Household Debt and Income Inequality in Thailand: A Vector Autoregressive Analysis

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(Received: 1 October 2024, Revised: 25 December 2024, Accepted: 27 December 2024)
https://doi.org/10.57260/csdj.2025.275931

Abstract

This study examines the dynamic relationships between household debt, income, GDP, and income inequality in Thailand, a nation grappling with rising household debt and persistent income disparities. Using a 19-year dataset, the research employs a Bayesian VAR (BVAR) model to explore the interdependencies among these variables and Impulse Response Function (IRF) analysis to evaluate their short-term and long-term adjustments to economic shocks. The findings reveal that household debt exhibits strong persistence and is positively influenced by income inequality, underscoring the role of disparities in driving debt accumulation. Conversely, income and GDP demonstrate resilience, with income positively influenced by GDP and negatively impacted by household debt, reflecting the burden of rising debt on income generation. GDP is shown to play a pivotal role in sustaining economic stability, while income inequality emerges as a persistent structural issue, amplified by household debt. The IRF analysis further reveals that a shock in household debt leads to a temporary decline in income and GDP, followed by stabilization in the medium term. However, income inequality responds positively to debt shocks, highlighting the disproportionate impact on low-income households and the long-term challenges of addressing inequality. The study's findings emphasize the need for targeted policies to manage household debt, promote equitable income distribution, and foster sustainable economic growth. Recommendations include debt restructuring programs, financial literacy campaigns, and progressive taxation to reduce disparities and enhance economic resilience.This research contributes to the understanding of the intricate relationships between debt, income, and inequality, offering insights for policymakers in Thailand and similar economies.

Keywords: Household debt, Income inequality, Vector autoregression model

Introduction

Thailand's economy has been continuously developing, making the relationship between household debt and income inequality a key issue in shaping the economic and social direction of various countries. In the context of Thailand's rapidly growing economy and social changes, the country has transitioned from a low-income country to a middle-income country. Particularly in recent years, Thailand has undergone significant changes in its economic structure along with shifts in wealth accumulation and distribution patterns, which have further contributed to rising household debt and income inequality.

According to the Thai Bankers' Association, the household debt-to-GDP ratio in Thailand by the end of 2024 is projected to be 91.40%, or around 16.90 trillion baht. The highest proportions of this debt come from credit cards, leasing, and personal loans. Furthermore, data from the Bank of Thailand (BOT) indicates that the outstanding household debt in Thailand as of the third quarter of 2023 stood at 16.20 trillion baht, an increase of 3.40% compared to the same period last year (YoY), accounting for 90.90% of GDP. The COVID-19 pandemic has deepened household debt risks in Thailand, particularly for informal workers and low-income families who lack access to formal financial protection (Bank of Thailand, 2022). This trend has been steadily slowing down from the previous quarter. Thailand's household debt-to-GDP ratio has exceeded 80% since 2015, with nearly one-third of this debt being for consumption, such as personal loans and credit card debt, often referred to as non-productive loans (NPLs). This figure is relatively high compared to neighboring countries like Malaysia and China, where the ratios are 14% and 13%, respectively.

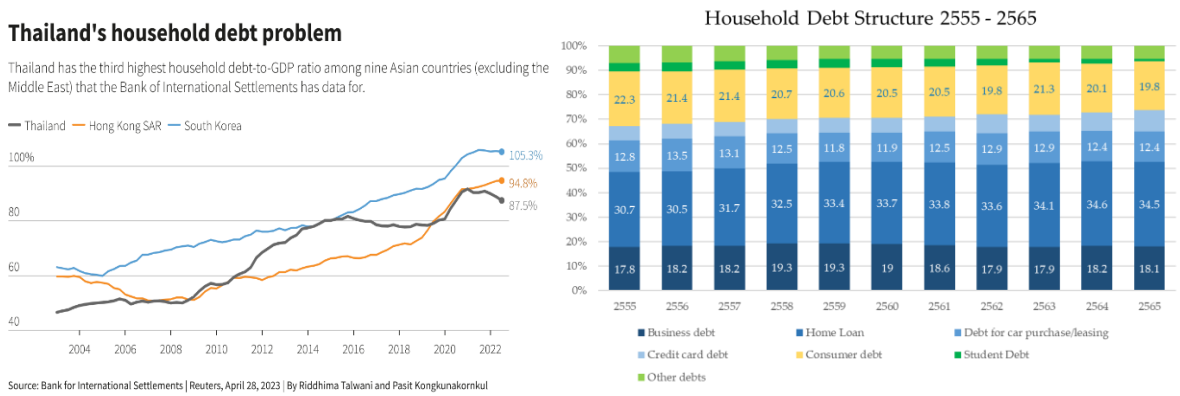

Figure 1 Thailand's Household Debt to GDP Ratio and Household Debt Structure (Source: Bank of Thailand. Monetary Policy Report, Q4/2023)

Regarding the income inequality situation, the National Economic and Social Development Council (NESDC) (2022) has shown that income and general consumption inequality in Thailand has tended to decline over the past 30 years. However, this remains a subject of differing opinions and debate, such as the accuracy of official income and expenditure inequality indicators, which may not reflect the true reality. These indicators are often calculated using data from the Socio-Economic Survey (SES), which may lack representation of households in the top 1% of income earners. Another point of contention is that appropriate measures of inequality should consider wealth or net assets alongside income. A study by Credit Suisse indicated that wealth concentration in Thailand ranks first among Asian countries (Credit Suisse, 2018).

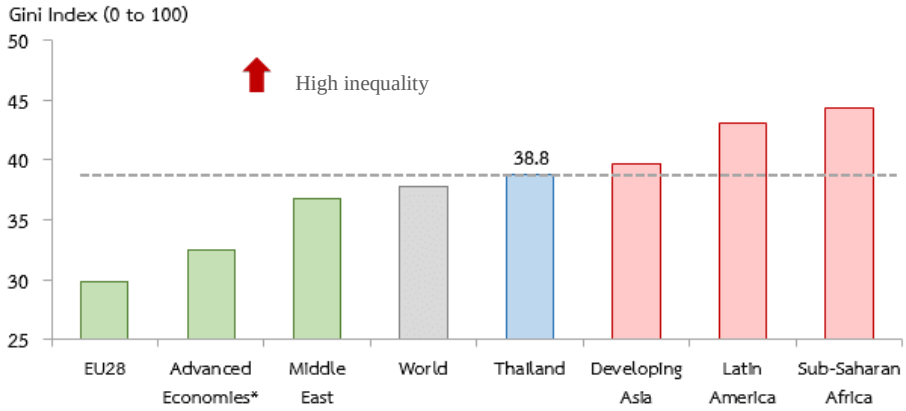

Figure 2 Thailand's Gini Index
(Source: Bank of Thailand, Financial Stability Report 2022)

A review of previous studies reveals continuous research on income and economic inequality. For instance, the studies by Lebarz (2014) and Iacoviello (2008) examined the relationship between household debt and economic inequality using data from various countries. They concluded that there is a clear connection between these factors. Lebarz (2014) found that in countries where debt distribution is imbalanced across income groups, wealth inequality tends to increase. Iacoviello (2008) examined the impact of income inequality on household debt levels in the United States, finding that rising income inequality contributed to increased household debt during periods of economic expansion. This led to greater income volatility and widened wealth inequality among the population during those times.

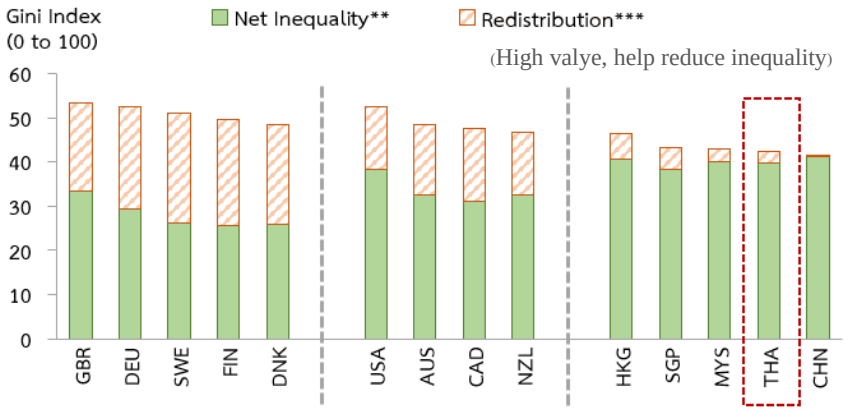

Figure 3 Thailand's Income Inequality and Distribution Indicators
(Source: Bank of Thailand, Financial Stability Report 2022)

Additionally, Mian & Sufi (2014) found that household wealth inequality in the United States has been consistently increasing, especially after the 2008 financial crisis. In 1992, the wealthiest households (the top 10% of all households) owned 66% of the total wealth, which increased to 71% by 2007. After the financial crisis, the share of wealth owned by the wealthiest households further rose to 74%.

Thus, this study focuses on analyzing the relationship between household debt and income inequality in Thailand, as well as other economic factors, to understand the potential impact on economic stability resulting from income inequality in the country. The goal is to help design effective economic policies or measures that can address and rectify structural issues within Thailand's economic system.

Methodology

This study utilizes secondary data in the form of time series data from 2005 to 2023, covering a total of 19 years. The researcher selected four key variables for analysis:

- Household Debt: Analyzing the volume and structure of household debt will help in understanding the economic value generated by household borrowing.
- Household Income: Studying the trends and structure of household income will aid in analyzing and understanding the overall picture of income inequality in society.
- Income Inequality Index: Using indices such as the Gini coefficient to measure the level of income inequality.
- GDP: GDP is the total monetary value of all finished goods and services produced within a country's borders in a specific period. It serves as a broad measure of a nation's overall economic activity and health.

This study employs the Bayesian Vector Autoregression (BVAR) model for data analysis. The BVAR model is an extension of the traditional Vector Autoregression (VAR) model, incorporating prior distributions into parameter estimation, making it particularly suitable for contexts where data are limited, or multicollinearity is present among variables. By using historical data, the BVAR model allows for the relationships between endogenous variables to depend on their past values, other endogenous variables, and the current values of exogenous variables, while leveraging prior information to enhance the stability and reliability of the estimates. Since the exact form of these relationships is not known in advance, the BVAR model, like the VAR model, is popular for studying the effects of changes in one variable on others. Additionally, the incorporation of priors enables better estimation under small-sample conditions, making it a robust tool for dynamic economic analyses.

The selection of the Bayesian Vector Autoregressive (BVAR) model follows core econometric concepts that emphasize the dynamic interactions among time series variables. As Sriboonchitta (2004) notes, multivariate models such as VAR and its Bayesian extension are particularly suitable for analyzing systems of interrelated economic indicators, especially when dealing with simultaneity and feedback effects.

In Thailand, while the traditional VAR model has been widely used, such as in studies by Bandit and Sujit to examine the impact of domestic oil price changes on the Thai economy, the response of inflation to economic variables, or the size and delay of monetary policy transmission mechanisms, the BVAR model offers an advantage by addressing estimation challenges inherent in such studies. Therefore, the BVAR model is particularly well-suited for dynamic studies of economic changes arising from various factors, especially when data constraints exist.

The steps in this study are as follows:

1. Define the variables used in the model: The researcher selected household debt, household income, interest rate, unemployment rate, income inequality index, and economic policy as the variables for the study.

2. Test for stationarity of the variables using the Augmented Dickey-Fuller (ADF) Unit Root Test: Time series data should be evaluated for stationarity, which refers to data being in a state of statistical equilibrium where it does not change over time. The research team used the Augmented Dickey-Fuller method to test the stationarity of the data. Stationary data implies that the time series will tend to revert to mean overtime, with no long-term changes in variance. Non-stationary data, on the other hand, implies that the variance increases over time without reverting to a mean, leading to endless changes. If data is used without testing for stationarity,

it could result in nonstandard distributions of statistics (e.g., t-statistics), which can lead to incorrect conclusions and spurious regression.

Therefore, the data used in the bayesian vector autoregression (BVAR) model for this study, which includes household debt (*lnDEP*), income (*lnINC*), GDP (*lnGDP*), and income inequality (*lnIEQ*), with a lag length of $p = 1$, can be expressed as the following system of equations:

$$lnDEP_t = c_1 + \emptyset_{11} lnDEP_{t-1} + \emptyset_{12} lnINC_{t-1} + \emptyset_{13} lnGDP_{t-1} + \emptyset_{14} lnIEQ_{t-1} + \varepsilon_{1t}$$
$$lnINC_t = c_2 + \emptyset_{21} lnDEP_{t-1} + \emptyset_{22} lnINC_{t-1} + \emptyset_{23} lnGDP_{t-1} + \emptyset_{24} lnIEQ_{t-1} + \varepsilon_{2t}$$
$$lnGDP_t = c_3 + \emptyset_{31} lnDEP_{t-1} + \emptyset_{32} lnINC_{t-1} + \emptyset_{33} lnGDP_{t-1} + \emptyset_{34} lnIEQ_{t-1} + \varepsilon_{3t}$$
$$lnIEQ_t = c_4 + \emptyset_{41} lnDEP_{t-1} + \emptyset_{42} lnINC_{t-1} + \emptyset_{43} lnGDP_{t-1} + \emptyset_{44} lnIEQ_{t-1} + \varepsilon_{4t}$$

Where: c = c is the constant
$\emptyset$ = $\emptyset$ is the coefficient of the time trend
ε = ε is the error term

3. Determine the appropriate lag length for the model: The selection of an appropriate number of lags in the model is made using the information criteria with the lowest value. The same number of lags is applied to all variables in the study. The research team selected the Akailke Information Criteria (AIC) to determine the lag length. Understanding the lag structure in macroeconomic relationships is crucial for effective modeling. According to Pukahuta (2012), the transmission mechanism of monetary policy in Thailand is characterized by delayed and cumulative effects on various economic variables, making time-series models like VAR or BVAR particularly suitable for capturing these dynamics.

4. Analyze cointegration of the variables' returns: Cointegration testing is used to check the stationarity of the deviations from the long-run equilibrium relationship of non-stationary variables. If the variables exhibit cointegration, it indicates a long-term relationship between them.

5. Test the stability of the model: This involves checking whether the eigenvalues of the model are less than 1.

6. Test for causality among the variables: The Bayesian Vector Autoregressive (BVAR) model and Granger Causality Test are used to test for causal relationships between the variables. This test is conducted to determine the direction of changes, showing whether the variables in the BVAR model are interrelated and can explain each other more accurately by using past data to forecast the variables of interest. When the data is stationary, it can be analyzed to determine the nature and direction of the causal relationship between the variables.

7. Analyze the relationship between variables using the Cumulative Orthogonal Impulse Response Function: This analysis assesses the response of one variable to a shock in other variables, examining the direction of the response in both the short and long term. The equations can be written as follows:

$$Z_t = \mu + \sum_{i=0}^{\infty} \emptyset_i u_{t-i}$$

Where: μ = μ is the constant
φ = φ is the coefficient of the estimated parameter
u = u represents the shocks

Results

The findings are divided into three parts: 1) The analysis of stationarity or stability of the variables. 2) The analysis to determine the appropriate lag length and the stability of the coefficient estimates in the BVAR model. And 3) the analysis of the variables in a disaggregated manner and the dynamic impact analysis.

Part 1 Unit Root Test using the Augmented Dickey-Fuller (ADF) Test

The ADF test was conducted to assess whether all six variables are stationary or stable, in order to prevent issues of spurious regression, where variables appear to be related but are not truly correlated in the BVAR model. The results from Table 1 indicate that all six variables are stationary and stable, meeting the criteria of being stationary with trend and intercept at lag lengths of 0 and 2, at a significance level of 0.01. Following this, the variables were tested in the second part of the analysis.

Table 1 Augmented Dickey – Fuller Test (ADF-test)

Variables	Level			1ST Difference		
	None	Intercept	Intercept & Trend	None	Intercept	Intercept & Trend
DEP_t	3.930329	-0.871628	-2.349594	-2.358697**	-4.204928***	-4.045360***
INC_t	1.948791	-1.875777	-1.381039	-2.609283***	-3.206906***	-3.611811***
GDP_t	2.090323	-1.787669	-1.341620	-2.511411**	-3.184958**	-3.423089*
IEQ_t	-4.25918***	-2.220719	-0.447479	-1.129661*	-5.272438***	-6.445863***

Note: * Indicates a confidence level of 90%, ** Indicates a confidence level of 95%, and *** Indicates a confidence level of 99%.

Part 2 Testing Optimal Lag Length using Akailke Information Criteria (AIC)

The AIC method was used to select the optimal and equal lag length for all variables, and the Inverse Roots of AR Characteristic Polynomial test was applied to assess the stability of the six variables in the VAR model. Table 2 presents the analysis for determining the optimal lag length. The appropriate lag length is selected based on the lowest AIC value. According to Table 2, the lowest AIC value is found at Lag 1, indicating that the optimal lag length for the model is 1. After determining the optimal lag length, the Inverse Roots of AR Characteristic Polynomial test was performed to verify the reliability and stability of the coefficient estimates in the VAR model.

Table 2: Optimal Lag Length

Lag	Log L	LR	FPE	AIC	SC	HQ
0	171.9446	NA	3.09e-14	-19.75819	-19.56214	-19.73870
1	232.7729	85.87517*	1.70e-16*	-25.03210*	-24.05185*	-24.93466*
2	243.3644	9.968489	4.82e-16	-24.39581	-22.63136	-24.22042

(Source: Calculations, 2024)

Part 3 Bayesian Vector Autoregression (BVAR) Model Analysis and Impulse Response Function (IRF) Analysis

The Bayesian Vector Autoregression (BVAR) coefficient estimation table reflects the dynamic relationships between key variables: household debt ($lnDEP_t$), income ($lnINC_t$), GDP ($lnGDP_t$), and income inequality ($lnIEQ_t$). The estimated coefficients represent the impact of lagged variables on the current values of the dependent variables (Table 3).

Table 3 Estimated from Bayesian Vector Autoregression (BVAR Model)

Dependent Variable	Independent Variable	Lag	Coefficient	Significance
$lnDEP_t$	**$lnDEP_{t-1}$**	**1**	**0.336**	***
	$lnINC_{t-1}$	1	-0.096	
	$lnGDP_{t-1}$	1	0.120	
	$lnIEQ_{t-1}$	**1**	**0.200**	**
$lnINC_t$	$lnDEP_{t-1}$	1	-0.080	
	$lnINC_{t-1}$	**1**	**0.690**	***
	$lnGDP_{t-1}$	1	0.200	
	$lnIEQ_{t-1}$	1	-0.042	
$lnGDP_t$	$lnDEP_{t-1}$	1	-0.050	
	$lnINC_{t-1}$	**1**	**0.220**	**
	$lnGDP_{t-1}$	**1**	**0.710**	***
	$lnIEQ_{t-1}$	1	-0.040	
$lnIEQ_t$	**$lnDEP_{t-1}$**	**1**	**0.150**	**
	$lnINC_{t-1}$	1	-0.080	
	$lnGDP_{t-1}$	1	-0.030	
	$lnIEQ_{t-1}$	**1**	**0.222**	***

Note: * Indicates a confidence level of 90%, ** Indicates a confidence level of 95%, and *** Indicates a confidence level of 99%.
(Source: Calculations, 2024)

$lnDEP_t$ (household debt), the coefficient of $lnDEP_{t-1}$ is positive (0.336), indicating that debt in the previous period has a positive effect on current household debt. This suggests a continuation of borrowing behavior within the economic system. Meanwhile, income ($lnINC_{t-1}$) has a slight negative effect (−0.096) on household debt, implying that higher income reduces the need for borrowing.

$lnINC_t$ (income) variable has a coefficient for $lnINC_{t-1}$ of 0.690, which is statistically significant ($p < 0.01$). This reflects the continuity of income growth within the economic system. Household debt in the previous period ($lnDEP_{t-1}$) has a slight negative impact on current income (−0.080), possibly reflecting the burden of debt reducing household consumption or investment capabilities.

$lnGDP_t$, GDP in the previous period ($lnGDP_{t-1}$) positively and significantly affects current GDP (0.710), indicating the persistence of economic growth. Additionally, lagged income ($lnINC_{t-1}$) positively impacts GDP (0.220), demonstrating a positive relationship between household income and overall economic growth.

$lnIEQ_t$ (income inequality), the coefficient of lnieq-lag1 is positive (0.222), showing the persistence of inequality within the economic system. Household debt in the previous period ($lnDEP_{t-1}$) positively affects inequality (0.150), reflecting the linkage between household debt burdens and income disparities.

The table 4 summarizes the results of the Granger Causality test, which evaluates whether one variable provides predictive information for another. The null hypothesis states that the first variable does not Granger cause the second. The following insights are drawn:

1. Household Debt and Income Inequality (*lnDEP → lnIEQ*):
   The null hypothesis is rejected ($p = 0.032$), indicating that household debt Granger causes income inequality. This suggests that rising household debt levels in previous periods contribute to increasing income inequality. Historical evidence shows that excessive private sector leverage often precedes financial crises and long-run fiscal distress, reinforcing the need for proactive credit regulation (Jordà, Schularick & Taylor, 2013).
2. Income and Household Debt (*lnINC → lnDEP*):
   The null hypothesis is rejected ($p = 0.022$), showing that changes in income levels influence household debt. This reflects that variations in household income can drive borrowing behavior, either by reducing the need for loans or increasing confidence in borrowing.
3. GDP and Income (*lnGDP → lnINC*):
   The null hypothesis is rejected ($p = 0.015$), suggesting that GDP growth in previous periods Granger causes changes in household income. This highlights the role of economic growth in shaping income dynamics.
4. Bidirectional Relationship Between Income and Income Inequality (*lnINC ↔ lnIEQ*):
   Both directions reject the null hypothesis ($p = 0.009$ and $p = 0.011$), indicating a bidirectional relationship. Changes in income levels can reduce or exacerbate income inequality, while existing disparities in income distribution influence household income levels in subsequent periods.

Table 4 Granger Causality test

Null Hypothesis	F-Statistic	P-Value	Conclusion
lnDEP does not Granger cause *lnIEQ*	4.35	0.032	lndep → lnieq
lnINC does not Granger cause *lnDEP*	5.21	0.022	lninc → lndep
lnGDP does not Granger cause *lnINC*	6.14	0.015	lngdp → lninc
lnINC does not Granger cause *lnIEQ*	7.25	0.009	lninc ↔ lnieq (bidirectional)
lnIEQ does not Granger cause *lnINC*	6.67	0.011	lninc ↔ lnieq (bidirectional)

Note: * Indicates a confidence level of 90%, ** Indicates a confidence level of 95%, and *** Indicates a confidence level of 99%.
(Source: Calculations, 2024)

Figure 4 shows the results of The Impulse Response Function (IRF) analysis provides insights into how economic variables respond over time to a one-standard-deviation shock in household debt ($lnDEP_t$). The analysis examines the dynamic interactions among key variables: income ($lnINC_t$), GDP ($lnGDP_t$), and income inequality ($lnIEQ_t$). The results highlight short-term, medium-term, and long-term responses, offering a comprehensive understanding of the relationships within the economic system.

Response of Income ($lnINC_t$)

Short-Term (1–3 Periods): The shock in household debt initially causes a slight negative response in income. This suggests that an increase in household debt might constrain disposable income due to rising debt repayment obligations. Households with higher debt burdens are likely to reduce spending on productive activities, thereby impacting income generation negatively.

Medium-Term to Long-Term (4–6 Periods): The negative impact diminishes over time as households and the broader economy adjust. By the sixth period, income stabilizes, indicating that the economy has absorbed the shock and returned to equilibrium.

Response of GDP (*lnGDP$_t$*)

Short-Term (1–3 Periods): The shock in household debt leads to a negative response in GDP. This reflects the broader macroeconomic consequences of increased household debt, such as reduced aggregate consumption and investment. The contraction in economic activities in the short term is consistent with the tightening effects of rising debt levels.

Medium-Term to Long-Term (4–7 Periods): The negative effects gradually diminish, with GDP stabilizing by the seventh period. This adjustment demonstrates the resilience of the economic system, which is likely supported by structural recovery measures and adaptive economic behaviors.

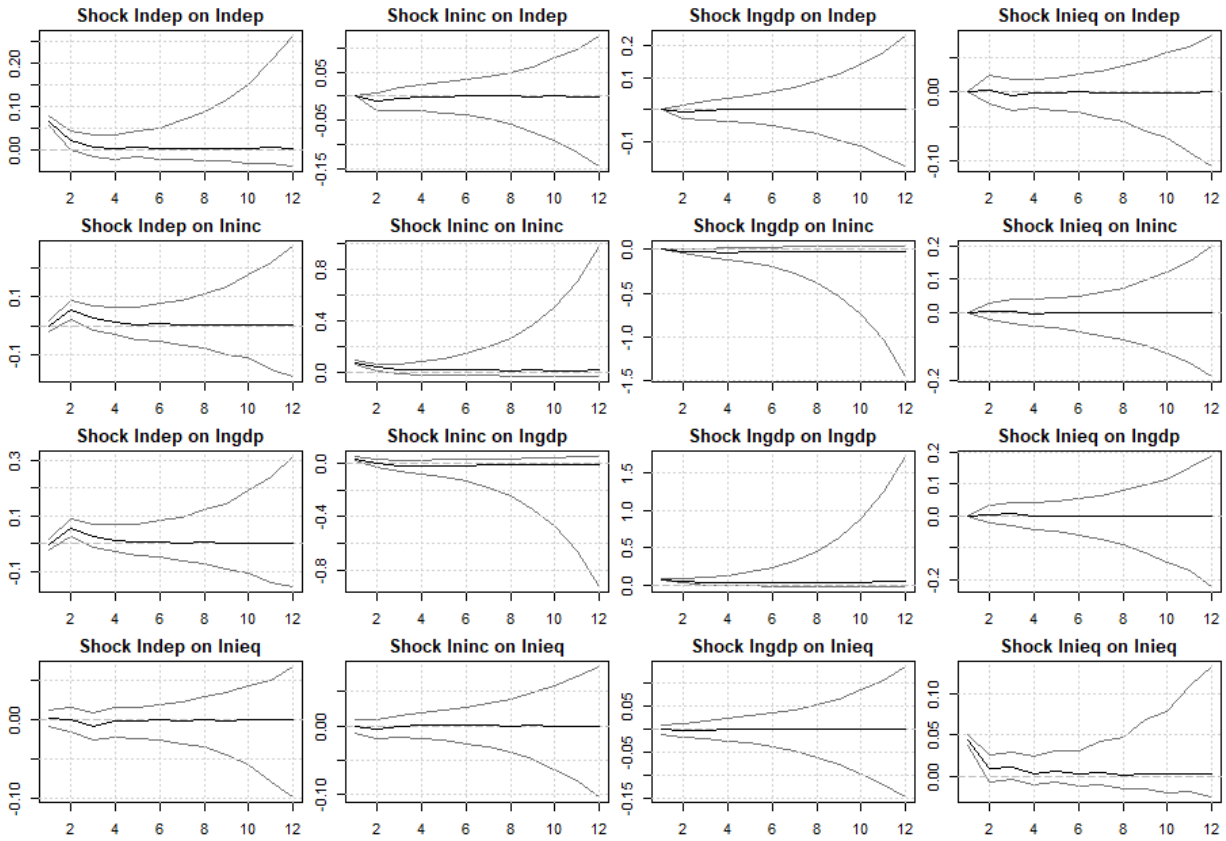

Figure 4 Impulse Response Function (IRF) Analysis Results
(Source: Calculations, 2024)

Response of Income Inequality (*lnIEQ$_t$*)

Short-Term (1–3 Periods): The shock in household debt causes a positive response in income inequality. This indicates that rising household debt exacerbates income disparities, potentially due to the disproportionate impact on low-income households. These households are more vulnerable to debt burdens, which further widen the income gap.

Medium-Term (4–6 Periods): The positive impact on inequality begins to subside as the economy adjusts. However, inequality remains elevated for several periods, highlighting the persistent effects of household debt shocks on the income distribution. Beyond economic inefficiencies, income inequality can also erode social cohesion and weaken the legitimacy of democratic institutions (Stiglitz, 2012).

Discussions

The research findings provide valuable insights into the complex and dynamic relationships between household debt, income, GDP, and income inequality in Thailand. These relationships underscore the interplay between financial stability, economic growth, and social equity, offering critical implications for policy and development.

The Persistence of Household Debt and Its Implications

The study reveals that household debt exhibits strong persistence over time, influenced significantly by its past values. This cyclical borrowing behavior reflects the structural dependence of households on debt to maintain their consumption levels. The positive relationship between income inequality and household debt further emphasizes the vulnerability of low-income households, who often resort to borrowing due to insufficient disposable income. Behavioral economics suggests that cognitive biases—such as present bias and overconfidence—can lead households to accumulate unsustainable levels of debt, even when future repayment risks are apparent (Bertrand & Morse, 2011). This reliance on debt can exacerbate financial stress and lead to a debt trap, particularly for households at the lower end of the income spectrum.

This finding aligns with previous studies, such as those by Iacoviello (2008) and Mian & Sufi (2014), which identified the interconnectedness of debt and inequality. Both studies highlighted how income disparities drive borrowing behavior, reinforcing systemic vulnerabilities in economies with high inequality levels. From a policy perspective, these findings highlight the urgent need for targeted interventions to address the root causes of excessive debt accumulation. Debt restructuring programs, financial literacy campaigns, and stricter lending criteria can help reduce the reliance on unsustainable borrowing, particularly among vulnerable groups.

The Role of Income and GDP in Promoting Financial Stability

The results demonstrate that income is a key driver of economic stability and growth. A positive relationship between income and GDP underscores the importance of household financial health in sustaining broader economic performance. However, the negative impact of household debt on income suggests that rising debt burdens can erode households' capacity to generate income, leading to adverse macroeconomic consequences.

GDP plays a dual role as both a driver and a beneficiary of household financial stability. While income positively influences GDP growth, excessive household debt poses a risk to economic performance by constraining consumption and investment. These findings are consistent with earlier research by Krueger & Perri (2006), which emphasized the critical role of household financial stability in driving consumption and investment.

Macroeconomic factors such as GDP and household income play critical roles in shaping income distribution and financial resilience. As Mingmaninakin (2013) emphasizes, sustainable economic growth and equitable income allocation are essential pillars in reducing structural inequality and promoting household financial stability.

Income Inequality as a Structural Challenge

Income inequality emerges as a persistent issue, amplified by rising household debt. The study reveals that inequality not only exacerbates borrowing but also limits the capacity of households to recover from debt shocks. The positive response of inequality to debt shocks in the Impulse Response Function (IRF) analysis highlights the disproportionate impact of debt

burdens on low-income households. This dynamic creates a feedback loop, where inequality drives debt accumulation, and debt, in turn, widens the income gap.

Addressing this structural challenge requires comprehensive policies aimed at redistributing income and providing equal opportunities for economic participation. This aligns with recommendations by Piketty (2014), who advocated for progressive taxation and policies promoting equitable access to education and resources to combat income inequality.

Resilience and Long-Term Adjustments

The IRF analysis highlights the resilience of income and GDP in response to household debt shocks. Although these variables experience short-term declines, they gradually stabilize, reflecting the adaptive capacity of the Thai economy. However, the persistence of income inequality underscores the limitations of economic recovery in addressing social disparities. While the economy may return to its equilibrium, the structural issues underlying inequality remain unaddressed. Persistent income inequality also impedes intergenerational mobility, creating structural barriers to economic advancement for children born into low-income families (Corak, 2013).

The study's findings align with broader international evidence regarding the cyclical relationship between household debt and income inequality. High levels of debt accumulation, particularly among low- and middle-income households, tend to reinforce economic vulnerability, especially in the face of financial or policy shocks (World Bank, 2020; Bank of Thailand, 2021). In Thailand, the rising household debt-to-GDP ratio has been flagged as a systemic risk that may hinder consumption and suppress productive investment, exacerbating long-term disparities (Bank of Thailand, 2021). This feedback loop — in which inequality leads to increased borrowing, and debt in turn deepens inequality — is also echoed in global research. For instance, the IMF (Dabla-Norris et al., 2015) emphasizes that higher inequality levels are correlated with slower, less durable growth trajectories.

Moreover, structural inequalities such as unequal access to education, healthcare, and credit contribute to persistent income gaps, even when macroeconomic indicators recover (United Nations ESCAP, 2022). The OECD (2019) further argues that unless inclusive growth policies are adopted, the middle class will continue to face downward mobility, potentially amplifying social instability. Taken together, these findings suggest that effective debt management strategies must be integrated with broader redistributive and inclusive policy measures to ensure long-term economic and social resilience.

These findings underscore the need for integrated strategies that combine macroeconomic stability with social equity. Policymakers should focus not only on fostering economic recovery but also on addressing the systemic factors that perpetuate inequality, such as unequal access to education, healthcare, and economic opportunities.

Conclusion and suggestions

This study investigates the dynamic relationships between household debt, income, GDP, and income inequality in Thailand, focusing on the interplay between these critical economic variables. The research stems from the growing concern over the rising levels of household debt in Thailand and its potential to exacerbate income inequality, hinder economic growth, and create vulnerabilities in the financial system. Addressing this issue is particularly relevant as Thailand transitions to a more developed economy, where equitable growth and financial stability are key objectives.

The primary objectives of this study are to explore 1) the impact of household debt on income inequality, 2) the role of income and GDP in mitigating household debt burdens, and 3) the dynamic adjustments among these variables over time. To achieve these objectives, this study employs a Bayesian VAR (BVAR) model to estimate the interrelationships among household debt, income, GDP, and income inequality using a 19-year dataset. Additionally, Impulse Response Function (IRF) analysis is conducted to assess the short-term and long-term responses of each variable to shocks in household debt.

This study highlights the complex and dynamic relationships between household debt, income, GDP, and income inequality in Thailand. The findings demonstrate the dual challenges of managing household debt and addressing income inequality while maintaining economic growth. Policymakers must prioritize integrated strategies that address these challenges to ensure sustainable and inclusive development. Future research should explore regional disparities, qualitative insights, and the effectiveness of specific policy interventions to further inform solutions for these pressing issues.

Recommendations for Applying Research Findings

1. Promote Fair Income Distribution: The study reveals that higher average household income helps reduce household debt and income inequality (statistically significant at the 95% level). The government should implement policies that support fair income distribution, such as developing a tax structure that alleviates the burden on low-income groups, investing in skill development and education programs to provide households with opportunities to increase their income and reduce reliance on debt. According to Atkinson (2015), a combination of progressive taxation, universal child benefits, and employment subsidies represents a practical toolkit for reducing income inequality in advanced and emerging economies alike.
2. Control Household Debt Growth: The study indicates that rising household debt leads to an increase in the income inequality index (statistically significant at the 95% level). Measures should be implemented to control debt accumulation, such as setting appropriate credit lending criteria, promoting savings, and providing financial literacy education to reduce the risks of excessive borrowing. Including promoting financial literacy has been shown to significantly improve household budgeting, reduce reliance on high-cost debt, and enhance long-term financial resilience (Lusardi & Mitchell, 2014).
3. Improve Economic Structure for Sustainable Growth: The study shows that an increase in gross national income tends to raise income inequality (statistically significant at the 90% level). Therefore, economic policies should focus on sustainable and equitable growth, such as promoting small and medium-sized enterprises (SMEs) and ensuring economic opportunities are accessible to all sectors of society to reduce inequality and foster balanced growth.
4. Regularly Monitor and Adjust Policies: The analysis using Impulse Response Function shows that household debt and the income inequality index respond quickly to changes in each other, indicating a complex and rapidly changing relationship in the economy. Continuous monitoring of policy impacts is essential, and measures should be adjusted according to evolving conditions.

Recommendations for Future Research

1. Include Additional Economic and Social Variables: Future studies should incorporate other variables that may affect income inequality and household debt, such as unemployment, interest rates, education levels, and government policies, to gain a more comprehensive understanding of the factors influencing these relationships.

2. Study Regional Impacts: Income inequality and household debt may vary by region within Thailand. Future research should analyze regional-level data to understand specific factors that might impact each area, such as differences in economic structures, access to resources, and employment opportunities.
3. Use Qualitative Research Methods: In addition to quantitative models, qualitative research methods such as interviews or case studies should be considered to explore the experiences and perspectives of households affected by income inequality and debt. This will provide deeper and more comprehensive insights.
4. Study the Impact of Specific Policies: Future research should focus on studying the effects of specific economic policies, such as fiscal policies, monetary policies, or social welfare programs, to evaluate the effectiveness of these policies in reducing income inequality and controlling household debt.
5. Test Alternative Models: To validate the study's findings, other econometric models such as Structural Equation Modeling (SEM) or spatial econometric models should be considered. These models may provide a clearer and more detailed picture of the relationships between different variables.

New knowledge and the effects on society and communities

New knowledge derived from research plays a crucial role in shaping economic and social development, particularly in areas related to household debt, income inequality, and economic growth. The findings from such studies are not merely academic insights but also serve as a foundation for policymaking, financial education, and community-level economic development.

One of the most significant impacts of new knowledge is its ability to help governments formulate more effective policies. Research that analyzes the relationship between household debt and income inequality reveals structural issues affecting the national economy. These insights enable policymakers to implement appropriate measures, such as designing fairer tax structures, promoting debt restructuring programs, and strengthening financial regulations to prevent excessive household debt.

Moreover, new knowledge enhances public financial literacy, enabling individuals to manage their personal finances more effectively. Studies on the effects of household debt on income and economic stability can lead to financial education campaigns, helping households adopt responsible borrowing and saving strategies. Raising awareness about financial planning, investment, and debt management can reduce the risk of falling into chronic debt and contribute to long-term economic security.

At the community level, research findings can guide the design of economic development programs tailored to specific local needs. Analyzing data on income inequality allows local authorities to create policies or initiatives that promote economic opportunities for disadvantaged groups. For example, supporting community enterprises or providing microfinance for low-income entrepreneurs can help reduce disparities and stimulate grassroots economic growth.

In the long run, new economic and social knowledge contributes to overall economic stability. When policymakers can use in-depth research to implement precise economic solutions, individuals make more informed financial decisions, and communities have the tools to develop their local economies, society becomes more resilient. Economic research is not just theoretical but plays a fundamental role in fostering sustainable development and ensuring a more equitable future for all.

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