GOVERNMENT DEBT AND ECONOMIC IMPACT: AN ANALYTICAL COMPARISON OF DIFFERENT COUNTRIES

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OPEN ACCESS

How to cite this paper: Siying, W. (2024). Government debt and economic impact: An analytical comparison of different countries. *Risk Governance and Control: Financial Markets & Institutions, 14*(1), 122–137.
https://doi.org/10.22495/rgcv14i1p9

ISSN Online: 2077-4303
ISSN Print: 2077-429X

Received: 20.10.2023
Accepted: 25.03.2024

JEL Classification: E62, F4, F5
DOI: 10.22495/rgcv14i1p9

Abstract

The increase in the level of government debt has led to economic instability in a number of developing as well as developed nations. According to a study by Hilton (2021), having an unsustainable amount of public debt can slow down the economic growth of the nation in the long run. Therefore, it has become increasingly important to understand the economic impact that government debts have on different countries. The countries used in this paper are Brazil, Malaysia, South Africa, Thailand, and Turkey. Firstly, the study analyses the trends of public debt across these five countries. From the analysis, it could be realised that the level of government debt increased across all the countries. Moreover, the study also used a vector error correction model (VECM) methodology along with an impulse response function (IRF) to account for the country-wise impact of public debt on economic growth. The results showed that there is a negative impact on the economic growth of Brazil, Malaysia, Thailand, Turkey, and South Africa. Furthermore, the study also accounts for the impact of fiscal policies on the debt management structure of the specified countries.

Keywords: Public Debt, Economic Growth, VECM, Fiscal Policies, Debt Management

Authors' individual contribution: The Author is responsible for all the contributions to the paper according to CRediT (Contributor Roles Taxonomy) standards.

Declaration of conflicting interests: The Author declares that there is no conflict of interest.

1. INTRODUCTION

Government debt has become a topic of growing concern around the world over the past few decades. A study by United Nations Conference on Trade and Development (UNCTAD, n.d.) has revealed that developed economies accumulate approximately 70 per cent of global debt, whereas emerging economies hold only 30 per cent. This shows that there is an uneven distribution of debt across developing and developed economies. Such a skewed distribution of debt often leads to disbalances regarding the economic growth and development of these countries. As a result, most of the countries globally have a unique public debt management system that suits their economic environment. However, the information regarding the impact that a high public debt has on countries is limited in nature. According to a study by Rahman et al. (2019), low-income countries as well as upper middle-income countries have very limited data regarding the impact that government debt has on the various economic indicators. This is because of the lack of study resources and data collection in such economies. As a result, this research embarks on a comprehensive journey to analyse and compare government debt trends, economic effects, and fiscal policies across five diverse economies.

The level of public debt of a country provides a significant indication of the economic stability of a country. According to a study by Hilton (2021), having a stable amount of public debt with respect to the economic conditions of the country allows a long-term impact on gross domestic product (GDP) growth. This further ensures that the economic health of the country is balanced which would also provide the countries with an opportunity to become more sustainable. Therefore, this shows that it is extremely important for countries to stabilise their government debt. As a result, this study aims to contribute to the existing literature by conducting a comparative analysis of government debt and its economic impact in five countries.

The research objectives of this paper are threefold: firstly, to identify patterns, trends, and changes in government debt; secondly, to assess the economic effects; and finally, to compare fiscal policies and debt management strategies.

The research questions corresponding to the objectives are the following three:

RQ1: How has the public debt pattern evolved for these countries over time?

RQ2: What are the economic impacts of government debt on other economic indicators such as GDP, inflation rate and consumption expenditure?

RQ3: What is the impact of fiscal policy on public debt management?

This particular study utilises a novel approach in order to determine the impact of government debts on economic indicators across five upper-middle-income economies. The existing literature has provided valuable dynamics regarding the trend and dynamics that government debt has on the economic growth of countries. However, there are significant gaps with respect to the various factors that impact the economic growth of countries. Moreover, there is also a significant gap in providing cross-country analysis of the same. As a result, by addressing these research gaps, this study provides a more diverse insight into the impact that government debt has on the economic indicators of global economies. Furthermore, the study also contributes significantly to the ongoing discussions of the sustainability of having a high level of government debt. The economic sustainability issues that the global economies have faced recently during the negative shocks of the COVID-19 pandemic have been a major motivation behind the research. Moreover, addressing this problem also allows the research to cater to a global audience who face the same uncertainty regarding the rising government debt on the long-term impact of economic growth in upper-middle-income economies.

This particular paper has been divided into six sections. Section 1 introduces the research problem as well as research questions, whereas Section 2 shows the various evidence found from previous literature. Section 3 of the study provides the empirical methodology that the research follows. Section 4 proposes the results obtained from the data analysis and the same is further discussed in Section 5. Finally, Section 6 concludes the research and paves the way for future research.

2. LITERATURE REVIEW

This section of the research analyses the previous pieces of literature on the impact of government debt on the different economic indicators of a country.

2.1. Trends of government debt

The global world has shown a rising trend in government debts over the past few decades. According to a study by Cantú et al. (2020), a majority of the emerging market economies have reached a level of government debt which is approximately 70 per cent of their GDP. The primary reason behind this rising trend in government debt is fiscal expenditure. As global economies are adhering to expand their economic growth, they are also looking to external borrowing, which is eventually increasing their government debt. For instance, it could be observed that the Brazilian economy has a debt-to-GDP ratio of 90 per cent in 2021 (Rogoff, 2022). This is because Brazil failed to generate adequate revenue in order to accelerate its economic growth. As a result, the country had to adhere to external forms of borrowing which led to a rise in the government debt trend of the country.

The Malaysian economy also faced a significant spurt in government debts over the years. A study by Burhanudin et al. (2017) has revealed that the debt-to-GDP ratio in Malaysia reached 101.7 per cent in 1987 due to the Asian Financial Crisis. Although, at present the trend has reduced significantly to 53.8 per cent by 2015. This comes as a result of the Malaysian government stabilising its economy and GDP over time. Moreover, this trend is supported by the high government expenditures undertaken by the Malaysian government over the years. In South Africa, the public debt has shown a decreasing trend between 1991 and 2008. This came as a result of the sound and prudent fiscal measures that had been implemented by the Government of South Africa (Ramcharan, 2009). Although, in the following years the debt-to-GDP ratio increased exponentially in South Africa. This came as a result of economic stagnation as well as the bureaucracy and inefficient fiscal policies that were implemented in the economy (Sachs, 2021). Moreover, the high-interest rate and debt service cost made the situation worse in the South African economy. Overall, the debt in South Africa is often termed unstainable in nature because of the economic health of the country.

The economy of Thailand like most other economies also showed an increasing trend of government debt. In Thailand, the GDP to debt ratio crossed the 90 per cent threshold in recent times (Lau et al., 2022). This trend in Thailand was propelled by the current trend of government expenditures in order to boost economic growth. Moreover, external shocks like the COVID-19 pandemic have also led to a high requirement for external funding (Cantú et al., 2020). This justifies the reason behind the growing government debt trend in Thailand. The Turkish economy also showed similar trends through a rising debt-to-GDP ratio. The Turkish economy faced phases of

stagnant or low economic growth which led to an unsustainable level of borrowing (Eğrican et al., 2022). Moreover, the same study also reports that Turkey required significant debt restructuring as the real interest rates surpassed the real growth rate. This justifies the increasing trend of government debt in Turkey.

2.2. Impact of government debt on the economy

Government debts have a varied effect across upper-middle-income economies. As concluded by Brady and Magazzino (2018), government debts have unfavourable impacts on economic indicators such as inflation, unemployment and consumption expenditure. A study by Gómez-Puig et al. (2022) conducted across 115 countries between 1995–2016 has concluded that public debt has a negative impact on economic growth. The magnitude of the negative impact ranges between -0.027 per cent and -0.006 per cent. Another study by Ma and Qamruzzaman (2022) also states that there is a -0.054546 percentage point in Brazil specifically. This is because the government debt causes economic uncertainty up to some extent in Brazil. With respect to Thailand, the level of government debt is often considered an instrument to propel economic performance. The study by Lau et al. (2022) reflects that the appropriate level of debt-to-GDP ratio can guide sustainable economic growth in Asian economies. This is because maintaining an optimal level of debt-to-GDP ratio allows the country to maintain investor confidence. Moreover, the same also allows the country to set a sustainable fiscal policy which would eventually allow economic growth. A similar set of results was also found in Malaysia where Chien et al. (2022) confirmed that an increase in public debt has a positive impact on fiscal spending. This is because developing economies like Malaysia need a substantial level of funding in order to boost their economic growth. As a result, these economies adhere to both internal funding as well as borrowings from other parties.

Despite having a positive impact on the Asian economies, the increasing government debt has also shown a negative correlation with certain economies. In Turkey, it has been observed that the economic growth fell by 0.8 per cent as the government debt increased by 1 per cent (Yildirim & Erdoğan, 2022). This is mainly because the Turkish economy was unable to absorb the high level of government debt. As a result, the economic growth of Turkey also slowed down. The same could also be observed in the South African economy as well. According to Makhoba et al. (2022), the economic growth of South Africa fell substantially in the long run. The study uses a smooth transition regression (STAR) to analyse the asymmetric relationship between public debt and economic growth across the Southern African Development Community (SDAC) economies. The inverted U-shape relation between both parameters shows that the borrowings by the government initially boost economic activities. However, when the borrowings reach an unsustainable level beyond economic growth, it has a negative impact on economic growth. This shows that economies that do not have a sustainable fiscal policy have a negative impact on the economic outcomes.

2.3. Comparison of fiscal policies and debt management strategies

From the previous pieces of literature, it has been observed that the economic policies as well as the debt management system have a significant impact on the economic outcomes across the five economies. South Asian economies like Malaysia and Thailand which have an effective debt management system seem to experience moderate economic growth because of public debt. However, other economies like Brazil, South Africa and Turkey which do not have a sustainable debt management system experience a negative impact on economic growth because of government debt. The Malaysian economy followed a trajectory of managing trade-offs and risks in order to maintain government debt sustainability. Malaysia posed a strong economic growth followed by a debt-to-GDP ratio of 60 to 65 per cent. Moreover, the Malaysian economy has also focused on a contractionary fiscal policy in order to reduce inflationary pressures. These fiscal policies combined with a stable debt-management system allowed Malaysia to have sustainable economic growth despite having a high government debt. Similar to Malaysia, Thailand has also acted within the bounds of government debt in order to facilitate sustainable economic growth. The Malaysian government imposed an accommodative monetary policy to maintain the high debts (International Monetary Fund, 2022). Moreover, Thailand restructured its debt in a manner where it could be managed because of the low bond yields. This made the government debt levels sustainable in both the South Asian economies.

The institutional value of the country also plays a pivotal role in the debt management strategy of a country. According to a study by Trampusch and Gross (2021), it could be understood that countries that have a stable institutional network have a better ability to absorb external debts. This allows the economy to maintain a sustainable level of debt-to-GDP ratio which would also foster economic growth. The same is further deduced in another study held in the euro area. According to the research by Zahariev et al. (2020), countries with better debt management systems foster economic growth up to 10 per cent. This is because having a stable debt-to-GDP ratio ensures consumer confidence. This in return helps the economy to grow and develop substantially. Moreover, the institutional capacity of a country also plays a pivotal role in setting the debt composition. According to a study by Delgado-Téllez and Pérez (2020), the fiscal policies set by the regional governments lead to an increase in the public debt. This study which is conducted in Spain takes into account the institutional dynamics of the nation. On the basis of the analysis, it could be further understood that the standard debt of the nation is impacted by the level of public commercial debt. This increase in the standard debt because of

the fiscal spending often exposes the economy to unnecessary risks. Therefore, it could be understood that institutional quality often determines the level of public debt as well as the structure of the same.

Through the various literature analysed previously, it has been understood that a study across upper-middle-income economies had not been done in order to gauge the impact of public debt on economic performance. This has also been highlighted as a significant area for future research by Rahman et al. (2019). Furthermore, there has not been any consolidated study that compared the impact of fiscal policies on debt management strategies. As a result, this study aimed to fill the gap by analysing the impact of government debt on economic performance across the five economies of Brazil, Malaysia, South Africa, Thailand and Turkey.

3. METHODOLOGY

3.1. Research strategy and design

This particular study which aims to find the impact of government debt on economic outcomes, will be quantitative in nature. Using a quantitative study also allows the research to facilitate a structured analysis of the impact of government debt on the economic performance of the selected countries (Ajayi & Edewusi, 2020). In order to conduct a quantitative study data would be sourced from various global data sources such as the World Bank and the International Monetary Fund. In order to conduct the research, the paper follows an onion model approach. Firstly, the study would involve a descriptive analysis which would analyse the trends and changes in government debt patterns across the five economies. This is the first broader layer that would observe an empirical phenomenon (Melnikovas, 2018). Based on the findings, the research would delve into a deeper layer which would provide a quantitative examination of the government debt on economic indicators.

A dynamic stochastic general equilibrium (DSGE) model is an alternative methodology this particular study can use. Using a DSGE model would allow the study to consider modern macroeconomic theories in order to predict the impact of government debt on the economic performance of the mentioned countries (Yang et al., 2020). Moreover, the consideration of such a methodology would also allow the study to provide a significant level of policy analysis to the broader audience. However, the study still sticks to a vector autoregressive (VAR) model as it allows to account for the shocks that government debt has on the economic performance of the economies. Moreover, the usage of the DSGE model would need detailed data which is not always available for all economies.

3.1.1. Evolution of public debts over time

The first research question concerns the trends and evolution of government debt over time. In order to address this research question, the study would adopt a methodology that entails a descriptive analysis. To show the historical trends of government on government debt levels for the specified countries, secondary data has been collected from authentic sources. The Global Debt Database has been used to show the central government debt of the five mentioned economies. The data is further shown as a percentage of the GDP of the particular country in a given time period. For the descriptive analysis, the study uses a time period between 1991 and 2022. Using these official statistics, the study would provide time-series graphs. These graphs would depict the changes in government debt levels over a specified time period. Furthermore, unique graphs would be visualised for the different countries involved in this study. Using such descriptive methodology with a graphical representation helps the study provide a comprehensive analysis of the evolution of public debt across Brazil, South Africa, Malaysia, Thailand, and Turkey.

H2: Public debts will exhibit significant changes over time across the selected economies.

3.1.2. Impact of public debt on economic performance

The second research question entails the impact of public debt on the economic performance of an economy. The study gauges these impacts across five countries Brazil, South Africa, Malaysia, Thailand, and Turkey. Moreover, the study entails a time-series approach which includes a VAR model and impulse response functions (IRFs).

In order to analyse the impact of public debt on economic outcomes, a number of economic indicators are considered. This includes GDP growth rate, change in unemployment rate, change in inflation rate and change in consumption expenditure. For this particular research question the data has been divided into dependent, independent and control variables. Furthermore, data has been collected from the World Bank as well as the International Monetary Fund databases. These are established database which provides substantial data for the analysis.

The variables used in this study are as follows:

- Dependent variable: *GDP growth rate* has been considered as the dependent variable in this study. This reflects the economic performance and growth trajectory of the nation.
- Independent variable: *Government debt* has been considered as the independent variable in this paper. This represents the level of indebtedness of the government to both domestic and external creditors.
- Control variables: *Inflation rate*, *Unemployment rate*, *Consumption expenditure as a percentage of GDP*.

The study uses a time-series analysis in order to realise the impact of government debt on the economic performance of an economy. This will be conducted across the five mentioned economies. The steps of the methodology are as follows: a) stationarity test; b) cointegration test; c) VAR/vector error correction model (VECM); d) IRF.

H2: The level of government debt influences the economic performance of a country.

3.1.3. Impact of fiscal policy on public debt management

This research question aims to find the impact of fiscal policy on the public debt management system across the five upper-middle-income economies. As a result, this segment will use a qualitative study where a systematic literature review will be used.

H3: Fiscal policy significantly influences public debt management.

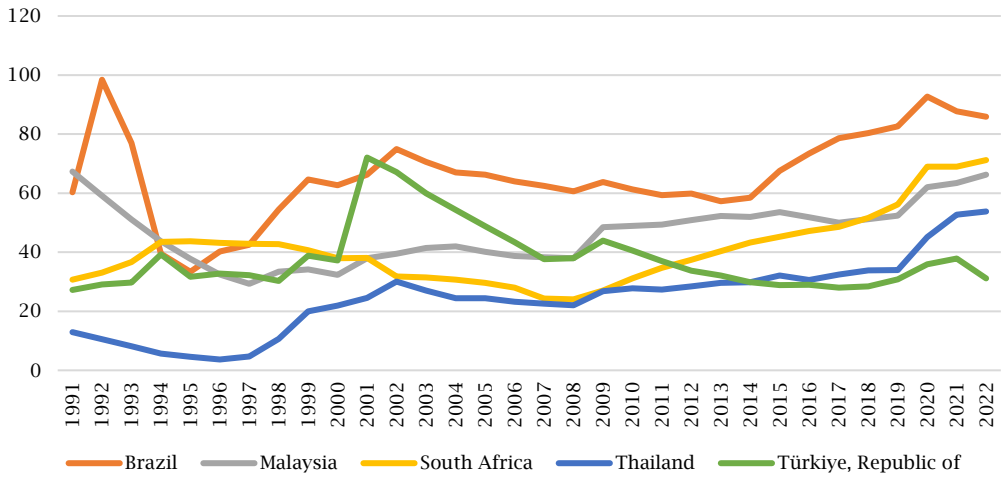
4. RESULTS

This segment of the research will provide the results of the quantitative as well as the qualitative analysis that has been discussed in the previous section.

4.1. Evolution of public debts over time

The public debts over the years have shown a significant increase in the trends. Figure 1 represents a time series representation of the central government debt as a percentage of the GDP between 1991 and 2022 for five countries. From the analysis, it could be realised that the Brazilian government debt increased substantially to almost 100 per cent of the GDP in 1992. In the following years, the debt as a percentage of GDP plummeted till 1995. Post 1995, the public debt in Brazil increased steadily over the next decades. On the other hand, the economy of Malaysia experienced a decreasing trend in public debt till the late 1990s. However, with the turn of the century, Malaysia also experienced a steady rise in government debts over the years. Similar to Malaysia, the South African economy also experienced a steady fall in government debts till 2008. However, after the Global Financial Crisis in 2008, the central government debt as a percentage of the GDP experienced a steady rise in South Africa. The economy of Thailand had the least amount of government debt till the early 2000s. Post 2002 the amount of debt as a percentage of GDP remained stable till 2019. Although, the trend has been on the rise since 2020. Finally, for Turkey, the central government debt spiked significantly in 2001. Post this period, the debt as a percentage of GDP has been on the fall, unlike other countries in the study.

Figure 1. The central government debt levels as a percentage of GDP across Brazil, Malaysia, South Africa, Thailand and Turkey between 1991 and 2022



4.2. Impact of public debt on the economic performance:

4.2.1. Augmented Dickey-Fuller test

In order to perform the subsequent empirical analyses, this paper tests the unit root using the augmented Dickey-Fuller test first. The results are shown in Table 1. From the table, it is evident that the economic variables of the five countries are all stationary in nature.

Table 1. Augmented Dickey-Fuller test for dependent and independent variables

Variable	*Brazil*	*Malaysia*	*Africa*	*Thailand*	*Turkey*
Government debt	-3.674	-5.025	-2.726	-3.535	-4.446
	(0.0045)	(0.0000)	(0.0311)	(0.0071)	(0.0002)
GDP growth rate	-3.591	-4.889	-3.737	-3.938	-4.025
	(0.0059)	(0.0000)	(0.0036)	(0.0018)	(0.0013)
Inflation rate	-5.362	-3.742	-3.794	-4.732	-4.095
	(0.0000)	(0.0036)	(0.0030)	(0.0001)	(0.0010)
Unemployment rate	-2.953	-5.895	-5.682	-6.019	-4.171
	(0.0395)	(0.0000)	(0.0000)	(0.0000)	(0.0007)
Consumption expenditure	-4.522	-4.729	-4.607	-3.981	-4.367
	(0.0002)	(0.0001)	(0.0001)	(0.0015)	(0.0003)

Note: MacKinnon approximate p-value in parentheses.

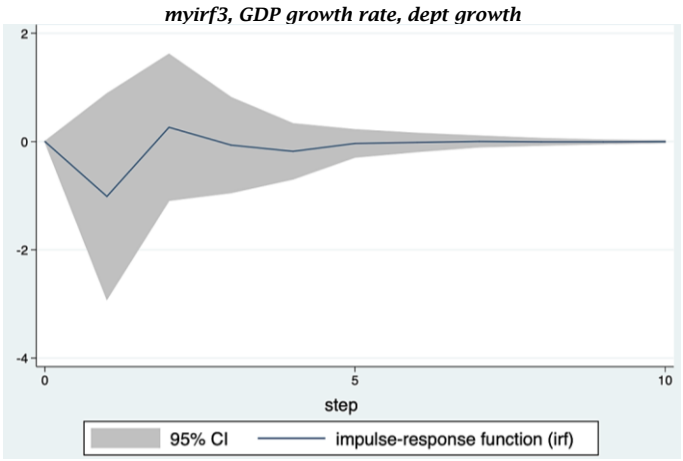
4.2.2. Brazil

As the variables in the study are stationary at the initial point, a VAR analysis could be used. The VAR approach identifies the impact of public debt on economic performance. The lag length selection criteria that have been identified using Appendix show that using the final prediction error (FPE) criteria, selection of up to one lag is suitable. From the VAR analysis that has been represented in Table 2, it could be realised that a change in public debt has a negative impact on the GDP growth rate till the first lag. Moreover, the eigenvalue stability condition is also analysed to gauge the robustness of the model. Appendix shows that the moduli are within the unit root circle. The impact is further deciphered using the IRF in Figure 2. The figure also shows that the change in public debt causes a negative impact on the GDP growth rate in Brazil. The same is represented in Table 3.

Table 2. VAR model for the impact of government debt on GDP growth rate in Brazil

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-0.2355	0.1379	-1.71	0.088	-0.5059	0.0348

Figure 2. Impulse response function for GDP growth rate in Brazil



Note: Figures by irfname, impulse variable and response variable.

Table 3. Impulse response function for GDP growth rate in Brazil

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-1.0311	0.8136	-1.27	0.205	-2.6257	0.5636
L2.	-2.9384	0.8697	-3.38	0.001	-4.6429	-1.2339

4.2.3. Malaysia

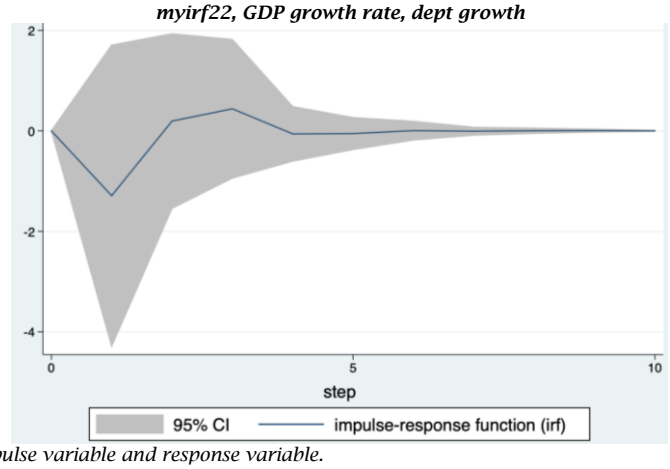
The study performs a VAR model to estimate the impact of public debt on the economic performance of a country. In order to conduct a VAR model, the lag has been estimated through the FPE test statistic. According to Appendix, the FPE test statistic estimates 1 lag to be suitable for the model. Therefore, the VAR model has been conducted using 1 lag for Malaysia. Table 4 represents the VAR results for Malaysia. The model is also stable as the moduli are within the unit circle as shown in Appendix.

Table 4. VAR model for the impact of government debt on GDP growth rate in Malaysia

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-1.2905	1.5290	-0.84	0.399	-4.2873	1.7062

The results of the VAR model conclude that the GDP growth rate is positively dependent up to -1.2905 per cent using the first lag. However, these variables are statistically insignificant as the p-value is greater than 0.05. Based on the VAR model, the study conducts an IRF. The results are shown in Table 5. The IRF using the 2 lag shows that there is a negative impact on the GDP growth rate because of a 1 per cent increase in government debt. The GDP growth decreases by -0.0753 percentage point when the debt increases in the previous period using 2 lags. The coefficient is also statistically significant as the p-value is less than 0.05. The same is shown graphically in Figure 3.

Figure 3. Impulse response function for GDP growth rate in Malaysia



Note: Figures by irfname, impulse variable and response variable.

Table 5. Impulse response function for GDP growth rate in Malaysia

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	0.1700	0.1457	1.17	0.243	-0.1156	0.4556
L2.	-0.0753	0.1536	1.78	0.075	-0.3764	0.2257

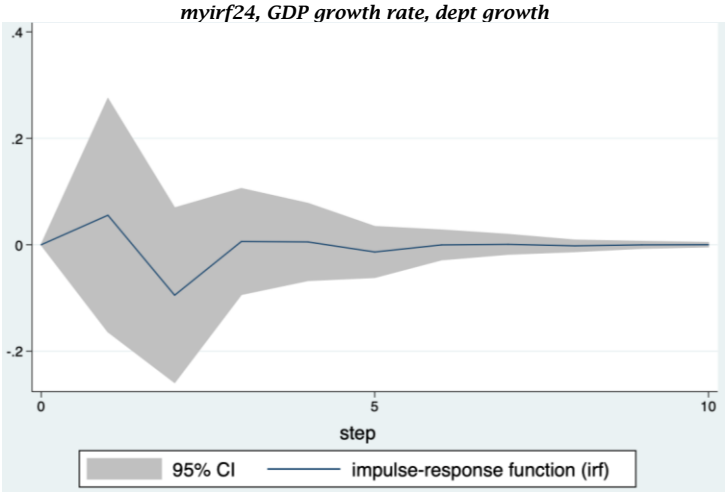
4.2.4. South Africa

Based on the previous statistics, the study performs a VECM. Based on the lag selection criteria in Appendix the first lag is selected using the FPE criteria. The results for the VECM model using 1 lag are shown in Table 6. Using the model, it could be observed that the GDP growth rate is dependent on the previous lags by -1.0912 percentage points. Although, the coefficient is statistically not significant. An eigenvalue stability condition in Appendix shows the moduli are within the unit circle. An IRF is also conducted to gauge the impact of change in government debt on GDP growth rate. From Table 7, it could be observed that a percentage change in government debt can cause a GDP growth rate of 2.57 per cent in South Africa. Moreover, the coefficient is also statistically significant as the p-value is less than 0.05. The IRF is further graphically presented in Figure 4.

Table 6. VECM model for the impact of government debt on GDP growth rate in South Africa

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-1.0912	1.0744	-1.02	0.310	-3.1969	1.0146

Figure 4. Impulse response function for GDP growth rate in South Africa



Note: Figures by irfname, impulse variable and response variable.

Table 7. Impulse response function for GDP growth rate in South Africa

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	2.5703	1.85e-13	1.4e+13	0.000	2.57	2.57

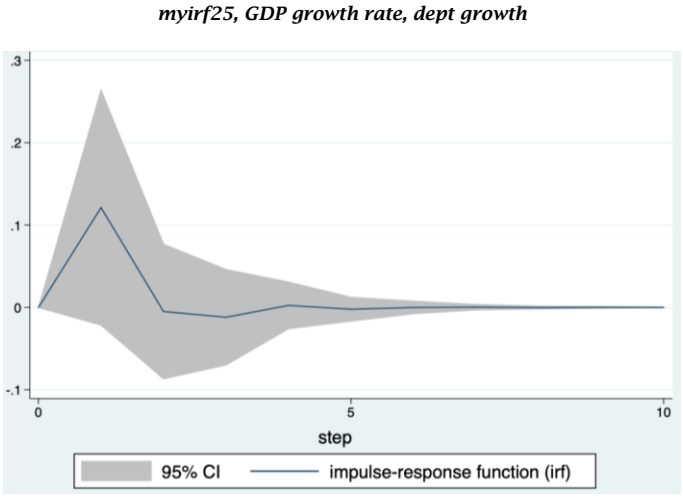
4.2.5. Thailand

The results of the VAR model using 1 lag is shown in Table 8. The table shows that for Thailand, the GDP growth rate is negatively related to the previous lags by -1.4808 percentage point. The test statistic is also statistically significant as the p-value is less than 0.05. The eigenvalue stability condition is also shown in Appendix which concludes the moduli are within the unit circle. On the basis of the VAR, an IRF is also conducted to calculate the impact on the GDP growth rate for Thailand. Table 9 represents the value of the IRF. In Thailand, there is a negative relationship between the GDP growth rate and the growth of government debt in previous years. The coefficient of the same is -2.4879 percentage points. Moreover, this relationship is statistically significant. Figure 5 represents the same graphically.

Table 8. VAR model for the impact of government debt on GDP growth rate in Thailand

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-1.4808	1.0648	-1.39	0.164	-3.5678	0.6062

Figure 5. Impulse response function for GDP growth rate in Thailand



Note: Figures by irfname, impulse variable and response variable.

Table 9. Impulse response function for GDP growth rate in Thailand

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-2.4879	0.80696	-3.08	0.002	-4.0695	-0.9063

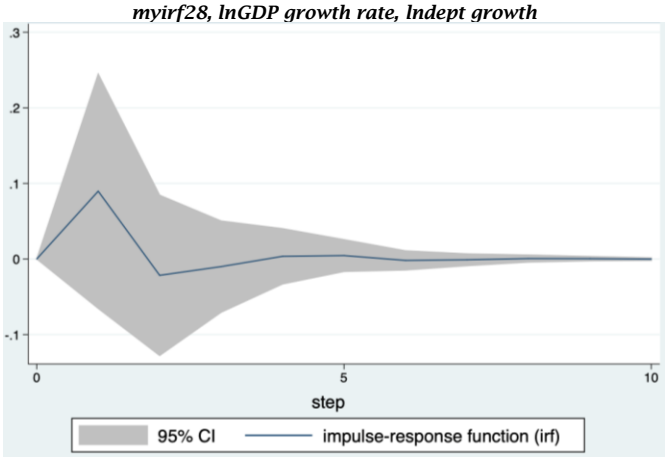
4.2.6. Turkey

As the variables are stationary in nature, a VAR is performed using them. The second lag is selected for the model using the FPE lag selection criteria shown in Appendix. From the results of the VAR shown in Table 10, it could be realised that there is a negative impact on the GDP growth rate using the previous lags. The coefficients are not statistically significant as the p-value is under 0.05. Appendix shows the model is stable as the moduli are within the unit circle. Finally, an IRF for the model is also shown. Table 11 shows the results of the IRF. From the table, it could be realised that the GDP growth rate is negatively impacted by an increase in debt by a percentage of previous quarters by -1.4811 percentage. This relation is also statistically significant as the p-value is less than 0.05. The same is shown graphically in Figure 6.

Table 10. VAR model for the impact of government debt on GDP growth rate in Turkey

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-0.0257	0.3918	-0.07	0.948	-0.7936	0.7422

Figure 6. Impulse response function for GDP growth rate in Turkey



Note: Figures by irfname, impulse variable and response variable.

Table 11. Impulse response function for GDP growth rate in Turkey

Variables	*Coef.*	*Std. err.*	*z*	*P > |z|*	*[95% conf. interval]*	
GDP growth rate						
L1.	-1.4811	0.4874	-3.04	0.002	-2.4364	-0.5257

4.3. Impact of fiscal policy on public debt management

The fiscal policy of an economy affects the public debt of an economy. This subsection will analyse empirical pieces of literature in order to gauge the impact of the same. Debt management was not always considered a standalone fiscal policy. However, with rising debts across nations, it has evolved into an important indicator. A recent study by Hodula and Melecký (2020) used an factor-augmented vector autoregression (FVAR) analysis in order to find the relationship between fiscal policy and debt management. The results of the study showed that fiscal policy plays a critical role in altering the debt management policy of a country. The same study also concludes that fiscal policies are important to understanding the sovereign debt risk of a country. This shows that fiscal policies are viewed as significant instruments to manage sovereign debts. Another research by Gomez-Gonzalez et al. (2022) uses a probit model in order to find the effect of the same. The study suggests that stable fiscal policies are important in order to maintain economic stability. Moreover, the fiscal measures make sure the consumption and investment cycle within the economy is maintained. This results in a reduction of sovereign default risk for both developed and emerging economies. A fiscal policy also provides significant flexibility to the fund management of the sovereign. An empirical study by Debortoli et al. (2022) uses a primal approach to gauge the impact of fiscal policy on public debt management. The paper concludes that optimal fiscal management helps in debt management because it allows the government to reoptimize the debts sequentially. Moreover, it provides stability over the government bond prices within the present as well as the future time periods. As a result, based on such flexible policies, the government can reduce debt financing costs as well. This makes the fiscal policy an integral instrument to efficiently manage public debts. Finally, a stable fiscal policy also provides the economy with institutional transformation. This transformation allows the economy to make flexible budgetary policies.

5. DISCUSSION

5.1. Discussion of the impact of government debt on economic growth

On the basis of the results, it could be understood that the government debt in Brazil has risen over the time period of the study. Cantú et al. (2020) in their study found that the inefficient fiscal system in Brazil caused a high level of government debts. Brazil's failure to accumulate stable funds led to an increased external debt. Similarly, the government debt in Malaysia also increased over the period of this study. According to Aslam and Jaafar (2020), the Malaysian economy also faced a significant budgetary deficit due to the global financial crisis. According to this study, inadequate generations of taxed and non-tax expenses which raise the expenses greater than the revenue is the main cause behind these budget deficits. As a result, the Malaysian government had to adhere to borrowings from the local or foreign market. This has been one of the main reasons behind the increasing trend of central government debt in Malaysia. Moreover, the same study by Aslam and Jaafar (2020) has also concluded that the acquisition of finance through bonds is crowding out private investments. This is leading to a further requirement for public borrowings in the economy. The economy of Thailand also faced a similar trend of growing government debts over the past few decades. However, the developing nature of the Thai economy has also caused a significant amount of budgetary deficits (Lau & Lee, 2016). This led to the economy adhering to external borrowings apart from government revenue. Moreover, the external shocks

of the COVID-19 pandemic as well as the Asian Financial Crisis also forced the economy to borrow from external sources in order to back a stable fiscal spending on growth and development. This has been the main reason behind the growing nature of government debt in Thailand.

The South African economy has shown one of the most rapid growth of government debts among all the other economies. This rapid rise of government debt in the South African economy is propelled by poor economic growth, high levels of unemployment and high levels of economic inequality (Hlongwane & Daw, 2023). Moreover, the government maintained a high level of government spending during this same period of time. As a result, South Africa became heavily dependent on external financing which caused high levels of public debt. Moreover, the same study by Hlongwane and Daw (2023) also reveals that public industries in South Africa failed to generate a relative amount of revenue. This resulted in a substantial need for external funding in South Africa. The Turkish economy showed a different trend of a fall in central government debt when compared to other economies in the study. This is because of the financial structure of the Turkish economy as well as a lack of confidence in the Turkish economy. Moreover, the Turkish government adhered to foreign exchange instead of government borrowings in order to defend the lira (Setser, 2023). This led to the decreasing trend of government debt in Turkey. This discussion on the trends in government debt showcases that all economies except Turkey had an increasing trend between 2008 and 2019. Although, post-2020 because of the COVID-19 pandemic, the government debt increased for all economies.

The IRF that has been used on all the economies also shows a varied response with respect to an increase in government debt on the economic performance. Economies like Brazil, Malaysia, Thailand and Turkey show a negative impact of government debt on economic performance. Although, South Africa is the sole economy showing a positive impact of a rise in government debt on economic performance. This variety in response can happen because of a number of factors. The institutional quality of Brazil has been a major factor that led to a downfall in economic growth over the years (Doré & Teixeira, 2023). Moreover, the Brazilian economy has been through a number of structural changes over the years. This also played an important role in shrinking the economic growth. As a result, high levels of inflation and unemployment grappled the Brazilian economy over the years. This shows that the level of public debt is not the sole cause that leads to a fall in economic growth. The cointegration between the variables plays a critical role in determining such a relationship between the both. The institutional quality as well as the structural changes also caused imbalances within the fiscal policy of Brazil. As a result, these factors resulted in negative outcomes.

The Malaysian economy has increased the amount of government debt as a percentage of GDP over the years. One of the main reasons behind such an increase would be to support fiscal spending in order to move out of the middle-income trap (Hassan & Masih, 2017). However, the IRF shows that there would be a negative impact of an increasing government debt on economic growth. This is also because a substantial increase in debts could accumulate into a significantly high value. This would cause an added burden on the fiscal budget of Malaysia, impacting consumption expenditure (Cheong et al., 2022). As a result, if the consumption expenditure is impacted in an economy, the demand and supply balance is also impacted. This causes a slowdown of the economic growth, hence causing a negative impact on the GDP growth. Moreover, the impact on the Malaysian economy has been limited because of sound fiscal interventions. The Government of Malaysia (2023) set the overall debt level to 65 per cent of the GDP. This fiscal risk management in Malaysia was deemed to be critical in managing government debt as well as impact on growth levels.

A similar trend could also be observed in economies like Thailand. The economy of Thailand had to increase its government debts significantly in the past years to support fiscal expenditures. However, the effects of such debts have a negative impact on economic growth as shown through the IRF. This negative weight on economic growth comes to Thailand as a residue of the global economic slowdown (Asian Development Bank, 2023). The economic slowdown also caused a shrinkage of Thai exports which caused a negative impact on the economic growth. Moreover, the correlation among the variables also plays a substantial role in such negative outcomes. However, the negative effects on the economy are significantly marginal in nature. This is because of the monetary and fiscal interactions across developing Asian economies. For instance, countries like Thailand have adhered to a stable fiscal policy that backed a sustainable debt-to-GDP ratio of 70 per cent (World Bank, 2022). This makes the negative impact on the Thai economy more calculated in nature.

The Turkish economy has accumulated an unsustainable amount of sovereign debt over the years. This has put the economy on the verge of a sovereign debt crisis. Moreover, the financial crisis in the economy has pushed up the need for external funding (Setser, 2023). However, this financial crisis also has shrunk the economic growth in the Turkish economy. This caused negative impacts on domestic production and consumption. As a result, the increasing government debt has a negative impact on economic growth. Moreover, the high cost of financing and debt servicing also causes a negative impact on the fiscal budget (Uslu, 2021). This negative impact on the fiscal budget reduced the magnitude of government investments in consumption expenditure. As a result, the external debt shocks have impacted the economic growth in Turkey.

Finally, with respect to South Africa, it could be observed that the IRF shows a growth in the GDP with an increase in the government debt. This has mostly been propelled by structural and institutional changes in the functioning of the government. These changes in the government functioning allowed efficient allocation of resources across the economy of South Africa. Moreover, as the economy faces an energy crisis, investment in the economy is assumed as a critical driver behind the economic

growth (Organisation for Economic Co-operation and Development [OECD], 2023). This shows that the investments made in the economy over the past few years with the support of external funding have been directly integrated into the economy. This comes as a driving force behind propelling the economic growth in South Africa. Moreover, the South African economy was on the verge of a debt crisis. However, efficient fiscal measures and debt management by the government allowed the country to resolve such crises (Hlongwane, 2023). This further solidifies the stance of economic growth in South Africa as well as the importance of fiscal measures to assist public debt management in the nation.

The results of this study also provide significant implications and insights to policymakers across such upper-middle-income economies. Public debt is often seen as an alternative method of funding for economies with low fiscal revenue. Although, the level of government debt often impacts the economy by limiting growth. Through this research, it could be found that in the present economic conditions, government debt can have a negative impact on such middle-income emerging economies.

5.2. Policy implications and recommendations for debt management

From the analysis, it could be observed that most countries have a growing trend in sovereign debt. However, the fiscal policies of the governments should also focus on debt management. For economies like Brazil where the political institution is unstable in nature, the government must focus on an enhanced fiscal framework that could tackle the rigidities in the public expenditure. This would provide the economy with much-needed flexibility to tackle the rising debt-to-GDP ratio. Similar policies could be also followed by South Africa which has been on the verge of a debt crisis. Even though South Africa has implemented strict fiscal measures to counter the growing government debt amidst weak economic growth, it still can improve the vulnerabilities regarding such debts. Economies like Malaysia and Thailand could focus on ensuring fiscal sustainability and minimizing risks associated with high debt levels. As a result, the economy could work towards growing the base for government revenue by increasing tax revenue (Karia, 2021). This would allow emerging economies like Thailand and Malaysia to be self-sustainable. As a result, these economies would be less dependent on external financing thereby managing their government debts.

6. CONCLUSION

This particular research dealt with gauging the impact of government debt on the economic growth of various upper-middle-income economies. An analysis conducted across Brazil, Malaysia, South Africa, Thailand and Turkey has explained that government debt has been on the rise over the past decades in most economies. Furthermore, the external shocks created by the COVID-19 pandemic have resulted in a significant spike post-2020. The study conducted a VECM analysis as well as an IRF to account for the impact on economic growth. The data analysis shows that government debt has caused a negative effect on the economic growth of economies such as Brazil, Malaysia, Thailand and Turkey. However, these impacts have been very marginal in nature. Moreover, it could be understood that debt levels alleviate the debt pressure, which in turn suppresses economic growth. The results of the study also find that there is a complex correlation between economic indicators such as GDP growth rate, inflation rate, consumption expenditure, unemployment and government debt levels. This is because of the fiscal structure of the economy which interconnects the impacts of such variables. Overall, it could be said that government debt may contribute to economic growth, but excessive debt levels may pose risks to economic stability thereby limiting the level of growth.

The main significance of this study is that a detailed comparison and in-depth analysis of government debt and its impact on economic growth has been done across different upper-middle-income economies. Moreover, the study provides a clear understanding of the complex relationship between government debt and economic growth. Therefore, the results of the study provide significant implications for policy formulation and debt management to various world governments as well as financial institutions. The impact that government debt has on the economic performances of various economies also shows the importance of institutional capacity that is required for economies to be more sustainable. In addition, this study has also made certain contributions to existing economic literature. Although the relationship between government debt and economic growth has been widely studied, there is relatively little in-depth comparison and analysis based on upper-middle-income economies.

This particular paper also uses a robust methodological foundation of the VECM model as well as the IRF model to gauge the impact that government debt has on the economic performance of certain countries. This provides a substantial methodological foundation for future research. Moreover, the uniqueness of the study in conducting a cross-country analysis also opens a number of avenues for further studies. Finally, the focus of the paper on upper-middle-income economies contributes significantly to the economic literature by addressing the impact of government debt on economic growth. On the basis of these foundations, future research could also look to include studies on lower-income and higher-income economies. This would allow for a more comprehensive understanding of the global economic dynamics.

Despite providing robust outputs regarding the impact of government debt on the economic performance of the countries, the study also has a number of limitations. The emphasis on upper-middle-income economies limits the generalizability of findings. As a result, a similar level of policy application could not be levied on low-income economies or high-income economies. Moreover, the paper also fails to account for the unique nature of the institutional capacities of each of the countries. As a result, this leads to a more homogenous approach, which also limits the generalisation of the discussions of the paper.

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APPENDIX

Table A.1. Lag length selection, Brazil

lag	*LL*	*LR*	*df*	*p*	*FPE*	*AIC*	*HQIC*	*SBIC*
0	-169.317	-	-	-	4.0e + 07	31.694	31.58	31.8748
1	-108.568	121.5	25	0	116898*	25.1941	24.5101	26.2793
2	1604.12	3425.4	25	0	-	-281.658	-282.912	-279.668
3	1691.92	175.6	25	0	-	-297.621	-298.875	-295.632
4	1684.05	-15.73	25	-	-	-296.191	-297.446	-294.202
5	1712.88	57.661	25	0	-	-301.433	-302.687	-299.444
6	1723.48	21.187	25	0.682	-	-303.359	-304.613	-301.37
7	1741.54	36.132	25	0.07	-	-306.644	-307.898	-304.655
8	1742.76	2.4331	25	1	-	-306.865	-308.119	-304.876
9	1744.17	2.8231	25	1	-	-307.122	-308.376	-305.132
10	1763.21	38.081**	25	0.045	-	-310.584**	-311.838**	-308.594**
11	1746.95	-32.519	25	-	-	-307.628	-308.882	-305.638
12	1735.54	-22.822	25	-	-	-305.553	-306.807	-303.563

Note: LL is log likelihood, LR is likelihood ratio, FPE is final prediction error, AIC is Akaike information criterion, HQIC is Hannan-Quinn information criterion, SBIC is Schwarz Bayesian information criterion.
** denotes 10% significance level, ** denotes 5% significance level and *** denotes 1% significance level.*

Figure A.1. Eigenvalue stability condition, Brazil

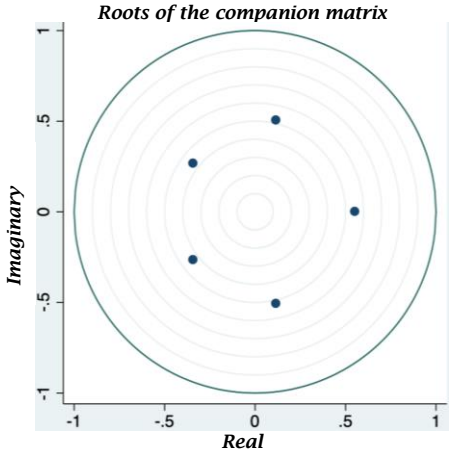

Table A.2. Lag length selection, Malaysia

lag	*LL*	*LR*	*df*	*p*	*FPE*	*AIC*	*HQIC*	*SBIC*
0	-174.264	-	-	-	9.9e + 07	32.5934	32.4794	32.7743
1	-124.793	98.941	25	0	2.2e + 06**	28.1442	27.4602	29.2294
2	1643.68	3536.9	25	0	-	-288.85	-290.104	-286.861
3	1666.41	45.456	25	0.007	-	-292.983	-294.237	-290.993
4	1687.99	43.172	25	0.013	-	-296.908	-298.162	-294.918
5	1708.9	41.81**	25	0.019	-	-300.708	-301.963	-298.719
6	1708.12	-1.562	25	-	-	-300.566	-301.821	-298.577
7	1720.75	25.267	25	0.447	-	-302.863**	-304.118**	-300.874**
8	1686.28	-68.931	25	-	-	-296.597	-297.851	-294.608
9	1701.7	30.833	25	0.195	-	-299.4	-300.654	-297.411
10	1708.42	13.44	25	0.971	-	-300.622	-301.876	-298.632
11	1708.42	0	25	-	-	-300.622	-301.876	-298.632
12	1708.42	0	25	-	-	-300.622	-301.876	-298.632

Note: LL is log likelihood, LR is likelihood ratio, FPE is final prediction error, AIC is Akaike information criterion, HQIC is Hannan-Quinn information criterion, SBIC is Schwarz Bayesian information criterion.
** denotes 10% significance level, ** denotes 5% significance level and *** denotes 1% significance level.*

Figure A.2. Eigenvalue stability condition, Malaysia

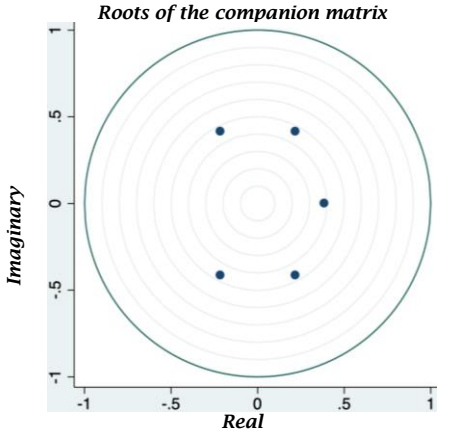

Table A.3. Lag length selection, South Africa

lag	*LL*	*LR*	*df*	*p*	*FPE*	*AIC*	*HQIC*	*SBIC*
0	-146.438	-	-	-	626165	27.5342	27.4202	27.7151
1	-109.934	73.01	25	0	149853*	25.4425	24.7584	26.5276
2	1717.55	3655	25	0	-	-302.281	-303.535	-300.292
3	1726.65	18.212	25	0.833	-	-303.937	-305.191	-301.947
4	1740.27	27.236	25	0.344	-	-306.413	-307.667	-304.423
5	1763.67	46.805	25	0.005	-	-310.668	-311.922	-308.678
6	1787.36	47.383	25	0.004	-	-314.975**	-316.229**	-312.986**
7	1763.28	-48.165	25	-	-	-310.597	-311.851	-308.607
8	1741.53	-43.511	25	-	-	-306.641	-307.895	-304.652
9	1745.4	7.7444	25	1	-	-307.345	-308.599	-305.356
10	1725.95	-38.901	25	-	-	-303.809	-305.063	-301.819
11	1730.5	9.1052	25	0.998	-	-304.636	-305.891	-302.647
12	1750.62	40.249**	25	0.027	-	-308.295	-309.55	-306.306

Note: LL is log likelihood, LR is likelihood ratio, FPE is final prediction error, AIC is Akaike information criterion, HQIC is Hannan-Quinn information criterion, SBIC is Schwarz Bayesian information criterion.
** denotes 10% significance level, ** denotes 5% significance level and *** denotes 1% significance level.*

Figure A.3. Eigenvalue stability condition, South Africa

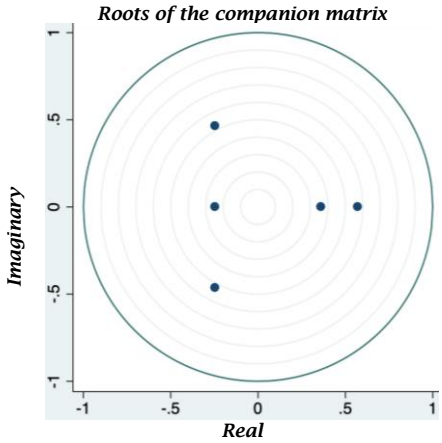

Table A.4. Lag length selection, Thailand

lag	*LL*	*LR*	*df*	*p*	*FPE*	*AIC*	*HQIC*	*SBIC*
0	-212.028	-	-	-	9.5e+10**	39.4597	39.3457	39.6405
1	-185.276	53.504	25	0.001	1.3e+11	39.1411	38.4571	40.2263
2	1644.71	3660	25	0	-	-289.039	-290.293	-287.049
3	1687.78	86.126	25	0	-	-296.868	-298.122	-294.879
4	1720.37	65.193	25	0	-	-302.795	-304.049	-300.806
5	1669.44	-101.87	25	-	-	-293.534	-294.788	-291.544
6	1714.91	90.95*	25	0	-	-301.802	-303.056	-299.812
7	1718.77	7.7222	25	1	-	-302.504	-303.758	-300.514
8	1733.48	29.417	25	0.247	-	-305.178	-306.432	-303.189
9	1723.36	-20.251	25	-	-	-303.337	-304.591	-301.348
10	1733.64	20.564	25	0.717	-	-305.207**	-306.461**	-303.217**
11	1715.61	-36.062	25	-	-	-301.928	-303.182	-299.939
12	1731.12	31.037	25	0.188	-	-304.75	-306.004	-302.76

Note: LL is log likelihood, LR is likelihood ratio, FPE is final prediction error, AIC is Akaike information criterion, HQIC is Hannan-Quinn information criterion, SBIC is Schwarz Bayesian information criterion.
** denotes 10% significance level, ** denotes 5% significance level and *** denotes 1% significance level.*

Figure A.4. Eigenvalue stability condition, Thailand

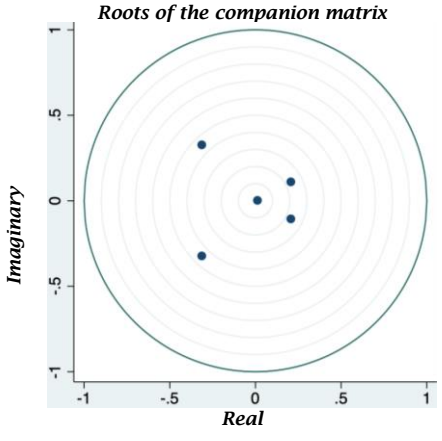

Table A.5. Lag length selection, Turkey

lag	*LL*	*LR*	*df*	*p*	*FPE*	*AIC*	*HQIC*	*SBIC*
0	-151.969	-	-	-	3.0e + 07	31.3937	31.2277	31.545
1	-	-	25	-	-3.3e - 09**	-	-	-
2	1475.66	-	25	-	-	-285.132	-286.792	-283.619
3	1572.2	193.07	25	0	-	-304.439	-306.099	-302.927
4	1559.47	-25.451	25	-	-	-301.894	-303.554	-300.381
5	1581.77	44.593**	25	0.009	-	-306.354	-308.013	-304.841
6	1589.06	14.586	25	0.951	-	-307.812	-309.472	-306.299
7	1582.84	-12.436	25	-	-	-306.569	-308.228	-305.056
8	1587.04	8.3955	25	0.999	-	-307.408	-309.068	-305.895
9	1585.08	-3.9267	25	-	-	-307.015	-308.675	-305.503
10	1599.45	28.743	25	0.275	-	-309.89	-311.55	-308.377
11	1604.53	10.166	25	0.996	-	-310.906	-312.566	-309.394
12	1622.55	36.032	25	0.071	-	-314.51**	-316.169**	-312.997**

Note: LL is log likelihood, LR is likelihood ratio, FPE is final prediction error, AIC is Akaike information criterion, HQIC is Hannan-Quinn information criterion, SBIC is Schwarz Bayesian information criterion.
** denotes 10% significance level, ** denotes 5% significance level and *** denotes 1% significance level.*

Figure A.5. Eigenvalue stability condition, Turkey