

Research Article

The Impact of Macroeconomic Indicators and External Shocks on Government Debt Dynamics in Selected ASEAN Countries

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Abstract: In many developing economies, the government's borrowing is a preferred alternative to other forms of financing, especially when governments require large sums to fund infrastructure and social programs. This reliance on debt financing, however, can lead to rising public debt levels, particularly if corresponding improvements do not match the borrowing in terms of economic productivity or revenue generation. Over time, this may pose challenges to fiscal sustainability, increase debt servicing burdens, and reduce the government's ability to respond flexibly to future economic shocks. Therefore, this study examines the impact of macroeconomic indicators and determinants of government debt in selected ASEAN countries. Using panel data from eight (8) ASEAN countries for 20 years, this paper employs the Random Effects Model (REM) to assess the relationship between these variables and government debt. The findings reveal that GDP growth has a significant impact on reducing debt levels. At the same time, FDI reveals a significantly positive relationship which increases debt. Government expenditure and lagged Government Debt exhibit a statistically positive relationship with Government Debt. Nonetheless, neither inflation nor crisis episodes has a statistically significant impact on debt. The results suggest that economic growth and tailored fiscal strategies are key to maintaining sustainable debt levels.

Keywords: Government Debt, Macroeconomic Indicators, External Shocks, COVID-19, Panel Data

INTRODUCTION

Government debt represents borrowing undertaken by governments to finance national development and address fiscal deficits. In many developing economies, borrowing is a preferred alternative to other forms of financings, especially when governments require large sums to fund infrastructure and social programs. Nur Hayati (2012) stated that public debt arises when existing government revenues fall short of expenditure requirements. This occurs because the government is involved in a wide range of activities. However, the financing especially through tax revenue is often insufficient to fully finance these activities. It resulted in a fiscal deficit, a condition where government spending exceeds its revenue. To bridge this gap, governments

typically resort to borrowing to fulfill their essential responsibilities. Therefore, most of the efforts to finance government activities are through borrowing.

Siti Khalijah (2016) highlighted that borrowing, if directed toward productive investments, has the potential to stimulate economic growth. Under the macroeconomic theory, borrowing for expenditures such as education, healthcare, and infrastructure can yield long term benefits and stimulate productivity. However, unchecked borrowing can generate risks, including rising interest obligations, crowding out private investment, and burdening future generations (Shaliza et al., 2022).

In recent decades, government debt has emerged as a critical issue in both advanced and developing economies, with growing concern over its sustainability and long-term economic implications. IMF (2023) data show that the ratio of public debt to GDP grew from 105.4% in 2019 to 124.4% in 2020 in advanced countries, from 55.7% to 65.8% in emerging economies and from 42.9% to 48.5% in developing countries. Within the ASEAN region, several member countries have experienced rising public debt levels, driven by increased government spending to support economic development, infrastructure expansion, and social protection (Table 1).

Table 1: Government Debt in ASEAN 2022

Rank in ASEAN	Country	Government Debt (2022)
1	Singapore	158.25
2	Laos	60.93
3	Philippines	60.92
4	Malaysia	60.30
5	Indonesia	40.14
6	Vietnam	37.14
7	Cambodia	25.04
8	Brunei	2.06

Source: The Global Economy (2023)

In ASEAN countries, government debt levels vary considerably. Some nations, such as Singapore, exhibit high debt-to-GDP ratios. This is largely driven by borrowing for investment purposes, while Malaysia maintains relatively stable and moderate debt levels. The region as a whole witnessed a significant rise in public debt during the COVID-19 pandemic, however, recent trends indicate a moderation in debt levels in several countries.

Borrowing can serve as an effective fiscal tool, however, excessive dependence on debt particularly in the absence of strong economic fundamentals, can undermine

macroeconomic stability. A substantial increase in public debt to finance infrastructure-related fiscal stimulus, if not well managed, may ultimately harm the economy. Moreover, external shocks such as the COVID-19 pandemic can exacerbate these vulnerabilities. In light of this, the present study aims to examine the impact of macroeconomic indicators and external shocks on government debt in ASEAN countries.

LITERATURE REVIEW

Previous studies have examined various relationships between public debt and macroeconomic indicators such as economic growth and government expenditure. Ibrahim (2023) studied the case of Ghana revealed a positive relationship between economic growth, government expenditure and public debt. This study employs the ARDL analysis. In the case of India, Dhir (2017) observed that internal dynamics primarily drive GDP growth, while government expenditure shows a positive relationship with debt levels. Swamy (2015) and Le Thanh (2020) showed that GDP growth has a negative relationship with public debt, supporting the debt reducing role of economic expansion. Meanwhile, the study by Mohamad Helmi et al. (2025) using panel ARDL analysis on ASEAN-5 countries finds that government debt has a positive long-run impact only in Singapore, while the remaining countries exhibit a negative long-run effect. In Malaysia, several studies (Bettina & Alfred, 2014; Shahril et al., 2021; Foo et al., 2020) using different panel data techniques have consistently reported a positive relationship among debt, GDP, investment, and government expenditure.

The relationship between inflation and government debt has been examined by Omrane (2017) and Jibir and Aluthge (2019), using different econometric models in Tunisia and Nigeria respectively. Omrane (2017) using ARDL method found a negative relationship between inflation and government debt. Contrary, Nastansky and Strohe (2015) found a significant positive relationship between debt and inflation in Germany, with inflation expectations being a key channel. Aimola and Odhiambo (2020) similarly reported a positive relationship between debt and inflation in emerging markets, particularly where financial systems are underdeveloped.

The role of FDI in influencing debt remains a subject of debate. There is ambiguous finding for example Kiprotich (2015) identified a positive relationship between FDI and domestic debt, while Swamy (2015) found that FDI may reduce public debt levels. This inconsistency suggests the relationship may be context-dependent and moderated by institutional factors.

There are many definitions of external shock (Doern et al, 2019). Basically, external shocks of COVID-19 refer to the unanticipated, severe, and globally transmitted economic disruptions caused by the COVID-19 pandemic that originated outside the control of individual countries but had significant domestic economic and fiscal consequences. Several studies have investigated the impact of COVID-19 on Government Debt. Among others, Klutse, Sugi and Kiss (2023) found that COVID-19 significantly affected the debt levels of Ghana and Kenya. This study argues that, rather than depending on widely recommended debt relief measures, countries should focus on building domestic fiscal buffers and expanding fiscal space as a more sustainable path

toward long-term debt sustainability. While Srivastava et al (2020) revealed a positive relationship between COVID-19 external shocks and public debt in G20 countries.

METHOD

This study investigates government debt in 8 (eight) ASEAN countries for 20 years. The study adapts the models used by Swamy (2015a), Ibrahim (2023), and Sahoor et al. (2022) to estimate the determinants of debt;

$$GD_{it} = \alpha_0 + \beta_1 FDI_{it} + \beta_2 INF_{it} + \beta_3 GE_{it} + \beta_4 GDP_{it} + \beta_5 ES_{it} + \beta_6 DEBT_{it}(-1) + \varepsilon \quad (1)$$

Where:

- GD = Government Debt
- FDI = Foreign Direct Investment
- INF = Inflation
- GE = Government Expenditure
- GDP = Gross Domestic Product Growth
- ES = External shock Dummy (1 = COVID-19 year, 0 = otherwise)
- DEBT(-1) = Lagged Government Debt
- ε = Error term
- i = Country
- t = Time period

Three models of panel static are tested to obtain the final result. These include the Pooled Ordinary Least Square Model (POLS), the Random Effect Model (REM) and the Fixed Effect Model (FEM). The equation of Pooled Ordinary Least Square is shown as;

$$Y_{i,t} = \alpha + \beta_1 X_{i,t} + \varepsilon_{i,t} \quad (2)$$

While, the Random Effect Model take the equation of;

$$Y_{i,t} = \alpha + \beta_1 X_{i,t} + (\varepsilon_{i,t} + \mu_{i,t}) \quad (3)$$

When testing to determine whether to choose Pooled Ordinary Least Square Model or Random Effect Model the Breusch Pagan Lagrangian multiplier test has been applied. The hypothesis is been set as follows;

H0: Choose Pooled Ordinary Least Square Model

H1: Choose Random Effect model

If the probability of Chi2 is less than 0.05, therefore the H0 is been rejected and the random effect model is used.

The study can be further developed using the Fixed Effect Model as follow;

$$Y_{i,t} = \alpha_i + \beta_1 X_{i,t} + \varepsilon_{i,t} \quad (4)$$

If the analysis is proceeded to decide the model of Random Effect Model or Fixed Effect Model another test of Hausman Fixed Test is applied. The hypothesis of Hausman Fixed Test is;

H0: Choose Random Effect Model

H1: Choose Fixed Effect Model

In determining to choose the Fixed Effect Model the Hausman Fixed Test, the Chi2 should be less than 0.05. This indicates that H1 is accepted and the analysis can proceed to Fixed Effect Model.

RESULTS AND DISCUSSION

The result of the correlation between the variables is presented in Table 1. The value of correlation ranges between -1.0 and +1.0 in order to determine the degree of association between two variables. Based on the result, it shows that FDI and government expenditure (GE) have a positive correlation with the Government Debt (GD). Variables that have a positive correlation indicate that the degree of movement of the variable is parallel. If one variable increases, the other variable increases and vice versa. FDI shows a negative correlation with GE ($r=-0.52$), suggesting that countries with higher government spending may attract less FDI. The inflation (INF) and GDP show a negative correlation to GD. This indicates that when two variables are negatively correlated, it indicates that if one variable increases, the other variable decreases and vice versa. Meanwhile, GDP has a positive correlation with FDI, but a negative correlation with INF and GE. The study omits the dummy variable of external shocks, COVID-19 and the lag of GD in the test of correlation.

Correlation	GD	FDI	INF	GE	GDP
GD	1.0000				
FDI	0.2628	1.0000			
INF	-0.0563	-0.0541	1.0000		
GE	0.1042	-0.5177	-0.0972	1.0000	
GDP	-0.1539	0.0135	-0.1249	-0.0257	1.0000

Table 2: Correlation of Coefficient Analysis.

Furthermore, correlation analysis was employed to assess the potential presence of multicollinearity among the independent variables. The findings reveal that most correlation coefficients are relatively weak, indicating a minimal risk of multicollinearity. Specifically, no pairwise correlation exceeds the threshold of 0.8, suggesting that multicollinearity is not a significant concern in this study.

After the series of tests in determining which model should be used, the Breusch Pagan Lagrangian multiplier test has shown the p-value of χ^2 is significant. The value of χ^2 is 0.0016 which is lower than 0.05 which shows the null hypothesis can be rejected. Thus, the Random Effect Model instead of the Pooled Ordinary Least Square Model will be used. Nonetheless, this study is unable to proceed with the Fixed Effect Model as the Hausman Fixed Test shows an insignificant p-value of χ^2 . The null hypothesis of choosing the Random Effect Model is accepted. Therefore, panel data analysis of the Random Effect Model is applied to be the final analysis.

Table 2 presents the results from the Random Effects Model (REM) estimation. The model reports an R-squared value of 0.5724, indicating that approximately 57.24% of the variation in government debt is explained by the included explanatory variables. The overall model is statistically significant at the 1% level, as indicated by the F-statistic probability of 0.000, suggesting that the selected macroeconomic variables jointly have a significant effect on government debt.

Table 3: Random Effect Model

R Squared 0.5724		F stat (prob) = 0.000	
Variables	Coefficient	T statistics	P-Value
C	0.114741	0.2876	0.7738
GDP	-0.100515	-3.5772	0.0004
FDI	0.291427	3.5929	0.0004
INF	0.000197	-0.4033	0.6870
GE	0.009029	2.0857	0.0379
GD(-1)	0.952431	101.4363	0.0000
ES	0.015570	0.0520	0.9585

GDP shows the coefficient of -0.1005, and it is statistically significant at the 1% level (p-value = 0.0004). The negative sign of the coefficient suggests that an increase in GDP is associated with a decrease in government debt, holding other variables constant. This result is consistent with the theoretical expectation that economic growth improves fiscal health. As the economy expands, government revenues generally increase through higher tax collection and reduced need for fiscal intervention, thereby lessening reliance on borrowing. The significant t-statistic (-3.5772) further reinforces the robustness of this relationship. This finding aligns with existing literature, Swamy (2015), Le Thanh (2020), Bettina and Alfred (2014), Shahril et al. (2021) and Foo et al. (2020), which emphasizes the role of strong economic performance in enhancing debt sustainability. For instance, these studies have shown that countries with higher GDP growth tend to experience lower debt accumulation over time, as growth driven revenues reduce budget deficits and borrowing needs.

Contrary to GDP, foreign direct investment (FDI) is positively and significantly associated with government debt, with a coefficient of 0.2914 and a p-value of 0.0004. The finding may appear counterintuitive, as FDI is generally perceived as a source of external financing that supports economic growth and reduces the need for government borrowing. However, the finding is similar to Kiprotich (2015), which suggests that higher FDI inflows are associated with increased public debt, potentially reflecting increased government commitments to infrastructure, investment incentives, or co-financing arrangements.

The coefficient for government expenditure (GE) is 0.0090, with a t-statistic of 2.0857 and a p-value of 0.0379, indicating that the variable is statistically significant at the 5% level. This finding is in parallel to Dir (2017) and Ibrahim (2025). The positive relationship indicates that increased public spending contributes positively to the accumulation of government debt. The finding is theoretically plausible and reflects the typical fiscal dynamics in many developing and emerging economies, where increased public spending if not matched by equivalent increases in revenue, tends to widen fiscal deficits and lead to higher levels of borrowing. The finding also supports the Keynesian view that expansionary fiscal policies, characterized by higher government spending, can lead to short term economic stimulus but may also result in higher debt accumulation if not accompanied by adequate revenue mobilization. In the context of ASEAN countries, this may reflect efforts by governments to support economic growth through public investments in infrastructure, health, and education, especially during or after external shocks such as the COVID-19 pandemic.

The coefficient on the lagged government debt variable (GD(-1)) is highly significant ($p < 0.0001$) demonstrating a strong degree of persistence in government debt over time. This highlights the path dependent nature of fiscal dynamics, where current debt levels are heavily influenced by past debt accumulation. Nonetheless, the magnitude of the coefficient is relatively small, suggesting that while GE contributes to rising debt levels, the impact is more modest compared to FDI. This could imply that the composition and efficiency of government spending play a critical role. Productive and well targeted public investment could have a different long term impact on debt sustainability than inefficient or consumption based spending.

In contrast, inflation (INF) and external shocks (ES) do not exhibit statistically significant effects on government debt, with p-values of 0.6870 and 0.9585, respectively. This suggests that, within the context of this model and the sample period, inflationary pressures and external shocks do not exert a direct and immediate impact on debt levels. The constant term is also statistically insignificant, implying no meaningful interpretation when explanatory variables are held at zero. For external shocks of COVID-19, this is in contrast with the popular belief that COVID-19 will have a big impact on government debt. Nonetheless, the short period of observation of COVID-19, may affect the whole result.

CONCLUSION

This study examined the impact of several key macroeconomic determinants and external shocks on public debt in selected ASEAN countries. The result reveals that debt accumulation is heavily influenced by its past values. This is a sign of structural fiscal inertia. GDP growth emerges as a critical factor in reducing debt, emphasizing the need for policies that stimulate sustainable economic expansion. The influence of FDI and government expenditure, suggests the importance of domestic policy environments and institutional quality. The lack of significance for inflation and crisis variables may be due to either policy interventions that buffer these effects or time lags not captured in the model. While public debt is a vital tool for development, its sustainability hinges on strategic allocation, economic performance, and prudent fiscal governance. Policymakers must manage debt accumulation carefully, ensuring that borrowing is targeted at productive investments that yield long term returns.

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