DOI: 10.20472/IAC.2015.016.042

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EXTERNAL DEBT AND ECONOMIC GROWTH NEXUS: EVIDENCE FROM MALAYSIA, THAILAND AND PHILIPPINES

Abstract:

This study aims to examine the contribution of external debt to economic growth in three countries namely; Malaysia, Thailand and the Philippines. To discern the causal chain linkages among the I(1) macroeconomic variables typically utilized to test the connection between external debt and economic growth, several econometric procedures are employed in this study. By employing the cointegration test, the results reveal the existence of one unique long-run relationship among the variables for Malaysia while two cointegrating vectors are identified for both Thailand and the Philippines. From the results, it is evident that both the growth-driven exports and export-led growth hypothesis exist in Malaysia and Thailand respectively. The dynamic econometric analysis finds that exports of goods and services appear to be the most leading variable beyond the sample for the next 50 years. The findings from the study recommend the policy makers should formulate effective debt management policies to monitor the amount of external borrowings so that the accumulation of external debt will not hinder the economic growth.

Keywords:

External Debt; Economic Growth; Malaysia; Thailand; Philippines.

JEL Classification: F34, F43, H63

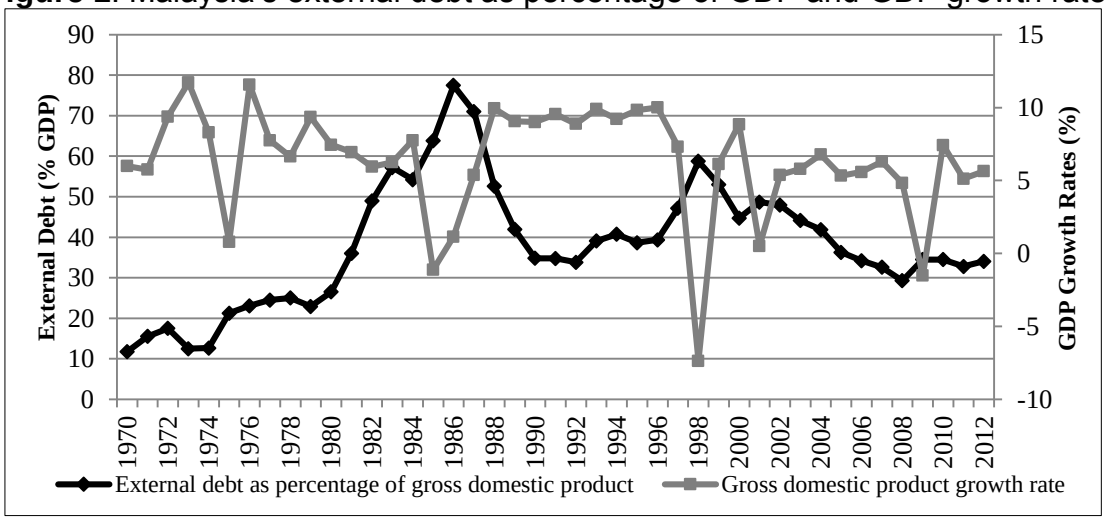
Acknowledgement
The authors gratefully acknowledges financial support from the Ministry of Education (MOHE) Malaysia [RACE/e(2)/1101/2014(09)]. The usual disclaimer regarding errors and omissions applies.

1. INTRODUCTION

Economic growth is determined by various factors and one of them is debt. Debt or borrowing is a crucial element in financing development, whereby a country borrows to boost long term productivity and economic output as well as to improve in human development. The impact of external debt on economic growth in the developing countries has attracted considerable attention of researchers in recent decades. Although many empirical studies have been conducted to investigate the impact of external debt on economic growth; however, the results are ambiguous indicating that there is no consensus on the role of external debt on growth. Majority of the existing studies report a negative impact of external debt accumulation on economic growth with the different employment of methodological techniques. A leading explanation for negative relationship is debt-overhang hypothesis, which means with the very high levels of debt, the government has no incentives to carry out macroeconomic reforms and policies as the returns of these policies will only be used to repay outstanding debt (Bakar and Hassan, 2008).

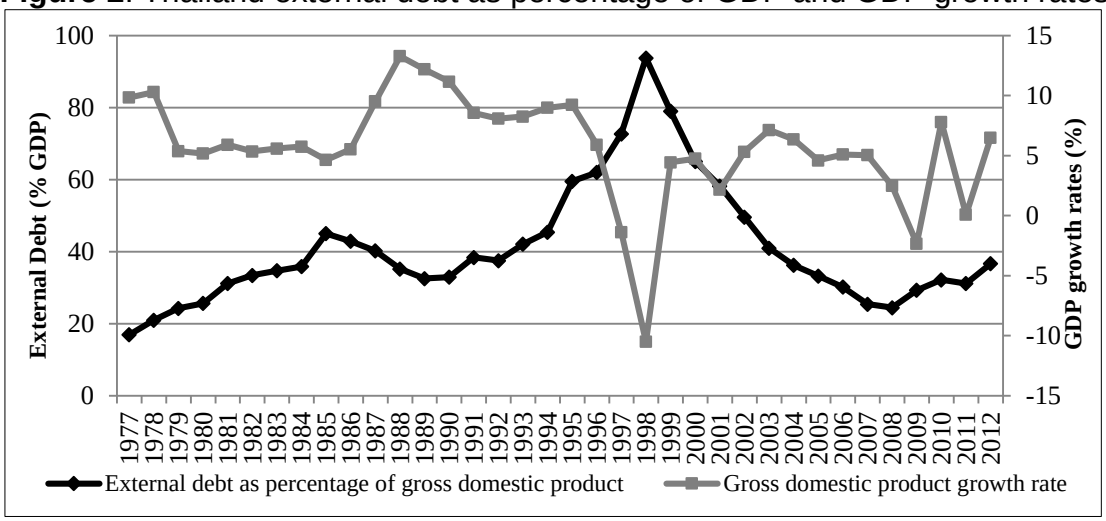
As debt is another financing alternative of government expenditure, the government of a nation will seek to borrow as the tax revenues are insufficient to finance all the expenditures that has budgeted. Malaysia recorded the highest debt level at 77 percent as a percentage of GDP and GDP growth slumped in 1986 (Figure 1). During the Asian Financial Crisis in 1997-1998, the external debt reached around 59 percent and the GDP growth in 1998 while GDP growth rate drop to negative 7 percent. Meanwhile Thailand recorded the highest external debt as percentage of GDP at around 94 percent in 1998 while the GDP growth rate was dragged and slumped drastically in 1998 due to the Asian Financial Crisis (Figure 2). These can be seen clearly that there is a negative impact of external debt in economic growth in Thailand. The GDP growth in the Philippines declined sharply starting from 1982 to 1984 because of the oil price slump. The GDP growth rate was apparently influenced by the external debt. As illustrated in Figure 3, the external debt showed an increasing trend and recorded the highest figure at about 94 percent as a proportion of GDP in 1986.

Figure 1: Malaysia's external debt as percentage of GDP and GDP growth rates



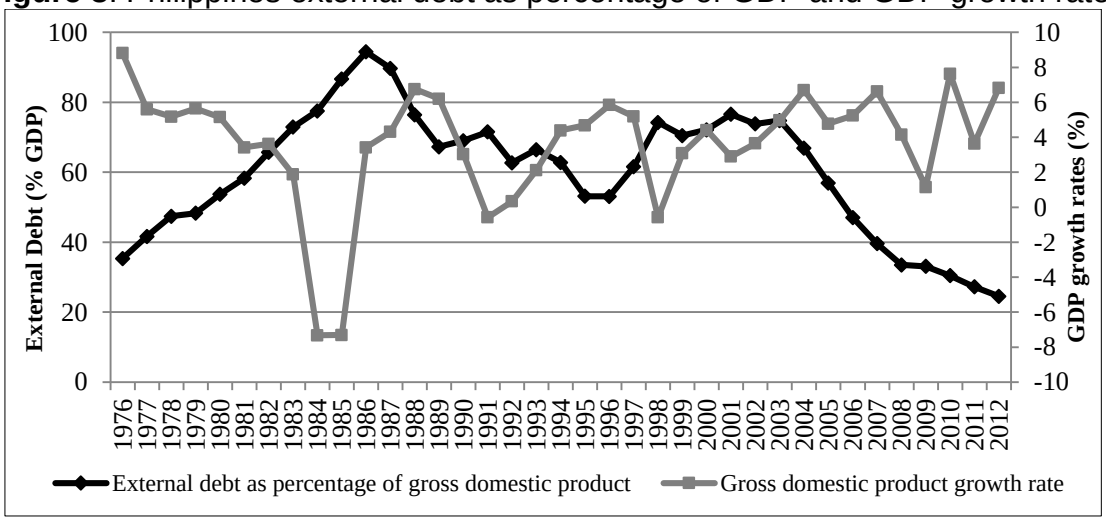
Source: Economic Planning Unit (EPU) and World Development Indicators (WDI).

Figure 2: Thailand external debt as percentage of GDP and GDP growth rates



Source: Ministry of Finance Thailand and World Development Indicators (WDI)

Figure 3: Philippines external debt as percentage of GDP and GDP growth rates



Source: Bureau of Treasury Philippines and World Development Indicators (WDI)

With the outbreak of sovereign debt crisis in the European countries in 2009, the rising debt problem has become one of the main challenges faced by all of the countries around the world. The three countries selected in this study are developing countries that have implemented a prudent debt management policy, have shown an increasing trend of total outstanding external debt. This has raised concerns about whether external borrowing could hinder economic growth in Malaysia, Thailand and Philippines. With the increasing external debt level, would these countries be in either debt default in the near future? Therefore, we would like to examine the relationship between external debt and economic growth which could serve as a signal about the efficiency of existing debt management and policies in these three countries. The rest of the paper is organized as follows. Section 2 presents the theory and related literature on the economic growth and external debt while section 3 explains the data issues and methodology employed in this study. Section 4 reports the empirical results. Lastly, section 5 concludes the overall findings.

2. THEORY AND RELATED LITERATURE

Economic development is one of the foremost objectives of every economy in the world and economic growth is primary to economic development. There are many factors contributed to economic growth and one of them relies on the export-led growth (ELG) hypothesis. The export-led growth (ELG) hypothesis suggests that export growth is one of the key factors in promoting economic growth. It holds that the overall growth of countries can be generated not only by increasing the amounts of labor and capital within the economy, but also by expanding exports. According to the ELG theory, exports can perform as an engine of growth. The relationship among exports and growth is often attributed to the possible positive externalities for the domestic economy arising from participating in world markets, for instance from the reallocation of existing resources, economies of scale and various labor training effects (Medina-Smith, 2001). On the other hand, a contradictory hypothesize that economic growth leads to the growth of exports is also expressed for some countries, especially nations that are at their early stages of economic development. The growth-driven exports (GDE) hypothesis postulates a reverse relationship. It is based on the idea that economic growth induces trade flows where it can also create comparative advantages in certain areas leading to specialization and facilitating exports (Kónya, 2004).

Many empirical studies have investigated the effect of external debt on economic growth. Focusing on the previous studies, the findings of these studies are mixed. In the study of Ahmed, Butt and Alam (2000), they undertake an examination of the relationship between exports, economic growth and foreign debt for Bangladesh, India, Pakistan Sri Lanka and four South East Asian countries using a trivariate causality framework. The results indicate that there is no evidence of a joint feedback effect between export revenue, external debt servicing and economic growth. Bakar and Hassan (2008) employed Solow's and Romer's models to study the impact of external debts on economic growth in Malaysia and is evidenced that external debt positively affects economic growth. Ayadi and Ayadi (2008) examined the impact external debt, with its servicing requirements on economic growth of the Nigerian and South African economies and found negative impact of debt and its servicing requirement on the economic growth of Nigeria and South Africa. Jayaraman and Lau (2009) focused on the flow of foreign aid in 6 Pacific Island countries over the period of 1988-2004 and assess whether the higher flow of foreign aid and external debt had ever contributed to economic growth in these countries. The results concluded a significantly positive relationship between external debt and real GDP; and an inverse relationship between higher fiscal deficit and GDP growth. Rahman (2012) found that high domestic debt appears to have negative impact on the level of economic growth in the long run. Sulaiman & Azeez (2012) studied the effect of external debt on the economic growth of Nigeria. Their findings revealed that the external debt has contributed positively to the Nigerian economy. Daud, Ahmad and Azman-Saini (2013) investigate the link between debt and economic growth and the findings indicate existence of significant positive relationship between external debt and economic growth in Malaysia. Meanwhile, Abdelhadi (2013) found significant positive relationship between external debt and economic growth. However, with the increasing reliance on foreign funds and loans foreign, this led to rising debt service burdens, which debt servicing and economic growth has a negative relationship in Jordan. Kasidi and Said (2013) analyze

the relationship between external debt and economic growth in Tanzania. Their results reveal there is a negative relationship between external debt and economic growth while there was no impact of debt servicing on economic growth in Tanzania. Azam, Emirullah, Prabhakar and Khan (2013) investigated the impact of external debt on economic growth in Indonesia and they concluded that external debt dampens, whereas, exports boost Indonesian economic growth during the period under the study.

3. DATA AND METHODOLOGY

3.1. Data sources and empirical model

The study is conducted by using the annual time series data of gross domestic product (GDP), external debt as percentage of GDP (ED), exports of goods and services as percentage of GDP (EX) and budget deficit/surplus as percentage of GDP (BD). The data are obtained from *World Development Indicators* (*WDI*), *Economic Planning Unit* (*EPU*), Thailand's *Ministry of Finance* and *Philippines's Bureau of the Treasury*. Due to the certain data availability issues, the times frames are different for the three countries; time series spanning from 1970 to 2012 is utilized for the case in Malaysia; 1980 to 2012 for Thailand; and 1985 to 2012 for the Philippines. For our empirical study, the model is formulated as following:

$$GDP_t = \beta_0 + \beta_1 ED_t + \beta_2 EX_t + \beta_3 BD_t + \varepsilon_t$$

Where GDP: gross domestic product; ED: external debt as percentage of GDP; EX: exports of goods and services as percentage of GDP; and BD: budget deficit/surplus as percentage of GDP.

3.2. Unit root tests

Prior to the cointegration test, the first step is to implement unit root to establish the stationarity properties of the data sets. In this study, we deployed the Augmented Dickey-Fuller (Dickey and Fuller, 1979) unit root test that tests the null of nonstationary. In contrast, we also adopted Kwaitkowski, Phillips, Schmidt and Shin, 1992 procedure where the null being tested is stationary.

3.3. Cointegration procedure

After prompting by the existence of unit roots in the variables, we then adopt Johansen and Juselius (1990, JJ) cointegration test to investigate the existence of the long-run relationship between the variables. It is noteworthy that when two or more variables in a system are found to be cointegrated, it is said to have long-run equilibrium relationship. The test utilized two likelihood ratios (LR) test statistics for the number of cointegration vectors which are the trace test and maximum eigenvalue test respectively. As it become a norm in empirical time series econometrics estimation, the details of JJ test are not presented here but interested reader could refer to the original article for detail implementation.

3.4. Granger causality test

Once cointegration is detected, there always exists a corresponding error correction representation which suggests that changes in the dependent variable are a function of the level of disequilibrium in the cointegrating relationship which is captured by the error correction term (*ECT*), as well as changes in other explanatory variables. Hence, for cointegrated model, the Granger causality must be conducted in vector error correction model (VECM) to test the significance of the error correction term. The existence of a cointegrated relationship in the long-run indicates that the residuals from the cointegration equation can be used as *ECT* as follows:

$$\Delta GDP_t = \delta_0 + \sum_{i=1}^{m} \alpha_1 \Delta GDP_{t-1} + \sum_{i=1}^{n} \alpha_2 \Delta ED_{t-1} + \sum_{i=1}^{o} \alpha_3 EX_{t-1} + \sum_{i=1}^{p} \alpha_4 BD_{t-1} + \mu_1 ECT_{t-1} + \varepsilon_1 \quad (1)$$

$$\Delta ED_t = \omega_0 + \sum_{i=1}^{m} \beta_1 \Delta ED_{t-1} + \sum_{i=1}^{n} \beta_2 \Delta GDP_{t-1} + \sum_{i=1}^{o} \beta_3 \Delta EX_{t-1} + \sum_{i=1}^{p} \beta_4 \Delta BD_{t-1} + \mu_2 ECT_{t-1} + \varepsilon_2 \quad (2)$$

$$\Delta EX_t = \theta_0 + \sum_{i=1}^{m} \phi_1 \Delta EX_{t-1} + \sum_{i=1}^{n} \phi_2 \Delta GDP_{t-1} + \sum_{i=1}^{o} \phi_3 \Delta ED_{t-1} + \sum_{i=1}^{p} \phi_4 \Delta BD_{t-1} + \mu_3 ECT_{t-1} + \varepsilon_3 \quad (3)$$

$$\Delta BD_t = \varphi_0 + \sum_{i=1}^{m} \gamma_1 \Delta BD_{t-1} + \sum_{i=1}^{n} \gamma_2 \Delta GDP_{t-1} + \sum_{i=1}^{o} \gamma_3 \Delta ED_{t-1} + \sum_{i=1}^{p} \gamma_4 \Delta EX_{t-1} + \mu_4 ECT_{t-1} + \varepsilon_4 \quad (4)$$

where, Δ is the lag operator, δ_0, ω_0, θ_0, φ_0, α's, β's, ϕ's, and γ's are the estimated coefficients, *m*, *n*, *o* and *p* are the optimal lags of GDP: gross domestic product; ED: external debt as percentage of GDP; EX: exports of goods and services as percentage of GDP; and BD: budget deficit/surplus as percentage of GDP, ε's are the serially uncorrelated random error terms while μ_1, μ_2, μ_3 and μ_4 measure the single period response of a departure from equilibrium of the dependent variable.

4. EMPIRICAL RESULTS

4.1. Unit root tests results

Prior to the cointegration test, we test for the stationarity properties of the variables. The outcome of suggests that the existence of unit root or nonstationary in level, however, is stationary after first differencing *I*(1). The findings that all the variables have the same order of integration allowed us to proceed with the JJ cointegration test[1].

4.2. Cointegration test results

The results based on Johansen and Juselius's cointegration test suggests that the null hypothesis of no cointegrating vector ($r = 0$) in favor of at least one cointegrating vector is rejected at 5 percent significance level for the case in Malaysia, indicates the presence of one cointegrating vector. Nevertheless, for Thailand and the Philippines, the test results reveal the existence of two cointegrating vectors. Note that both the trace and the maximum eigenvalue test led to the same conclusion. Rejecting the null hypothesis of no cointegration implies that the four variables do not drift apart and

[1] Results for unit root tests are not provided in this paper for brevity but available upon request.

share at least a common stochastic trend in the long-run. The test results are tabulated in Table 1.

Table 1: Johansen and Juselius cointegration test results

Country	Null	Alternative	k = 1 , r = 1			
			Max-Eigen Value		Trace	
			Statistic	95% CV	Statistic	95% CV
Malaysia	r = 0	r = 1	32.751**	32.118	63.963**	63.876
	r ≤ 1	r = 2	16.104	25.823	31.211	42.915
	r ≤ 2	r = 3	11.618	19.387	15.107	25.872
	r ≤ 3	r = 4	3.489	12.518	3.489	12.518
Country	**Null**	**Alternative**	**k = 1 , r = 2**			
			Max-Eigen Value		**Trace**	
			Statistic	**95% CV**	**Statistic**	**95% CV**
Thailand	r = 0	r = 1	45.064**	27.584	82.394**	47.856
	r ≤ 1	r = 2	27.249**	21.132	37.330**	29.797
	r ≤ 2	r = 3	9.373	14.265	10.081	15.495
	r ≤ 3	r = 4	0.709	3.841	0.709	3.841
Country	**Null**	**Alternative**	**k = 1 , r = 2**			
			Max-Eigen Value		**Trace**	
			Statistic	**95% CV**	**Statistic**	**95% CV**
Philippines	r = 0	r = 1	31.612**	27.584	63.826**	47.856
	r ≤ 1	r = 2	26.593**	21.132	32.215**	29.797
	r ≤ 2	r = 3	3.691	14.265	5.622	15.495
	r ≤ 3	r = 4	1.931	3.841	1.931	3.841

Notes: Asterisk ** denotes statistically significant at 5 percent level. The k and r denote the lag length and number of cointegrating vector(s) respectively.

4.3. Causality results

Granted with the long-run relationship, we apply the Granger causality tests within the vector error-correction model (VECM). The causality relationships between the variables are shown in Table 2. The results indicate that, in Malaysia, BD equation is the only one in the system where the ECT is statistically significant; both EX and BD equations for Thailand; and both GDP and BD for the Philippines. This suggests that BD, EX, and GDP solely bears the brunt of short-run adjustment to bring about the long-run equilibrium in Malaysia, Thailand and Philippines, respectively. These variables act as the initial receptor of any exogenous shocks that disturb the equilibrium system. The *t*-statistic on the lagged residual is also statistically significant and negative supporting the JJ results reported earlier. The speed of adjustment for is about 11 percent for Malaysia, 40.8 and 34.4 percent for Thailand while Philippines reports 0.6 and 15.1 percent. The magnitude of these coefficients indicates that the speed of adjustment towards the long-run path varies between three nations. It will take around 9 years for Malaysia and 2.5 and 3 years for Thailand to adjust to the long-run equilibrium due to short-run adjustments. As for Philippines, the error correction coefficients are fairly small which will take about 167 and 7 years to adjust back to the long-run equilibrium.

For the short-run Granger causality analysis, it is evident that there exist causal linkages among the variables for all the three countries under investigation at 5 percent significance level. As presented in Figure 1, gross domestic product and budget deficit/surplus are the cause for EX (GDP → EX and BD → EX) while exports is the cause for external debt (EX → ED) for Malaysia. It is also note that both GDP and BD cause ED and it operates through EX (GDP → EX → ED and BD → EX → ED). On the Thailand's view, there is bilateral relationship between gross domestic product and external debt (GDP ↔ ED); unilateral relationship running from exports to gross domestic product and from gross domestic product to budget deficit/surplus (EX → GDP and GDP → BD). It is also observed that both exports and external debt cause budget deficit/surplus through a causing variable which is gross domestic product (ED → GDP → BD and EX → GDP → BD). Lastly for Philippines, gross domestic product and exports are the cause for budget deficit/surplus (GDP → BD and EX → BD) while budget deficit/surplus causes external debt (BD → ED). It is evident from the results that both gross domestic product and exports cause external debt through a causing variable, budget deficit/surplus (GDP → BD → ED and EX → BD → ED). We also observed that in Malaysia, there is evidence proving the existence of growth-driven exports hypothesis and export-led growth (ELG) hypothesis in Malaysia and Thailand, respectively.

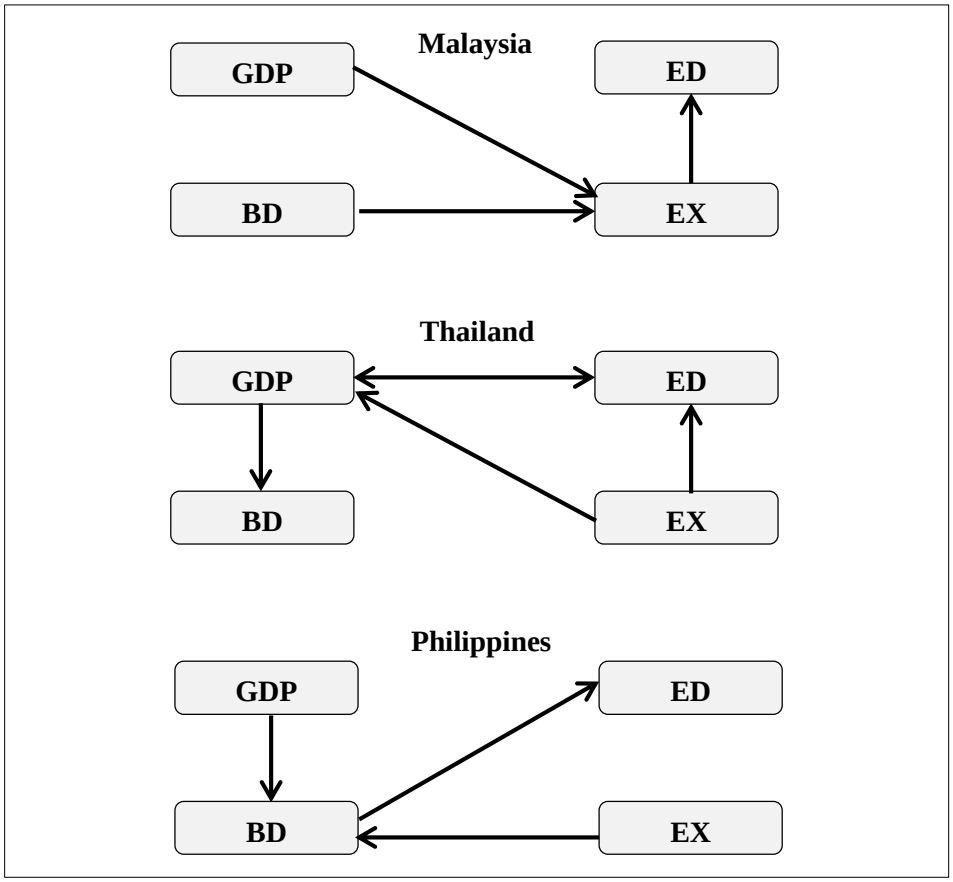
ISBN 978-80-87927-09-0 , IISES

Table 2: Granger Causality results

Dependent variables	∆GDP	∆ED	∆EX	∆BD	ECT	
	χ^2 statistics				Coefficien	*t*-
Panel A: Malaysia						
∆GDP	-	0.000(0.998)	0.104(0.747)	0.465(0.495)	-0.003	-1.519
∆ED	0.409(0.523)	-	5.187(0.023)**	0.398(0.528)	0.308	4.366
∆EX	4.174(0.041)**	0.382(0.536)	-	7.819(0.005)**	0.055	0.713
∆BD	1.401(0.237)	1.319(0.251)	0.801(0.371)	-	-0.110	-3.061**
Panel B: Thailand						
∆GDP	-	7.234(0.007)**	5.576(0.018)**	0.001(0.976)	0.010	1.907
∆ED	20.739(0.000)**	-	5.299(0.021)**	0.165(0.685)	0.105	0.465
∆EX	0.497(0.481)	1.745(0.187)	-	0.168(0.682)	-0.408	-.1972**
∆BD	10.573(0.001)**	0.179(0.673)	1.091(0.296)	-	-0.344	-3.085**
Panel C: Philippines						
∆GDP	-	0.145(0.703)	0.141(0.707)	0.469(0.493)	-0.006	-2.672**
∆ED	0.407(0.524)	-	0.032(0.858)	2.925(0.087)	0.498	4.079
∆EX	0.156(0.693)	0.024(0.877)	-	0.699(0.403)	0.055	0.540
∆BD	5.786(0.016)**	2.170(0.141)	27.370(0.000)**	-	-0.151	-6.546**

Notes: The χ^2 - statistic tests the joint significance of the lagged values of the independent variables, and the significance of the error correction term(s); figures in the parentheses are the *p*-values; ∆ is the first difference operator; ** denotes statistically significant at 5

Figure 1: Summary of short run causal linkages



Notes:→ and ↔ denotes unidirectional and bidirectional causal relationships respectively.

4.4. Further Analysis

All the estimation procedures explained earlier can be interpreted as within-sample estimations which only analyse the variables relationship within the sample period but cannot provide the relative contributions of the explanatory variables in explaining the variation in the dependent variable beyond the sample period (Masih and Masih, 2002). Variance decompositions (VDCs) by partitioning the variance of the forecast error of a certain variable into proportions attributable to innovations or shocks in each variable in the system including its own provide indication of these relativities (Masih and Masih, 2002). Therefore, we relied on VDCs to gauge the strength of the causal relationship among GDP, EX, ED and BD for all the three countries. Sims (1982) explained that a variable that is optimally forecast from its own lagged values will have all its forecast error variance accounted for by its own disturbances.

Table 3 provides the decomposition of the forecast error variances of each variable up to 50 years horizon. It is observed that even after 50 years' time horizon, most of the variance for all the countries is explained by EX rather than other variables in the system; which are 64 percent for Malaysia, 85 percent for Thailand and 87 percent for Philippines, respectively. This suggests that EX is the most exogenous variable in the system for all the three nations. Further, the variance decompositions indicate that ED is the most endogenous variable for both Malaysia and Thailand while BD is the most endogenous variable for the case in Philippines; as the forecast error variance

explained are the smallest in the system at the end of the 50-years' time horizon. The findings in the VDCs is noteworthy as it is found to be consistent with the results obtained in VECM earlier where ED is largely influenced by GDP and BD in the case of Malaysia, whereas BD is influenced mostly by GDP in Thailand ascertain that GDP is the cause for BD in VECM. Besides that, BD is the most endogenous variable in the Philippines and this result is in accordance with the results obtained from VECM as BD react as the receptor that capture the exogenous shocks from GDP and EX in VECM.

Table 3: Variance Decompositions (VDCs)

Horizon (Years)	Due to innovation in: ∆BD	∆ED	∆EX	∆GDP
		Malaysia		
1	100.000	85.088	96.260	37.399
4	72.040	57.612	71.464	47.449
8	51.729	27.325	67.319	51.212
24	37.179	12.135	64.657	54.308
32	35.046	10.448	64.318	54.752
40	33.731	9.455	64.113	55.026
50	32.659	8.671	63.949	55.248
		Thailand		
1	100.000	93.097	96.544	38.731
4	75.481	33.074	89.524	36.813
8	78.318	7.547	80.021	30.836
24	76.899	2.707	82.187	30.133
32	76.869	2.050	83.043	30.037
40	76.864	1.726	84.165	30.397
50	76.879	1.407	84.910	30.510
		Philippines		
1	76.950	99.716	100.000	33.153
4	22.956	30.386	94.544	28.078
8	7.982	11.559	90.518	25.105
24	2.291	8.129	87.562	25.113
32	1.766	7.868	87.211	25.127
40	1.466	7.721	87.003	25.135
50	1.233	7.610	86.837	25.142

5. SUMMARY AND CONCLUSION

Utilizing a set of time series data of gross domestic product (GDP), external debt (ED), exports of goods and services (EX) and budget deficit/surplus (BD), this study aims to examine the causal relationship between external debt and economic growth in Malaysia, Thailand and the Philippines. By employing the cointegration test, the results reveal that the existence of long-run relationship between economic growth, external debt, exports of goods and services and budget deficit/surplus in all the nations. Focusing on the causal linkages between external debt and growth, the empirical study findings suggest that the burden of short run adjustment appears to have fallen mostly on economic growth (GDP), where the results implied GDP is the cause for exports (EX), external debt (ED) and budget deficit/surplus (BD) for Malaysia, Thailand and the Philippines. In addition, both growth driven exports and export-led growth hypothesis are observed for Malaysia and Thailand, respectively and growth-driven debt hypothesis for Malaysia, Thailand and the Philippines. The dynamic analysis based on

the variance decomposition reveals that the most exogenous variable in Malaysia is exports of goods and services (EX) while external debt (ED) is the most endogenous variable. On the other hand, the most endogenous variable is external debt (ED) while exports of goods and services (EX) is the most exogenous variable in Thailand. As for Philippines, the most endogenous variable is budget surplus/deficit (BD) and exports of goods and services (EX) is the most exogenous variable among the four variables.

Since the results substantiate that the accumulation of external debt is associated with the economic growth in all the nations in this study, the policymakers play a significant role in monitoring the external debt position to avoid the risk of being trapped in the debt overhang situation. As a whole, the policymakers should launch programs which aim to govern the stability and sustainability of the public funds and also to strengthen the government's finances. Furthermore, it is proven that an increasing BD will adversely affect the external debt, it is suggested that the policymakers cannot ignore the growing size of BD and should implement fiscal policies and budget management to manage the government expenditure and revenues.

Lastly, further research in this area can be carried out by analyzing the impact of debt composition on economic growth as debt may have varying effects on economic growth. Besides that, future research can be undertaken by including more macroeconomic variables such as interest rate, real interest rate, inflation rate etc. to examine the effect towards the economic growth.

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