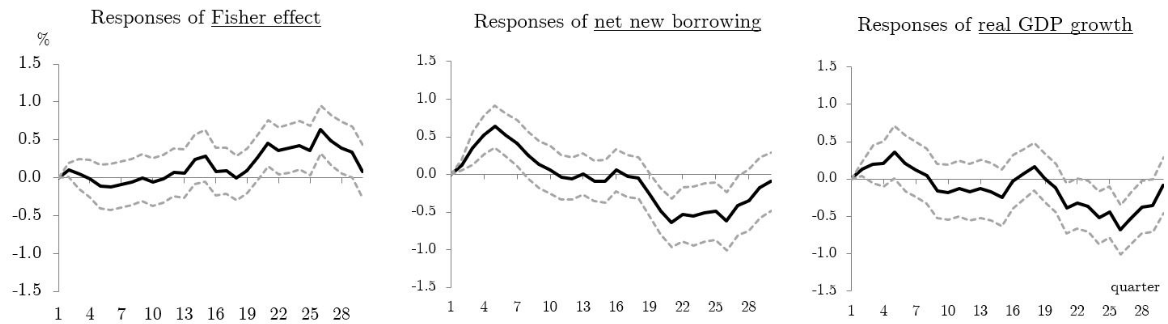

Figure 7: Impulse responses to a -1% monetary policy shock. The dashed lines display two-standard-deviation confidence bands

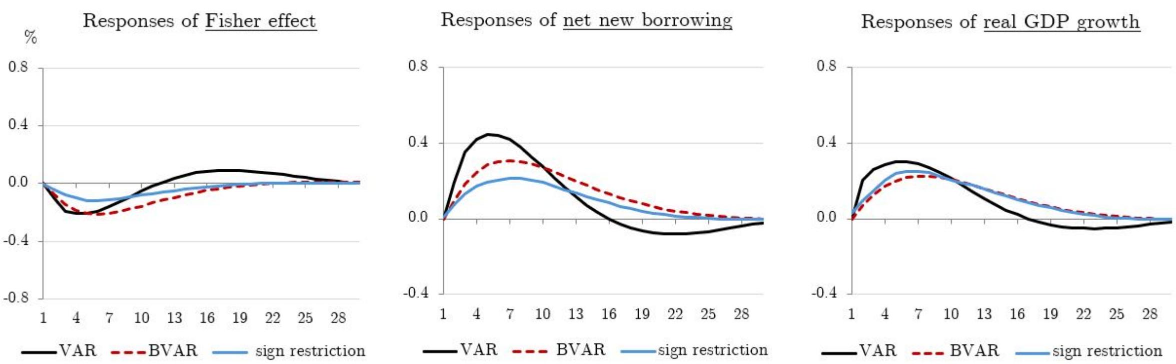

Figure 8: Impulse responses to a -1% monetary policy shock across alternative model specifications (VAR, BVAR, and BVAR with sign restrictions). Dashed lines represent two-standard-deviation confidence bands.

The results are robust across different tests, confirming the reliability of the findings. To validate this robustness, Figure 8 presents impulse responses from alternative estimations—VAR, BVAR, and BVAR with sign restrictions—compared with the baseline linear model. Policy rate shocks are identified through sign restrictions, with constraints requiring a contemporaneous decrease in the policy rate alongside increases in GDP growth and inflation. Consistent across models, the results show that lower interest rates temporarily reduce debt service burdens, while increased borrowing spurred by rate cuts supports short-term growth. However, as debt accumulates, this growth effect diminishes in the long run, highlighting the trade-offs involved in monetary policy.

These findings highlight the intricate trade-offs involved in monetary policy expansion, particularly through the long-term debt propagation mechanism discussed by Drehmann et al. (2023). While increased household borrowing initially stimulates economic growth—often creating a "hump-shaped" growth trajectory—the cumulative debt service burden gradually outweighs these gains. Over time, the growing obligations of interest and principal payments exert a significant drag on economic output, with this reversal generally occurring several years after the borrowing peak, typically within a 5–7-year timeframe. As households face escalating debt service costs, their spending capacity becomes constrained, a challenge further intensified for households with high marginal propensities to consume and tight liquidity constraints, ultimately amplifying the contraction in output during this reversal phase.

Building on these dynamics, Jordà et al. (2024) emphasize the concept of credit cycle amplification, where initial economic stimulus from monetary easing contributes to increased debt levels that, over time, limit economic growth. The authors illustrate how accommodative policy, while boosting borrowing and consumption in the short term, creates conditions for a boom-and-bust cycle in which rising debt burdens constrain long-term growth. Expanding on this concept, Alpanda et al. (2019) illustrate how elevated household debt can reduce the effectiveness of policy rate cuts, as highly indebted households tend to prioritize debt repayment over consumption. This feedback loop undermines the intended effects of monetary policy, highlighting the diminishing returns of interest rate cuts in economies with significant household debt.

The trade-off observed in the average results does not imply that the central bank should refrain from lowering interest rates. Rather than viewing rate cuts as inherently problematic, policymakers should identify economic contexts where the benefits of lower rates outweigh the risks. By adapting interest rate policies to align with these scenarios, central banks can better balance short-term growth objectives with long-term sustainability. Careful timing and targeted rate adjustments enable policymakers to support economic expansion effectively while managing the associated debt risks.

5.2 Non-linear case

The transmission of monetary policy effects on household debt is often non-linear, especially in high-debt environments. Studies suggest that when household debt levels are elevated, households face greater constraints and respond less to policy adjustments due to financial burdens that limit additional spending or borrowing capacity (Albuquerque (2019), Funke et al. (2023), and Luigi and Huber (2018)). Furthermore, Fisher (1933) and Eggertsson and Krugman (2012) highlight that in periods of high debt, households tend to prioritize deleveraging over consumption, thereby reducing the effectiveness of monetary policy easing.

This study employs a state-dependent local projection approach using the credit-to-GDP gap as an indicator to assess whether responses in new borrowing and debt service to monetary policy shocks differ depending on debt levels. A positive credit gap indicates a high-credit environment, while a negative gap signals a low-credit environment. Figure 9 presents the impulse responses of new borrowing, debt service, and GDP growth to a one percentage point reduction in the policy rate, under both positive and negative credit gap conditions. The results suggest that a policy rate reduction during low debt environment (negative credit gap) creates a clear intertemporal trade-off, whereas responses in new borrowing, debt service, and GDP growth are generally insignificant during a high debt environment (positive credit gap).

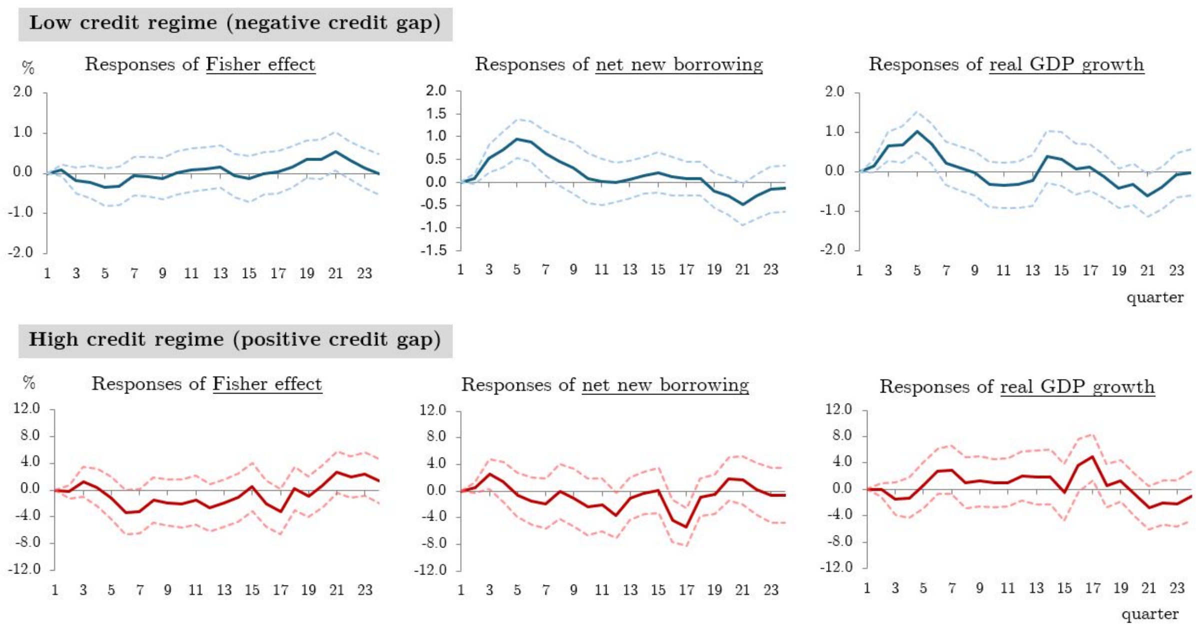

Figure 9: Impulse responses to a -1% monetary policy shock, with blue (red) lines representing the response when the credit-to-GDP gap ratio is negative (positive). Dashed lines indicate two-standard-deviation confidence bands.

The limited responsiveness of new borrowing, debt service, and GDP growth to monetary policy shocks in high credit environments can be attributed to the interplay between credit and debt cycles. In periods of credit expansion, increases in new borrowing add to household debt, subsequently raising debt service ratios. This higher debt burden constrains additional borrowing capacity and weakens the effectiveness of monetary policy transmission. These findings align with prior research, including Aikman et al. (2016), Alpanda et al. (2019), Jordà et al. (2020), and Bräuer and Rünstler (2020), which highlight the differential impact of monetary policy across credit cycle stages. Two primary explanations support this phenomenon: (1) during credit booms, rising asset prices drive speculative borrowing, diminishing the sensitivity of credit to borrowing costs; and (2) policy rate reductions are less effective in stimulating borrowing during these periods, as financial institutions are more cautious about extending credit to already indebted households due to heightened default risk.

The findings suggest that, while monetary policy easing can present long-term trade-offs, it may still hold benefits in certain high-debt contexts where new borrowing is already constrained. In such scenarios, interest rate reductions might not substantially drive new debt accumulation, as households in high-debt conditions are often focused on repayment rather than further borrowing. Instead, rate cuts may help ease the burden of existing debt by reducing debt servicing costs, which can improve household cash flows and provide modest support for consumption.

Thailand's state-dependent transmission effects align with international findings, yet the magnitude of this transmission is notably lower, warranting closer examination. In Thailand, the peak impact of policy rate changes on credit—known as the credit channel—occurs within 4–6 quarters. This timing aligns with findings from Disyatat and Vongsinsirikul (2003), which highlight that the effects of rate hikes on credit are most pronounced around the 7th quarter due to the quasi-contractual nature of loans, which resist immediate adjustment. Additionally, delays in the transmission of policy rate changes to variables like the MRR further contribute to the slower response, as observed in Pariya (2020); for instance, following a policy rate increase, the MRR typically peaks in impact after one quarter, reverting by the 6th quarter

Thailand's credit transmission effect is relatively modest compared to other countries. Advanced economies often report a policy rate impact on credit ranging between 1–2 percent, with the U.S. and Australia exhibiting higher effects of 2–4 percent. In contrast, Thailand's transmission rate aligns more closely with neighboring economies, such as Malaysia, the Philippines, and South Korea, where impacts are between 0.1–0.7 percent (table 2). Several factors contribute to this discrepancy. First, Thailand's pass-through rate—the degree to which policy rate changes influence retail loan rates—stands at approximately 61 percent, significantly lower than in many advanced and some emerging markets. For example, countries like the U.S. and Australia achieve pass-through rates close to 100 percent, reflecting a more direct transmission of monetary policy effects (Figure 10). Second, the structure of household debt in Thailand further dampens the transmission. Around 64 percent of household debt in Thailand is fixed-interest-rate debt, including hire-purchase loans, credit card loans, and certain mortgage products. This high proportion of fixed-rate loans reduces the immediate responsiveness of borrowing costs to policy rate adjustments. A similar pattern is observed in the U.S., where nearly 90 percent of household debt is at fixed rates, further highlighting the constraints imposed by such debt structures (Figure 11).

Table 2: Peak Effects of Monetary Policy on Credit Growth

Authors	**Country**	**Method**	**Magnitude (in %)**	**Variable**
Vicondoa, A. (2020)	UK	SVAR	1.0	Private credit growth
Berkelmans, L. (2005)	Australia	SVAR	4.0	Total credit growth
Robstad, Ø. (2018)	Norway	SVAR	0.5 - 1.0	Household credit growth
Suzuki, T. (2008)	New Zealand	VAR	0.1 - 0.4	Bank credit growth
Hofmann B. & Peersman G. (2017)	US	VAR	2.0 - 4.0	Household credit growth
Bauer, G. & Granziera, E. (2017)	Advanced economies	VAR	1.0 - 2.0	Private credit growth
Jorda, O. et al. (2015a)	Advanced economies	Local Projection Model	1.5	Mortgage debt to GDP
Gerali et al. (2010)	Euro area	New Keynesian DSGE model	2.5 - 3.8	Private credit growth
Tuaño-Amador et al. (2009)	Philippines	Long-term Structural Macroeconometric Model	0.6	Private credit growth
Hsing, Y. (2014)	South Korea	Three-stage Least Squares	0.1 - 0.3	Bank credit growth
Eklou, M. K. (2023)	Malaysia	Local Projection Model	0.7*	Bank credit growth

*note: *average per year effect*

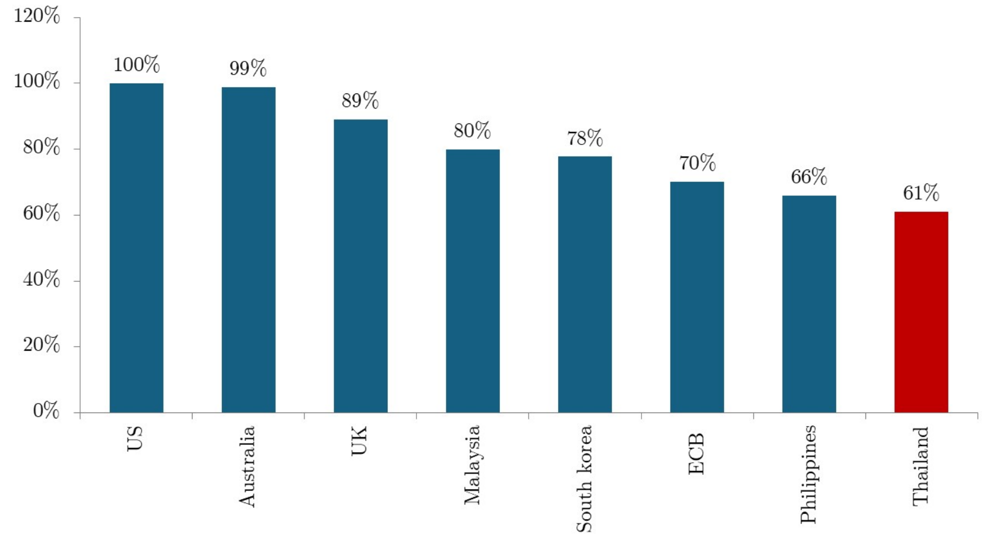

Figure 10: Degree of interest rate pass-through by country (source: BOT, BSP, BOK, CBC, BNM)
*Calculated as the change in lending rate divided by the change in policy rate from 2022 to September 2023

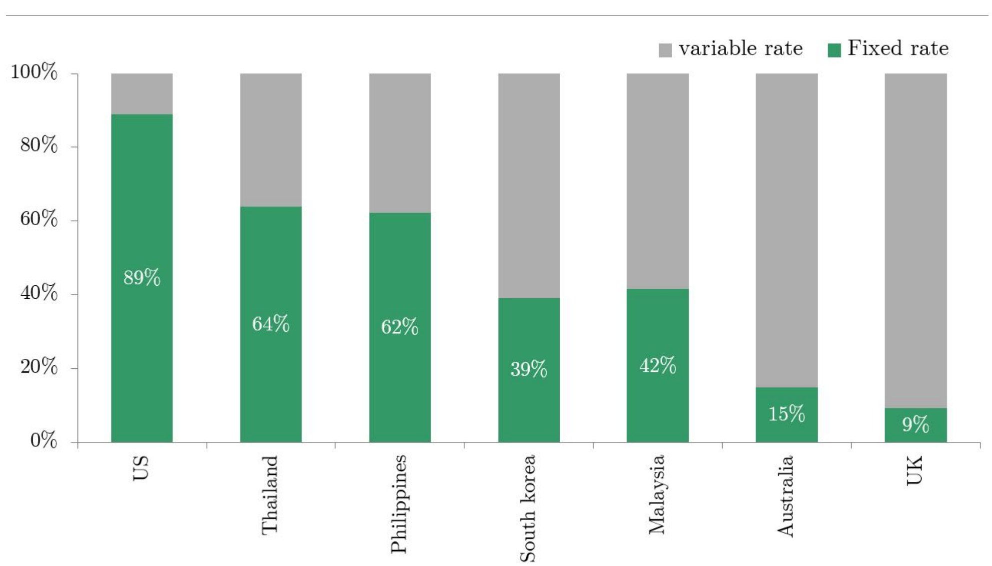

Figure 11: Household debt classified by interest rate type. source: Central bank data, CEIC, author's calculations. *Auto loans, credit card loans, and other loans are classified as fixed-interest rate loans, while mortgage loans are categorized by fixed or variable rates, following the classification method in Zabai A. (2017), "Household debt: recent developments and challenges," BIS Quarterly Review, December 2017.

6 Conclusion

This study highlights the intricate relationship between monetary policy, household debt, and macroeconomic dynamics. Over the 20-year sample period, monetary policy shocks influenced household debt primarily through changes in net new borrowing, as households adjusted their borrowing and repayment behavior in response to interest rate fluctuations. While Fisher effects—where changes in debt service costs mechanically affect debt ratios—played a role, they were largely overshadowed by these behavioral responses, underscoring the dominant role of credit demand in shaping debt trajectories. The results also reveal significant non-linearities in monetary policy transmission. When household debt levels are low, policy rate adjustments effectively influence borrowing, debt service, and economic activity. However, in high-debt environments, monetary policy becomes less effective, as constrained households prioritize deleveraging over new borrowing, limiting the responsiveness of credit and consumption to interest rate changes. This finding aligns with the broader literature on credit cycle amplification, which suggests that the effectiveness of monetary policy depends on the prevailing level of household indebtedness.

From a policy perspective, these findings highlight the importance of accounting for credit conditions when designing and implementing monetary policy. In periods of rapid credit expansion, the trade-offs between stimulating growth and managing financial stability become more complex. While monetary easing can support short-term growth, it may also contribute to long-term debt accumulation, reducing the effectiveness of future policy interventions. These dynamics suggest that monetary policy should be complemented by macroprudential tools that directly address credit risks, particularly in economies where household debt plays a significant role in economic fluctuations. By incorporating credit cycle considerations into monetary policy frameworks, central banks can enhance policy effectiveness while mitigating the risks associated with excessive household indebtedness. Future research could further explore the interaction between monetary and macroprudential policies, providing insights into optimal policy design in economies with varying levels of household debt.

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