The Relationship Between Domestic Debt, Household Consumption and COVID-19 Impact: The Case of Thailand
ความสัมพันธ์ระหว่างหนี้ในประเทศ การบริโภคในครัวเรือน และผลกระทบจากโควิด-19: กรณีศึกษาในประเทศไทย

Adriano Prates do Amaral[1] and Chawin Thammanankul[1]
อาเดรียโน่ ปราเตส ดู อามารัล[1] และ ชวินท์ ธัมมนันท์กุล[1]
[1]Bachelor in Business Administration (International Business Management), Eastern Asia University
[1]บริหารธุรกิจบัณฑิต (สาขาการจัดการธุรกิจระหว่างประเทศ) มหาวิทยาลัยอีสเทิร์นเอเชีย
Received: April 24, 2025
Revised: June 4, 2025
Accepted: June 4, 2025

Abstract

This study explores the relationship between public debt and household consumption in Thailand during the period between 2005 and 2024, with an added focus on the impact of the COVID-19 pandemic on the relevant factors. The research employs Autoregressive Distributed Lag (ARDL) and Segmented Regression. The study demonstrates that public debt positively and significantly affects household spending, with the impact taking place within two to four quarters after policy implementation. The segmented regression analysis shows that the relationship between public spending and individual consumption weakened in the period post-COVID, revealing that the effectiveness of public debt as a stimulus to consumption was reduced after the event, implying that debt may be approaching critical levels that could affect economic stability. These findings emphasize the need for appropriate fiscal policy to balance short-term economic stimulus and long-term fiscal stability.

Keywords: Public debt; Household consumption; COVID-19; Thailand

บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อสำรวจความสัมพันธ์ระหว่างหนี้สาธารณะและการบริโภคของครัวเรือนในประเทศไทยระหว่างปี 2548 ถึง 2567 โดยเน้นผลกระทบของการระบาดใหญ่ของโควิด-19 ที่มีต่อปัจจัยดังกล่าว งานวิจัยใช้การวิเคราะห์เชิงสถิติแบบ Autoregressive Distributed Lag (ARDL) และ Segmented Regression ผลการศึกษาพบว่าหนี้สาธารณะส่งผลกระทบเชิงบวกและมีนัยสำคัญต่อการใช้จ่ายของครัวเรือน โดยผลกระทบเกิดขึ้นภายในสองถึงสี่ไตรมาสหลังจากการดำเนินนโยบาย อย่างไรก็ตาม ความสัมพันธ์ระหว่างการใช้จ่ายภาครัฐและการบริโภคส่วนบุคคลอ่อนแอลงในช่วงหลังวิกฤตโควิด-19 สะท้อนให้เห็นว่าประสิทธิภาพของหนี้สาธารณะในการกระตุ้นการบริโภคลดลง ผลการวิจัยบ่งชี้ว่าระดับหนี้สาธารณะของประเทศไทยอาจเข้าใกล้จุดที่อาจส่งผลกระทบต่อ

เสถียรภาพทางเศรษฐกิจ ซึ่งเน้นย้ำถึงความจำเป็นในการกำหนดนโยบายการคลังที่เหมาะสมเพื่อรักษาสมดุลระหว่างการกระตุ้นเศรษฐกิจและความมั่นคงทางการคลังในระยะยาว

คำสำคัญ: หนี้สาธารณะ; การบริโภคในครัวเรือน; โควิด-19; ประเทศไทย

Introduction

Household consumption is a fundamental macroeconomic factor determining the performance of an economy, including Thailand. When households spend money on goods and services, they create a stimulus in demand that in turn increases business production and income, improving general levels of employment, and government revenue via taxes. This creates a positive effect throughout a country's economy initiating a new cycle of economic expansion (Mian, Sufi & Verner, 2017).

On the other hand, variations in household spending may generate instability in consumption-based economies. Those variations are usually linked to other macroeconomic factors such as government debt, cost of living, import and export of goods and services, foreign direct investment, fixed capital formation, taxation, and others. Among these, government debt plays a very important role, affecting private consumption confidence, disposable income, and long-term general economic stability. Those effects are influenced by governments need to source more resources, mat erializing in the form of higher taxes or reduced public consumption, which in turn will reduce households purchasing capability. The threat of excessive growth of government debt is one of the largest concerns regarding an economy sustainability, that potentially could reduce overall economic activity, including household consumption (Reinhart and Rogoff, 2010; Égert 2015).

The recent COVID-19 economic downturn had an additional negative impact on economic stability. In Thailand, and around the world, the government increased spending in order to stimulate the economy during and after the COVID-19 outbreak, significantly expanding public debt to support the private sector purchasing power, including both businesses and households, and also to support public health initiatives. Those measures although necessary also brought about a higher debt-to-GDP ratio, escalating the pressure on public debt the consequent economic stability. This situation could make households more cautious regarding their spending, negatively impacting the private sector sales and the economic growth in general and, as a consequence, lead to stagnation and recession (Baker, Farrokhnia, Meyer, Pagel & Yannelis, 2023; Carvalho, Garcia, Hansen, Ortiz, Rodrigo, Rodriguez Mora & Ruiz, 2021).

In respect to current debt levels, there is a growth trend of Thailand's public expenses, which led to a total debt of almost 12 trillion-baht by the middle of 2024, representing about 64 percent of the GDP that year. Although relatively high, these results are still below the pre-determined ceiling of 70 percent of the GDP, indicating that Thailand's debt level was still within sustainable limits (PRD, 2024). However, recent projections by the National Economic and Social Development Council (NESDC) show that public debt could

reach about 69 percent of GDP by the end of 2029, increasing the potential for future economic instability (Nation Thailand, 2025).

Given these circumstances, any further growth in Thailand's public debt could have a multiplying repercussion on household consumption. As a consequence, Thai policy makers should consider adjusting the fiscal policy, in order to improve revenue and expanding borrowing to meet debt repayment obligations. However, there is a possibility that those adjustments could constrain household spending by shifting the financial cost of managing the debt onto the general population.

In summary, while Thailand's current public debt is sustainable as long as it remains within statutory limits, it is necessary to monitor its level and implement a fiscal reform that would allow the government to support its activities without increasing the pressure on household consumption and, by extension, on economic growth.

Objective

This study aims to identify the effects of government debt on household consumption in Thailand during the period between 2005 and 2024, taking into account the impact of the COVID-19 pandemic on those variables. The clear understanding of this relationship is fundamental to determine the impact of unforeseen crisis, such as pandemics, on the economy and how that knowledge could help to develop stimulus policies that simultaneously improve economic growth and reduce economic instability. It is well known that the COVID required urgent fiscal interventions by governments around the world, which started launching initiatives to support private consumption and stimulate a speedy recovery. However, these measures added to the rising of public debt, increasing global concerns about long-term growth and the sustainability of those policies.

For Thailand this is particularly important because public debt approaches its critical threshold of 70 percent of GDP, as discussed in the previous section, an outcome that would reduce the country's capability to create sustained economic growth. Therefore, in face of these challenges, it is fundamental to understand the interplay of these factors, household consumption, government debt, and COVID-19 impact (as a proxy for unforeseen crises), so that the gained knowledge could help design targeted fiscal strategies that would avoid the most common negative effects of fiscal policies, such as reduced consumer confidence, slow recovery, and risk of economics instability. In this regard, the objective of this study is twofold:

a) Determine the impact of government debt on household consumption in Thailand

b) Determine the influence of the COVID-19 pandemic, including the period post outbreak, on the dynamic between government debt and household consumption.

The general expectation is that this research outcomes will contribute to the existing literature, particularly regarding the impact of government stimulus initiatives during and post-COVID in Asian and emergent countries. In order to fulfil that gap, this research outcomes will provide insights into whether public debt bolstered households' purchasing power before and after the pandemic. The gap in the literature is a consequence of the COVID-19 pandemic being such a recent event, as most of the research available on household consumption and government debt in Asia and Thailand employs data from before 2020.

Additionally, it will explore the timing and delayed effects of such policies, as well as their sustainability in the face of rising public debt levels. The authors anticipate that this knowledge will help policymakers to design more effective fiscal interventions that can support private consumption in a sustainable manner.

Literature review

Household consumption is a critical factor utilized in several economic studies that aim to determine how individual impact economic performance. Its importance derives from the key role that household spending plays on economic growth: purchasing power of households drives demand on goods and services, therefore generating both income for firms and the government. Fast changes in consumption patterns could signal changes in households' confidence, income, or saving trends. As a result, during economic downturns households may reduce consumption, which can worsen the overall performance of an economy.

Impact of public debt on growth and income

Kaplan and Violante (2014) explore the role of liquidity constraints and the response time to government stimulus policy. They developed a model used to understand how households respond to fiscal stimulus and found that 25 percent of the stimulus is used to consume nondurable goods on the first 3 months after payment. They concluded that fiscal injections can be very effective regardless of the household level of income and can stimulate economic growth.

Attanasio and Pistaferri (2016) investigate trends in consumption inequality and its relationship with income inequality. They found that consumption inequality is more relevant than income inequality when determine the impact of stimulus policies, and even low-income households may smooth consumption. Carroll, Slacalek, Tokuoka, & White (2017) highlight how belonging to specific income groups has an impact wealth distribution and marginal propensity to consume (MPC): low income households spend the stimulus payment almost immediately, while higher income household smooth consumption.

Several different channels enable the influence of public debt on household consumption, and this stimulus may either increase or decrease household spending.

Expansionary effects that lead to higher consumption may occur by directly influencing income, known as fiscal stimulus. Governments may borrow to finance transfers to households in the form of unemployment benefits or stimulus checks, or tax reduction, increase disposable income and, as a consequence, consumption. Hagedorn, Manovskii, & Mitman (2019) discuss the impact of stimulus checks during recession periods in the United States and confirm that household spending increases as a result, in specially in low income households. Additionally, Fagereng, Holm, & Natvik (2021) observe that those low-income households have a higher marginal propensity to consume (MPC) for the extra income.

The multiplier effect from government spending is another form of expansionary force on consumption. Infrastructure projects and any other type of public services funded by debt may have an indirect effect on households' income by raising wages. Guren, Nakamura, & Steinsson (2018) show that during recessive periods government spending has a larger multiplier effect, implying an expansion in consumption.

On the other hand, contractionary effects generate lower consumption. The crowding out impact on private credit occurs when higher government debt increases long-term interest rates, raising mortgage and loan costs and therefore reducing the spending of households.

Reinhart and Rogoff (2010) demonstrate that high public debt levels are associated with slower economic growth, which can suppress household consumption. After analyzing 44 countries over 200 years they concluded that when debt exceeds 90 percent of GDP growth slows down very fast. Additionally, advanced economies are more resilient to debt than emerging economies, and the last group suffers recessions at a lower threshold.

Similarly, Égert (2015) examines the existence of a nonlinear relationship between public debt and economic growth. The author found that the relationship changes with different economic contexts and while high debt may harm growth, the threshold varies across countries. In the paper he advised policy makers to take a more nuanced approach, measuring specific local conditions in order to determine debt sustainability. Morina, Misiri, Alijaj (2024) also reveal a nonlinear relationship between government debt and household consumption in 26 OECD member countries. When debt levels are low to moderate, below 60 percent of the GDP, they have a positive or neutral effect on consumption. However, high debt levels, above 90 percent of GDP, reduce consumption.

Alesina, Favero, & Giavazzi, (2019) found that the design of a fiscal adjustment plays a fundamental role on its impact, and that fiscal austerity may also create growth. They showed that spending cuts are less damaging to an economy than tax increases, emphasizing that tax increases on labor and capital reduce growth more persistently. They suggested that governments should prioritize structural spending reforms. However, Bato & Viray (2024) suggest that the negative effect found in Alesina et al. (2019) may be less significant during recessions or if government spending enhances productivity.

Additionally, Fatás & Summers (2018) show that fiscal austerity has permanent negative impact on economic growth. They demonstrated in a study involving OECD countries that there is a correlation between spending cuts and lower GDP that may last over more than 10 years. The authors argued that during economic downturns, public debt can help maintain household consumption levels. This is particularly important in the context of the present study, where COVID-19 plays the role of a negative influence on consumption.

Related studies in Thailand and Asia

Regarding research focusing on Asia and Thailand, Tan, Mohamed, Habibullah, & Chin (2020) studied the effects of both monetary and fiscal policies on the economic growth of three ASEAN nations from 1990 to 2018: Malaysia, Singapore, and Thailand. They found that, in general, government spending has a more direct and positive effect on growth, in particular in Thailand, with the highest impact amongst the three countries. Monetary policy has a weaker effect, with Singapore being the country more responsive to this type of policy. They advised that fiscal policy is more efficient when the objective is short-term growth. However, they emphasize that structural reforms would improve the efficiency of both policies types.

Uprasen (2022) explores the effects of government debt on Thailand's economy from 2002 to 2019 and found a nonlinear relationship

between government debt and economic growth. Moderate public debt, defined by the author as below 60 percent of the GDP, will have a neutral or positive short-term effect on growth, while high debt of more than 60 percent of the GDP will negatively impact growth, probably because of crowding-out effects and higher borrowing costs. The author advised that while debt has a positive short-term impact, the weight of long-term debt may reduce future economic performance. Rising debt levels also exert upward pressure on interest rates and inflation, while negatively impacting private investment by reducing access to credit. Both of the studies above adopt the ARDL approach. However, they focus on the period before COVID-19 had any impact.

Tangkanjanapas, Thamma-Apiroam, and Dheera-aumpon (2020) investigate the impact of public debt on Thailand's economic growth using quarterly data from 1998 to 2017 and found a non-linear relationship between the public debt and economic growth. They set-up their threshold at 48 percent public debt-to-GDP ratio and suggest that while initial increases in public debt may stimulate growth, excessive debt levels can hinder economic performance. They argued that initially public debt has a stimulating effect on growth, which is reduced after the threshold and becomes critical after 80 percent, giving as example the 1997 Asian Financial Crisis.

Chaisaard (2021) examines the relationship between public debt and Thailand's economic growth from 2005 to 2019. As in Tangkanjanapas et al. (2020) and Uprasen (2022), this author revealed the existence of a U-shaped relationship between debt and growth, supporting the gradual reduction in public dept effectiveness to stimulate economic growth. Also, similarly to other studies in this literature review, there is an optimal debt range, within 30 to 50 percent of GDP, where is a positive impact on economic growth occurs, with the optimal level being around 40 percent, and with a sharp decline after 50 percent debt-to-GDP, with stagnation settling after 60 percent. Additionally, the author points a differentiation between productive debt, in infrastructure and education, and unproductive debt, like subsidies and debt servicing.

Summary

Household consumption is considered as a fundamental driver of economic growth and development, stimulating the demand for goods and services and, as a result, increasing income for households and businesses. Every time that household confidence, income, or savings change, consumption patterns suffer a direct impact, consequently affecting the whole economic performance. This impact is particularly important during economic downturns, where it could increase the negative consequences of a recession.

Additionally, the findings from the literature emphasize that a moderate level of public debt can help to stimulate the economy, while excessive debt may reduce consumption by households. The positive effect of public debt is mostly relevant for low-income households, that usually have a high marginal propensity to consume (MPC). The findings from Thailand studies confirm the general international patterns, with optimal public debt found to be between 40-50 percent of GDP. However, the data utilized in those studies is from before the COVID-19 outbreak, a gap in knowledge that the present study aims to fulfill.

Methodology

The main purpose of this study is to describe the impact of public debt on household final consumption in Thailand before and after the COVID-19 outbreak utilizing regression analysis. Therefore, in order to determine the soundness of the basic correlation, additional independent macroeconomic factors will be included as control variables to measure the strength of the correlation between those two major variables and the soundness of the model. The control variables are gross fixed capital formation, foreign direct investment, export of goods and services, consumer price index, gross domestic product, and total tax revenue.

This study uses time series data from a variety of secondary sources: consumer price index (CPI) from the Bureau of Trade and Economic Indices, Ministry of Commerce Thailand, public debt outstanding from Public Debt Management Office of Thailand, tax revenue from the Revenue Department, Ministry of Finance Thailand, the Gross Domestic Product and individual consumption expenditure of households from the Office of The National Economic and Social Development Council, and gross fixed capital formation, export of goods and services and foreign direct investment from the Bank of Thailand. The data under analysis range from the first quarter of 2005 to the third quarter of 2024 (fourth quarter of 2023 for tax revenue), resulting in a total of 76 observation points. The period influenced by the COVID-19 pandemic (including the pandemic itself and the subsequent quarters) includes all quarters from the first quarter of 2020 to the third quarter of 2024, in a total of nineteen observation points.

Household consumption is the dependent variable, with the assumption that the independent variables, particularly public debt, have a significant influence on the performance of final household expending. The research model is represented below:

$$HCE_{i,t} = \alpha_i + \beta_1(TPD_{i,t-1t}) + \beta_2(GFCF_{i,t-1}) + \beta_3(FDI_{i,t-1}) + \beta_4(EXGS_{i,t-1}) + \beta_5(TTR_{i,t-1}) + \beta_6(\Delta GDP_{i,t-1}) + \beta_7(CPI_{i,t-1}) + \beta_8(COV_{i,t-1}) + \varepsilon_i \quad (1)$$

Household consumption expenditure (HCE) is the total spending by households on goods and services for personal use. Consumption expenditure directly affects demand growth: as demand expands, the business sector increases their production and profitability, positively impacting profitability, employment, and tax revenue (Bato & Viray, 2024). Household consumption expenditure is the study dependent variable and is included in the main equation as the natural logarithm of the individual consumption expenditure of households in Thailand.

Total Public Debt (TPD) is the total outstanding debt owed by the government, including domestic and external debt. TPD impact on household consumption is determined by the pressure that high levels of public debt exercise on interest rates, which in turn reduces private investment and, as consequence, reduce disposable income and consumption. Additionally, if households anticipate future tax increases to pay public debt, they may reduce current spending and increase savings, known as Ricardian equivalence (Égert, 2015; Reinhart and Rogoff, 2010). However, increased public debt can stimulate household consumption in the short

term and long term. For instance, expansionary fiscal policies funded by borrowing can increase disposable income, thereby boosting consumer spending (Mian et al., 2017). Total public debt is the major independent variable in this study and it is included in the regressions as the natural logarithm of the total public debt outstanding, including both external debt and domestic debt

Gross Fixed Capital Formation (GFCF) is the investment in physical assets such as infrastructure, buildings, and machinery. High levels of GFCF can help to expand productivity and consequently income levels. However, if GFCF is financed mostly by borrowing it may inflate interest rates, reducing loan opportunities, either increasing their debt or reducing their disposable income.

Foreign Direct Investment (FDI) includes all investments made by foreign companies or other entities in local businesses and assets. FDI may increase household consumption by upgrading domestic salaries and wages, developing human capital, creating jobs, and improving productivity and competitiveness. However, if FDI is concentrated in capital-intensive industries, its impact on household consumption may be limited.

Consumer Price Index (CPI) measures the rate of prices increase in terms of a standard basket of goods and services. Inflation directly affects purchasing power by reducing disposable income in the short-term. In the long-term inflation may reduce households' confidence on economy stability, leading to reduced consumption of durable goods.

Export of Goods and Services (EXGS) are all goods and services produce domestically but are sold and consumed in another country. EXGS contribute to the consumption of households by increasing income via salaries, wages, and employment. However, if exports revenue is concentrated in the hands of a limited number of companies or individuals, its benefits may be minimal.

Total Tax Revenue (TTR). Tax revenue is a fundamental source of government income used to support public programs that directly or indirectly increase household income. However, high taxes may reduce disposable income, therefore limiting consumption.

Gross Domestic Product (GDP) is the sum of the overall economic activity in a country during a period of time, usually a year. Higher GDP typically leads to higher income levels, employment, and consumer confidence, all of which support household consumption. However, if GDP growth (ΔGDP) is unevenly distributed, its impact on consumption may be limited.

COV is a dummy variable for the post-COVID-19 pandemic and assumes the value of 1 in the quarters post-COVID outbreak, and 0 otherwise. The post-COVID period includes every quarter from 2020 up to 2024. COV will be employed to determine if there are differences in household consumption in the periods before and after COVID-19. Because the COVID-19 had a general negative impact on consumption, the expectation is that the coefficient for COV will be negative.

The variables relationship over time will be analyzed using the Autoregressive Distributed Lag (ARDL) approach, which testing procedure can determine whether a long-run relationship exists between household consumption and government debt (and the other control variables). This is particularly useful for understanding whether government debt has a sustained impact on consumption patterns.

ARDL models work by including lagged values of the independent variables, capturing how, in our case, household consumption adjusts over time in response to changes in public debt. One advantage of the ARDL model is that by including lagged values of variables, the approach reduces the risk of endogeneity, which is common in models involving time series of macroeconomic variables like household consumption and public debt. Furthermore, the approach is better adapted for smaller samples, between 30 to 80 observations (Canakci, 2021).

In order to carry out the analysis related to the impact of the period pos-COVID, this study will employ segmented regressions to each of the independent variables influencing household consumption, as a means to determine the overall effect of the COVID-19 pandemic, including the period after the outbreak. Segmented regression, also known as piecewise regression, is a statistical technique used to model data that shows different linear or nonlinear relationships across distinct intervals or segments of the independent variable (Hansen 2017, Phillips & Shi 2019).

This method is useful when the relationship between the dependent and independent variables changes at specific points, called breakpoints or knots. For the purposes of this study, it was determined that the COVID-19 outbreak is the breakpoint to be analyzed and it is expected that there will be significant differences between the two periods for at least some of the macroeconomic factors of interest. By dividing the data into segments and fitting separate models to each segment, before and after COVID, segmented regression can capture complex, non-uniform patterns that a single broad model potentially could not detect (Tuna, Evren, Şahinbaşoğlu, & Veznikli 2023).

In order to determine the validity of the overall assumption in the study, six econometric tests are employed: (1) linear regression (ordinary least squares–OLS), (2) random effects (generalized least squares–GLS), (3) fixed effects (generalized least squares–GLS), (4) Arellano-Bond estimator (generalized method of moments–GMM), (5) Arellano-Bover/Blundell-Bond estimator (generalized method of moments–GMM), and the (6) generalized estimating equations (GEE) model (Morina et al. 2024). As a precaution used to reduce effects from dispersion, multicollinearity and heteroscedasticity in the series, all continuous variables were converted to their natural logarithms, while CPI, ΔGDP and COV are introduced in the regression as discrete variables. The regression models were tested for autocorrelation utilizing the most suitable test available in the STATA software.

All the models in the study are estimated employing the STATA software and the outcomes are presented in Table 1, Table 2 and Table 3.

Statistical Analysis and Discussion

Table 1 presents the econometric outputs of the tests used in the study, which analyzed the impact of the target macroeconomic factors on household final consumption in Thailand during the period between 2005 and 2024 (2023 for total taxes).

The Breusch-Godfrey test was employed for the OLS and no significant autocorrelation in the residuals was found. This last test has the capability of detecting autocorrelation up to any pre-assigned lagged independent variable. The Wooldridge test was used for the GLS models with random and fixed effects and displayed no significant autocorrelation. Similarly, the Sargan-Hansen test shows no autocorrelation in

the variables for the GMM and GEE models.

The outcomes from the equation (1) in Table 1 demonstrate that all models are significant at 1 percent and the majority of variables are statistically significance at 1 percent or 5 percent. For the purposes of this analysis the focus will be on the Generalized Least Squares (GLS) random effect regression, model [2]. This approach is useful when autocorrelation or heteroskedasticity may occur, particularly if there is a possibility of unobserved heterogeneity or time-varying effects that are not captured by the model's explicit variables.

The central independent variable in the model, TPD, is positive and significant at 1 percent, as observed in Table 1. This result confirms that public spending in Thailand generate an incentive to consumption during the period under study, confirming the stimulus effect of public debt on household spending. Total taxes revenue (TTR) was also positive and significant at 1 percent, supporting the assumption that taxes during the period under analysis were able to support the public sector activities without significantly reducing household income.

The EXGS and ΔGDP coefficients are both positive and significant at 5 percent. These outcomes demonstrate the importance of exports of goods and services as an income facilitator in Thailand. Additionally, the positive impact of Gross Domestic Product growth on consumption is expected according to the literature. On the other hand, both CPI and COV are negative and significant at 5 percent. In general inflation has a counteractive impact on households, as it reduces consumption by eroding purchasing power, increasing uncertainty, and making goods and services less affordable, leading to tighter budgets and reduced spending. The COVID-19 dummy negative coefficient indicates that the pandemic reduced consumption by households in a significant manner. However, it is not clear if there is any positive effect of government spending to mitigate this impact.

The variables GFCF and FDI did not show a significant impact on household consumption during the period under analysis. Gross fixed capital formation had a slighter larger influence on private spending, especially when the general results of all models in Table 1 are considered together. Nevertheless, the highest significance is only 10 percent in some approaches, but not significant in the GLS random effects regression.

Table 1

Econometric results of statistical tests models

Variables	Linear Regression (OLS)	Random Effects (GLS)	Fixed Effects (GLS)	Arellano -Bond estimator (GMM)	Arellano -Bover estimator (GMM)	Generalized Estimating Equations (GEE)
HCE	-	-	-	.492	.684	
				0.000***	0.000***	
TPD	.208	.116	.213	.165	.051	.193
	0.003***	0.000***	0.002***	0.006***	0.069*	0.000***
GFCF	.125	.124	.094	.059	.092	.097

	0.082*	0.165	0.074*	0.356	0.129	0.074*
FDI	-.004	-.004	.001	.002	.007	-.004
	0.807	0.991	0.829	0.936	0.638	0.362
EXGS	.446	.385	.325	.052	.306	.393
	0.020**	0.023**	0.016**	0.163	0.038**	0.021**
TTR	.143	.161	.149	.170	.169	.148
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
CPI	-.005	-.007	-.004	-.004	-.003	-.004
	0.018**	0.000***	0.015**	0.034**	0.035**	0.001***
ΔGDP	.456	.295	.269	.0975	.058	.263
	0.000***	0.018**	0.034**	0.371	0.092*	0.008***
COV	-.035	-.051	-.024	.047	-.0388	-.03187
	0.003***	0.000***	0.017**	0.012**	0.021**	0.000***
Observations	76	76	76	72	56	76
F-value:	271.67		102.59			
	0.000		0.000			
Wald chi2		1372.52		1506.21	1974.45	1663.57
		0.000		0.000	0.000	0.000
R-squared	0.9510	0.9501	0.9413	0.9034	0.8842	0.9271
Breusch-Godfrey	0.0983					
Wooldridge		0.1440	0.1699			
Sargan-Hansen				0.2819	0.2067	0.1977

Dependent Variable: Household Consumption Expenditure (HCE)

*,**,*** denote significance at 10%, 5% and 1% respectively

Table 2 shows the outcomes for the equation (1) ARDL regression (adapted from Canakci, 2021). Total public debt (TPD) has a positive lagged effect on household consumption, with exception of the first lagged TPD. Both, the two-lagged and four-lagged coefficients are significant at 5 percent level, and the three-lagged TPD is significant at 1 percent level. This result emphasizes a slightly delayed effect of public debt on individual spending, with household consumption being more responsive to government spending from two to four quarters after the event. This means that in Thailand, during the period under investigation, government efforts to improve consumption of individuals did not have an instant effect, on the first quarter, but took at least one additional quarter to establish enough confidence to influence households purchasing, with government spending having a more gradual effect in the short to medium-term.

Three studies support a time-frame of two to four quarters for government spending impacting household consumption. Ramey (2019) showed that the effect of government debt-financed spending on household consumption can occur within 4 to 12 months if the spending is direct and targeted.

Auerbach & Gorodnichenko (2017) found that government debt-financed spending has a faster and larger impact on household consumption during recessions, with effects materializing within the same period as Ramey (2019). Blanchard (2019) reached a similar conclusion and suggested that government debt can increase household consumption relatively quickly (6 to 12 months) if crowding-out effects are minimal.

EXGS had a comparatively slower impact on household consumption, on the three and four-lagged periods. Income generate by exports may take a longer cycle to reach households, and the effect is not immediate. Studies confirm that in many cases trade and export growth in developing countries increase household income and consumption, particularly in labor-intensive sectors, with effects materializing within 6 to 18 months (Dieppe, Guénette, Ha, Kindberg-Hanlon, Kirby, Nagle, & Ye, 2020; Gabriele, 2006) or even longer as the full multiplier effect, including indirect impacts through supply chains and local businesses, may take 1 to 2 years to materialize (Kee & Tang, 2016).

The coefficients of inflation, CPI, are both negative, showing an inverse relation between inflation and household debt. Their effect is restricted to the very short-term, on the one and two-lagged periods, with a significance at 1 percent in the first lag, and at 5 percent in the second lag. Coibion, Gorodnichenko & Weber (2022) found that households reduce consumption of durable goods when they believe inflation will be higher in the future, within a time span of 3 to 6 months. This occurs because households' confidence in their future purchasing power is reduced, affecting their perception of future income and future spending. Additionally, Miyajima (2024) analyzed the impact of inflation on consumption in emerging countries and found that household consumption in those countries plunge dramatically within 3 to 6 months after prices of food and energy increase.

Total tax revenue (TTR) has a similar profile to total public debt (TPD), the largest difference being the four-lagged period, that for TTR has only a 10 percent significance, below this study threshold for inclusion in the analysis. The two-lagged period has a significance of 5 percent, and the three-lagged has a significance of 1 percent. The mirroring in results between TTR and TPD could be explained by the use of tax revenues to support public services and social benefits, therefore funding government debt. Agarwal, Koo, & Qian (2022) found in Singapore that cash transfers funded by tax revenues generated a significant increase in household consumption of non-durable goods within 3 months to a peak in 6 months. Hagedorn, Manovskii, & Mitman (2019) explain that unemployment benefits and other social transfers funded by tax revenues helped maintain household consumption levels during recessions, with effects visible within 6 months.

Table 2

ARDL Regression

Variables	Coefficient	t-value	Significance
TPD (-2)	.466	2.42	0.012**
TPD (-3)	.709	4.27	0.000***
TPD (-4)	.415	2.24	0.031**
EXGS (-3)	.416	2.12	0.039**
EXGS (-4)	.331	2.03	0.047**
CPI (-1)	-.010	-2.91	0.005***
CPI (-2)	-.007	-2.26	0.028**
TTR (-2)	.165	2.22	0.028**
TTR (-3)	.182	2.74	0.008***
TTR (-4)	.081	1.79	0.079*
ΔGDP (-2)	.420	3.15	0.003***
ΔGDP (-3)	.353	-2.26	0.028**
ΔGDP (-4)	.152	1.73	0.090*
COV (-1)	-.051	-2.23	0.029**
Number of observations: 72			
F-value: 156.63			
F (sig.): 0.0000			
R-squared: 0.9714			
Adj R-squared: 0.9674			
Breusch-Godfrey Test: 0.3228			

Dependent Variable: Household Consumption Expenditure (HCE)

*,**,*** denote significance at 10%, 5% and 1% respectively

GDP growth (ΔGDP) reproduces almost directly the profile of TTR, with 1 percent significance on two-lagged period, 5 percent significance for three-lagged period, and a low 10 percent significance for the final lag. The literature has mixed results regarding the timing between ΔGDP and its impact on household consumption. According to Carvalho, Ferrero, & Nechio (2016) the speed at which ΔGDP leads to higher income and consumption depends on how quickly income growth translates into disposable income for households. The authors calculated a delay between three quarter up to two years caused by both labor market conditions and wage-setting conditions such as collective bargaining power, regulations, market forces, and others. In addition, Alvaredo, Chancel, Piketty, Saez, & Zucman, (2017) found that the impact of GDP growth on household consumption is likely to be inconsistent, as higher-income households receive the highest benefits from the growth and, because of their lower marginal propensity to consume, the final impact on consumption may be delayed or subdued.

Finally, the dummy variable for COVID-19, COV, implicates that the pandemic

and post-pandemic slowdown had an immediate impact, stronger on the one-lagged period. The one-lagged coefficient for COV is significant at 5 percent and negative, indicating that COVID depressed consumption very fast, a result that is not surprising. The speed of the impact of COVID varies in the literature, as lockdowns, job losses, and uncertainty led to sharp declines in spending. The timing and magnitude of this impact differed across countries and sectors, but the effects were generally felt within weeks to a few months from the beginning of the pandemic. Baker at al. (2023) show that household consumption suffered because of job losses, reduced working hours, and income uncertainty, strongly impacting lower-income households. These effects materialized within 1 to 3 months of the pandemic's outbreak, as households were forced to adjust spending in response to income shocks. Carvalho et al. (2021) demonstrate that the increased uncertainty about the future during COVID led households to both save more and spend less, practicing precautionary saving due to uncertainty about future income and expenses. This behavior sharply reduced consumption, with effects becoming visible within 2 to 4 months of the outbreak. They emphasize that declines in household consumption continued longer after the outbreak.

Table 3 shows an additional exploration of the relationship between the macroeconomic variables of interest in the study, particularly total public debt (TPD), and their effect on household consumption during the period between 2005 to 2024. The segmented regression employs the COVID-19 outbreak, at the first quarter of 2020, as the breaking point of a new segment in the analysis of the relationship between the variables. The observed TPD is significant at 1 percent before COVID and 5 percent post-COVID. EXGS has the opposite profile: significant at 5 percent before COVID and 1 percent post-COVID. CPI and ΔGDP are significant at 1 percent before and after the COVID outbreak, the first variable having negative coefficients. These results suggest that total debt, exports of goods and services, inflation and growth of GDP have a sustained effect on household debt during the whole period under study, and the COVID pandemic did not change the variables influence over households expending. The exception is total taxes revenue, TTR, that has lost significance on the period post-COVID.

When the differences between the segments before and post-COVID are examined the analysis revels that only total public debt (TPD) has shown a relevant difference between the coefficients of the regressions: this difference is both statistically significant, at 5 percent, and negative. In a segmented regression the model is divided into separated segments, each with its own slope. A negative difference in slopes between two segments means that the slope of the second segment is less than the slope of the first segment (Hansen 2017). This suggests a reduction in the rate of change of individuals consumption after the COVID outbreak, disclosing that the relationship between government debt and the household spending weakened in the period post-COVID.

Table 3

Segmented Regression

Variables	(A) Before COVID	(B) Post-COVID	Difference (B-A)
TPD	.466	.218	-0.217
	0.000***	0.029**	.016**
EXGS	.321	.386	0.065
	0.013**	0.006***	.333
CPI	-.0046	-.0055	0.0009
	0.000***	0.005***	.904
TTR	.163	-.023	0.186
	0.034**	0.361	.112
ΔGDP	.612	.574	-0.037
	0.000***	0.000***	.908
Observations:	20	19	
F-value:	217.97	8.70	
F (sig.):	0.000	0.009	
R-squared:	0.9626	0.7178	
Breusch-Godfrey:	0.6977	0.2363	

Dependent Variable: Household Consumption Expenditure (HCE)

*,**,*** denote significance at 10%, 5% and 1% respectively

This result does not imply that government spending ceased to be relevant in the support of households' consumption, but reveals that its effects are weakening comparatively to before the COVID-19 outbreak.

According to Tangkanjanapas et al. (2020) there is a non-linear relationship between public debt and economic growth in Thailand. Specifically, there is a threshold level of 48 percent of public debt to GDP, beyond which additional debt negatively impacts economic growth. Similar results were found by Chaisaard (2021), and Uprasen (2022), with decline in public dept impact on consumption occurring after 50 and 60 percent of GDP, respectively. Following this reasoning, the slow-down in the rate of change between TPD and HCE may indicate that public debt is close to or have exceeded the point where it has a positive impact on household consumption. However, further research is necessary to confirm this observation, which is beyond of the scope of this study.

Result

Both Thailand's government debt and household consumption have been the topic of significant discussion, particularly in the period following the COVID-19 pandemic, when the government had to carry out the necessary initiatives to face the crisis and to bolster recovery afterwards, leading to an increase in debt-to-GPD ratio that recently moved to 64 percent and is forecasted to reach 69 percent by 2029, only one percentage point below the ceiling of 70 percent.

In this regard, this study aims to verify if government spending had a positive effect on household consumption both before and after the COVID outbreak, as a means to evaluate both the accuracy of the consumption supporting programs and to guide future initiatives. In order to achieve these goals this study set up two main objectives: (1) determine the impact of government debt on household consumption in Thailand and (2) determine the influence of the COVID-19 pandemic, including the period post outbreak, on the dynamic between government debt and household consumption. These objectives were achieved by examining the relationship between household consumption, government debt, COVID-19 impact and a group of macroeconomic control variables, including gross fixed capital formation, foreign direct investment, exports of goods and services, consumer price index, total tax revenue and gross domestic product growth. The study focused on the period between 2005 to 2024, divided in two parts: before COVID (2005 to 2019) and post-COVID (2020 to 2024). The quantitative analysis employed a Generalized Least Squares (GLS) random-effect regression, an Autoregressive Distributed Lag (ARDL) approach to assess both immediate and lagged effects, and a Segmented Regression to investigate the before and after effects of the COVID-19 outbreak.

Both foreign direct investment (FDI) and gross fixed capital formation (GFCF) did not significantly impact household consumption. Nevertheless, total public debt (TPD) has a positive and significant impact on household consumption, confirming the assumption that government spending stimulates household consumption. The ARDL outcome displayed a lag between two to four quarters, a result that suggests a short delay but a sustained impact of government debt on household consumption. The segmented regression analysis shows a weakened relationship between public debt and household consumption in the period post-COVID, with a negative and significant difference in the rate of change between segments. This result implies that while public debt still relevant, its effectiveness in stimulating consumption has decreased, potentially due to Thailand's public debt approaching a threshold where its positive effects on growth will decline, supporting findings from Tangkanjanapas (2020), Chaisaard (2021), and Uprasen (2022).

Total tax revenue (TTR) also positively impacts consumption, as taxes generate the income to fund public investments that indirectly supports household's spending. However, the segmented regression shows that TTR lost significance in the post-COVID period, indicating a shift in its role after the pandemic. Exports of goods and services (EXGS) and GDP growth (ΔGDP) both have positive and significant effects on household consumption, though their impacts differ in timing. EXGS influences consumption with a lag of three to four quarters, reflecting the time it takes for export income to reach households, while ΔGDP shows a more immediate effect, with significant impacts within two to three quarters. For both, the impact on household consumption is relativly stable before and after COVID. Inflation (CPI), on the other hand, has a negative and significant effect on consumption on the first and second quarters, as rising prices reduce households' purchasing power in the short-term. This variable also has a steady impact in the periods before and post-COVID.

In summary, the study's findings directly address its two key objectives. First, regarding the impact of government debt on household consumption, government spending has a positive impact on household consumption, with a slightly delayed but steady effect. Second, regarding the second objective—analyzing COVID-19's influence on this relationship—the effectiveness of public debt support to household spending decreased with debt levels expansion in the period post-COVID, revealing a weakened effect post-pandemic, as Thailand's rising debt-to-GDP ratio (approaching 70%) diminishes the consumption-stimulating power of government spending. This aligns with prior research suggesting debt thresholds beyond which fiscal expansion loses efficacy.

In this regard, policymakers should incorporate this knowledge on lagged effects and public debt thresholds when designing fiscal policies in order to promote sustainable economic growth and stability.

Recommendations

The results discussed above show a relevant impact of public debt on household spending, with implications regarding research focusing on fiscal policies during times of crisis, when government stimulus would be necessary as a means to support consumption and foster economic recovery, but could bring about an excessive debt that could also slowdown that recovery. In this regard, there is more that can be investigated on the subject matter, but it was outside of the scope of this present study. Two suggestions for future research are included below as a way to promote further discussion on this topic.

First, future studies could investigate in more detail the impact of public debt threshold on household consumption, in special in the context of Thailand's distinct economic profile and history. Further research could focus on the peculiarities of household's demand, including the effect of public debt on consumption of durable and non-durable goods, different levels of household's income, demographic factors like size, age and education, regional differences, employment conditions, and on any other relevant factor. This would give policymakers the opportunity to fine tune fiscal policies in order to achieve the most positive effect without hindering growth and development or causing economic instability.

Second, more discussion is necessary concerning the delayed impact between policy implementation and consumption growth. As discussed in the previous section, government policies changes may take time to achieve their objectives, potentially creating more instability before they can be effective. This topic is particularly important in emergency situations, such as the recent COVID-19 pandemic, when households' income was abruptly reduced, with negative repercussions to the overall economy. In order to better understand the timing and delay in fiscal policies, future studies could focus in the specific characteristics of different initiatives. Those studies could include for example the timing and delay of direct government cash transfers, reduced sales and income taxes, increased government spending in specific projects, including infrastructure, social programs, or subsidies. These studies would provide policymakers with specific targets to address during the crises, avoiding broad-based stimulus that could unnecessarily increase government

debt.

Additionally, these research projects could include comparative analyses to other countries in ASEAN, in order to understand the characteristic of Thailand's unique conditions.

By addressing these research gaps, future studies could improve the general knowledge on the interactions between fiscal policies, public debt, household consumption, and crises economic responses, this way policymaker to the better design suitable policies that encourage both economic stability and growth. In this regard, policymakers' priority should be on targeted fiscal stimulus that improve consumption of low-income households, which have higher propensity to consume, therefore maximizing the impact of such policies. However, giving the diminishing returns of debt-based policies, Thailand could redirect the focus to productive investments in infrastructure and education, which would result in a more sustainable growth while avoiding excessive debt accumulation.

References

Agarwal, S., Koo, K. M., & Qian, W. (2022). Consumption response to temporary price shock: Evidence from Singapore's annual sale event. *Journal of financial intermediation, 51,* 100966.

Alesina, A., Favero, C., & Giavazzi, F. (2019). Effects of austerity: Expenditure-and tax-based approaches. *Journal of economic perspectives, 33*(2), 141-162.

Alvaredo, F., Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2017). Global inequality dynamics: New findings from WID world. *American economic review, 107*(5), 404-409.

Attanasio, O. P., & Pistaferri, L. (2016). Consumption inequality. *Journal of economic perspectives, 30*(2), 3-28.

Auerbach, A. J., & Gorodnichenko, Y. (2017). *Fiscal stimulus and fiscal sustainability (No. w23789)*. National Bureau of Economic Research.

Baker, S., Farrokhnia, R. A., Meyer, S., Pagel, M., & Yannelis, C. (2023). Income, liquidity, and the consumption response to the 2020 economic stimulus payments. *Review of finance, 27*(6), 2271-2304.

Bato, M. J., & Viray Jr, E. (2024). Exploring the effects of high national debt on household consumption and foreign direct investments. *Bedan research journal, 9*(1), 112-144.

Blanchard, O. (2019). Public debt and low interest rates. *American economic review, 109*(4), 1197-1229.

Canakci, M. (2021). The impact of monetary policy on household debt in China. *The journal of asian finance, economics and business, 8*(4), 653-663.

Carvalho, C., Ferrero, A., & Nechio, F. (2016). Demographics and Real Interest Rates: Inspecting the Mechanism. *European economic review, 88*, 208–226.

Carvalho, V. M., Garcia, J. R., Hansen, S., Ortiz, A., Rodrigo, T., Rodriguez Mora, J. V., & Ruiz, P. (2021). Tracking the Covid-19 Crisis with high resolution transaction data. *Royal society open science, 8*(8), 210–218

Chaisaard, K., (2021). *Chulalongkorn University Theses and Dissertations (Chula ETD). 7660. The impact of public debt on economic growth: evidence from Thailand.* Retrieved from https://digital.car.chula.ac.th/chulaetd/7660

Coibion, O., Gorodnichenko, Y., & Weber, M. (2022). Monetary policy communications and their effects on household inflation expectations. *Journal of political economy, 130*(6), 1537-1584.

Dieppe, A. M., Guénette, J. D., Ha, J., Kindberg-Hanlon, G., Kirby, P. A., Nagle, P. S. O., & Ye, L. S. (2020). *Global economic prospects: Slow growth, policy challenges*. World Bank Group Working Paper.

Égert, B. (2015). Public debt, economic growth and nonlinear effects: Myth or reality?. *Journal of macroeconomics, 43,* 226-238.

Fagereng, A., Holm, M. B., & Natvik, G. J. (2021). MPC heterogeneity and household balance sheets. *American economic journal: Macroeconomics, 13*(4), 1-54.

Fatás, A., & Summers, L. H. (2018). The permanent effects of fiscal consolidations. *Journal of international economics, 112,* 238-250.

Gabriele, A. (2006). Exports of services, exports of goods, and economic growth in developing countries. *Journal of economic integration*, 294-317.

Government Public Relations Department (PRD). (2024). *Thailand's public debt remains below the ceiling.* Retrieved from https://thailand.prd.go.th/en/content/category/detail/id/48/iid/337798.

Guren, A., Mc Kay, A., Nakamura, E., & Steinsson, J. (2018). *General equilibrium multipliers of housing wealth effects and fiscal shocks. (No. w24729).* National Bureau of Economic Research.

Hagedorn, M., Manovskii, I., & Mitman, K. (2019). *The fiscal multiplier (No. w25571).* National Bureau of Economic Research.

Hansen, B. E. (2017). Regression kink with an unknown threshold. *Journal of business & economic statistics, 35*(2), 228-240.

Kaplan, G., & Violante, G. L. (2014). A model of the consumption response to fiscal stimulus payments. *Econometrica, 82*(4), 1199-1239.

Kee, H. L., & Tang, H. (2016). Domestic value added in exports: Theory and firm evidence from China. *American economic review, 106*(6), 1402-1436.

Mian, A., Sufi, A., & Verner, E. (2017). Household debt and business cycles worldwide. *The quarterly journal of economics, 132*(4), 1755-1817.

Miyajima, K. (2024). Monetary policy, inflation and distributional impact: South Africa's case. *South African journal of economics, 92*(3), 305-330.

Morina, F., Misiri, V., & Alijaj, S. (2024). Examining the relationship between public debt and private consumption in European OECD countries (2011–2020). *Quantitative finance and economics, 8*(1), 75-102.

Nation Thailand. (2025). *NESDC rings alarm bell as Thailand's public debt approaches 70% of GDP.* Retrieved from https://www.nationthailand.com/business/economy/40045054?utm_source=chatgpt.com

Phillips, P. C., & Shi, S. (2019). Detecting financial collapse and ballooning sovereign risk. *Oxford bulletin of economics and statistics, 81*(6), 1336-1361.

Ramey, V. A. (2019). Ten years after the financial crisis: What have we learned from the renaissance in fiscal research?. *Journal of economic perspectives, 33*(2), 89-114.

Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a time of debt. *American economic review, 100*(2), 573-578.

Tan, C. T., Mohamed, A., Habibullah, M. S., & Chin, L. (2020). The impacts of monetary and fiscal policies on economic growth in Malaysia, Singapore and Thailand. *South Asian journal of macroeconomics and public finance, 9*(1), 114-130.

Tangkanjanapas, T. A., & Dheera, A. (2020). Public debt and economic growth: The empircal result of Thailand. *RMUTT global business and economics review, 15*(2), 1-18.

Tuna, E., Evren, A. A., Şahinbaşoğlu, Z. Z., & Veznikli, M. (2023). Examination of the effects of covid-19 on happiness in different geographical regions with piecewise linear panel data models. *Sustainability, 15*(11), 8569.

Uprasen, U. (2022). *The macroeconomic impact of government debt: an empirical analysis of Thailand in sustainable development in asia: Socio-economic, financial, and economic perspectives.* Cham: Springer International Publishing.