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EXTERNAL SHOCKS IN EMERGING MARKETS: THE CASE OF MALAYSIA

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ABSTRACT

Global integration has resulted in numerous benefits, including increased trade, investment, and economic growth. Meanwhile, integration can make countries more vulnerable to external shocks, such as commodity price fluctuations, or economic and financial crises. These have the potential to significantly affect economic activity. Thus, the present paper investigates the impact of external shock in Malaysia using the open economy SVAR model. The findings discovered that external shocks cause inflationary pressures in the domestic economy. Domestic monetary policy seems to be tightening to reduce inflationary pressures. Shocks in oil prices and foreign monetary policy cause a decrease in the government debt ratio, demonstrating that both external variables have a significant impact on the domestic debt ratio. External shocks, particularly oil prices and foreign income shocks stimulate output and improve the primary deficit. The findings indicate that external shocks have a significant impact on the Malaysian economy.

Keywords: External shocks, Malaysia and SVAR model

ABSTRAK

Integrasi global dapat menghasilkan kepelbagaian manfaat, termasuklah peningkatan perdagangan, pelaburan dan pertumbuhan ekonomi. Sementara itu, integrasi boleh menjadikan negara lebih terdedah kepada kejutan luaran, seperti turun naik harga komoditi mahupun krisis ekonomi dan kewangan. Hal ini berpotensi menjejaskan aktiviti ekonomi dengan signifikan. Oleh sebab itu, kajian ini merungkaikan kesan kejutan luaran di Malaysia menggunakan model ekonomi terbuka SVAR. Hasil dapatan mendapati bahawa kejutan luaran menyebabkan tekanan inflasi dalam ekonomi domestik. Dasar monetari domestik dilihat semakin mengetat bagi mengurangkan tekanan inflasi. Kejutan dalam harga minyak dan dasar monetari asing menyebabkan penurunan nisbah hutang kerajaan, menunjukkan bahawa kedua-dua permboleh ubah luaran memberi kesan signifikan kepada nisbah hutang domestik. Kejutan luaran, terutamanya kejutan harga minyak dan pendapatan asing merangsang output dan memperbaiki primer defisit. Hasil dapatan menunjukkan bahawa kejutan luaran mempunyai kesan signifikan terhadap

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ekonomi Malaysia.

Kata kunci: Kejutan luaran, Malaysia dan Model SVAR

1. Introduction

Malaysia is widely regarded as a small open economy, where the country depends heavily on international trade and investment and is largely influenced by global economic conditions. Being a small open economy, Malaysia is vulnerable to external shocks such as changes in global commodity prices, fluctuations in exchange rates, or changes in demand for its exports (Zaidi & Karim, 2014; Zaidi *et al*. 2018). For example, the global financial crisis of 2008 resulted in a significant drop in global demand for Malaysian exports, negatively impacting the country's economic growth. Malaysia's GDP growth rate decreased from 6.3 per cent in 2007 to just 3.1 per cent in 2009. The unemployment rate rose from 3.7 per cent in 2008 to 4.7 per cent in 2009 and peaked at 5.3 per cent in 2010. Furthermore, the crisis had a significant impact on Malaysian inflation. Food and fuel price increases, combined with a weakening Malaysian ringgit, contributed to a rise in the consumer price index (CPI) from 2.8 per cent in 2008 to 5.4per cent in 2009 (BNM, 2010).

The recent economic crisis caused by the COVID-19 pandemic has adversely affected global demand, as countries around the world have been forced to implement lockdowns and social distancing measures to contain the virus's spread (IMF, 2020) Malaysia's economy has been significantly impacted by the decline in global demand. Due to the pandemic's disruption of global supply chains, demand for Malaysian exports has significantly decreased, particularly in the manufacturing and electronics sectors. As a result, many businesses have been forced to reduce their operations or close, significantly reducing economic activity.

In 2020, Malaysia's GDP contracted by 5.6 per cent, the lowest level since the Asian financial crisis in 1998. This represented a significant reversal from the country's 4.3 per cent growth in 2019. The decline in global demand also affected Malaysia's unemployment rate, which forced many companies to reduce staff or lay off workers. This has resulted in a decrease in consumer spending, which has further reduced demand for goods and services. Bank Negara Malaysia (2020) reported that the unemployment rate increased from 3.2 per cent in 2020: Q1 to 5.3 per cent in 2020: Q3, a significant increase that can be attributed to the COVID-19 pandemic.

Thus, this paper seeks to address the importance of external shocks to Malaysia's economy using the open economy SVAR model. While this study is important because it can help policymakers better understand the vulnerabilities and risks that Malaysia's economy faces. Understanding the impact of external shocks on Malaysia's economy allows policymakers to design more effective policies and measures for mitigating the effects of economic downturns and promoting long-term economic growth and sustainability. If an external shock significantly affects the domestic economy, policymakers can take steps to reduce the economy's reliance on external factors by encouraging greater economic diversification. For example, the government could invest in developing new industries, encouraging innovation, and encouraging entrepreneurship to create new sources of economic growth that are less dependent on global trends.

This study is divided into five sections. The second section explores the relevant literature. The methodology is presented in the third section. The fourth section explains the results of the impulse response, and the fifth section discusses the conclusion.

2. Literature Review

The economic dependency theory can be used to explain the effects of external shocks on domestic economic activities. Santos (1970) defines dependence as a situation in which one country's economy is conditioned by the development and expansion of another economy to which the former is subject. Thus, the expansion of some countries (the dominant ones) can have an impact on the immediate development of other countries (the dependent ones), either positively or negatively (Santos, 1970). As the world becomes more interconnected and interdependent, countries become more vulnerable to external shocks that can have significant effects on their economies. Previous studies, for instance, Cushman and Zha (1997) discovered that external shock significantly affects domestic variables in Canada. Foreign income shock, in particular, causes inflationary pressure, a reduction in output and money supply, and a depreciation of the domestic currency.

According to Buckle *et al.* (2007), business cycle fluctuations in New Zealand have primarily been caused by external shocks, particularly international trade prices. Similarly, Dungey and Fry (2009) discovered that most of the behaviour in New Zealand output is greatly influenced by internationally sourced shocks. Cavalcanti and Jalles (2013) claimed that external shocks, particularly oil price shocks, intensify wage pressures (lowering employment) and cause the exchange rate to appreciate, reducing competitiveness through worsening terms of trade. Recently, Wen *et al*. (2021) discovered that external shocks, such as oil price shocks, have a significant impact on G7 inflation.

The idea that external shocks are important for developing countries stems from the empirical work of Calvo *et al*. (1993). The authors argued that the state of the US economy has an impact on Latin America. A drop in interest rates, for example, has encouraged investors to shift resources to Latin America. Allegret *et al*. (2012) believed that movements in domestic output in developing Asian countries were caused by external shocks, specifically global oil prices, and the US output shocks. Similarly, Sato *et al.* (2011) discovered that world oil prices and the US output shocks became more significant in influencing Asian domestic output after the global financial crisis. In contrast, however, Raddatz (2007) asserted that low-income countries' economic instability is largely the result of internal factors rather than external shocks. Recently, Neaime and Gaysset (2022) discovered that the macroeconomic fundamentals of the Middle East and North Africa (MENA) seem to be significantly impacted by external shocks.

For developing countries like Malaysia, Zaidi and Fisher (2010) discovered that foreign variables have the largest influence on Malaysia's macroeconomic performance. Karim and Karim (2014) discovered that external shocks, specifically oil prices and foreign income shocks, significantly affect domestic output growth. Similarly, Lee (2022) recently pointed out that external shocks play a dominant role in affecting the Malaysian economy, particularly inflation, interest rate, and budget balance. However, previous studies conducted by Zaidi and Fisher (2010) and Karim and Karim (2014) ignore fiscal policy variables in their SVAR model. As stated by Parkin (2019), both monetary and fiscal policy can have an impact on aggregate demand. According to Tan *et al.* (2020), since the interaction between monetary and fiscal policies has a significant impact on economic growth, it is essential to include both policies in a single model. Thus, we improved their studies by incorporating fiscal policy variables into the SVAR model.

3. Methodology

3.1 Description of data and variables

The impact of external shock on the Malaysian economy was investigated using quarterly data from 1991:1 to 2021:4. The variables were divided into foreign and domestic variables. Foreign variables include world oil prices, foreign income, and foreign interest rates. World oil price proxies by real crude oil imported acquisition cost as suggested by Alquist *et al.* (2013). Foreign income proxies by the US real

GDP and federal fund, rates are used to represent foreign interest rates. This study selects the US as a country because it is one of Malaysia's major trading partners. Malaysia's total export to the United States accounted for 43 per cent of total products from 1990 to 2019 (WITS, 2019).

The domestic variables include real GDP, inflation, government debt, primary deficit, and interest rates. The Consumer Price Index (CPI) is used to measure the inflation rate. Its percentage change from quarter to quarter is used. Internal and external debts combine to form government debt and are expressed as a percentage of GDP. The primary deficit is defined as the total revenues minus non-interest expenditures, which is total expenditure minus interest payments, expressed as a percentage of GDP. The primary deficit is used to represent fiscal policy stance as it helps in assessing the impact of discretionary policy and automatic stabilisers (Mahmah & Kandil, 2018). To represent the monetary policy stance, the interbank overnight rate (IBOR) is used as the domestic interest rate. Previous studies like Domac (1999), Ibrahim (2005), Umezaki (2007), Karim and Karim (2014), and Raghavan and Athanasopoulos (2018) have used IBOR as a monetary policy stance.

All the variables are seasonally adjusted using the Census-X12, except the U.S. Real GDP which is available after seasonal adjustment. Except for the primary deficit ratio, inflation rate, and interest rates, all variables transform into logarithms. In addition, we included two dummies to represent Malaysian economic events: the 1997-98 Asian Financial Crisis (1997: Q3-1998Q4), and the 2008 Global Financial Crisis (2007: Q3-2009: Q1).

3.2 Econometric framework

We employed a structural vector autoregressive (SVAR) model in examining the impact of external shock on the domestic economy. The SVAR model has the advantage of capturing the key characteristics of a small open economy (Cushman & Zha, 1997). A benchmark SVAR model is shown below:

$$\mathrm{B}y_t = \mathrm{v} + \mathrm{C(L)}y_{t-p} + \varepsilon_t \qquad (1)$$

where B is an invertible square matrix of coefficients that describes the simultaneous structural relationship between variables, y_t is (n x 1) vector of endogenous variables, v is (n X 1) a vector of deterministic variables (constants and dummy variables), $\mathrm{C(L)}$ is (n X n) square matrix polynomial in the lag operator L, and ε_t is (n x 1) vector of structural error that satisfies the conditions $E(\varepsilon_t) = 0$ and $E(\varepsilon_t \varepsilon_t') = I_n$ is $n \times n$ of the identity matrix.

Equation (1) cannot be directly estimated to determine the true value of B, $\mathrm{C(L)}$ and ε_t because there is a lag effect for the dependent variable. This problem, however, can be solved by transforming equation (1) to the reduced form representation shown below:

$$y_t = B^{-1}v + B^{-1}\left(C_1 L + C_1 L^2 + \cdots + C_k L^k\right)y_t + B^{-1}\varepsilon_t$$

or

$$y_t = \prod_0 + \prod_1 y_t + \mu_t \qquad (2)$$

where $\prod_0 = B^{-1}v$, $\prod_1 y_t = B^{-1}\left(C_1 L + C_1 L^2 + \cdots + C_k L^k\right)y_t$ and $\mu_t = B^{-1}\varepsilon_t$.

In equation (2), μ_t is a residual reduced form that meets the conditions $E(\mu_t) = 0$ and $E(\mu_t \mu_t') = \sum_\mu$ is a positive and symmetric matrix that can be estimated from the data. Given that the residual reduced-form (μ_t) and the structural error (ε_t) have a relationship $\mu_t = B^{-1}\varepsilon_t$ or $B\mu_t = \varepsilon_t$, the variance-covariance matrix to capture this relationship as follows:

$$E(\mu_t\mu_t') = B^{-1}\varepsilon_t B^{-1\prime}\varepsilon_t{}'$$
$$= B^{-1}E(\varepsilon_t\varepsilon_t')B^{-1\prime}$$
$$= B^{-1}\sum_{\varepsilon}B^{-1\prime}$$
$$\sum_{\mu} = B^{-1}B^{-1\prime} \quad (3)$$

The variance-covariance matrix($\sum_{\mu}$) has $n(n+1)/2$ different elements. However, matrix B contains n^2 parameters, which exceed the maximum number of parameters required by the SVAR system. According to Lutkepohl and Kratzig (2004), the order condition is a standard criterion for resolving SVAR system identification problems. The order condition stated that the zero restrictions on matrix B must be determined which is subject to $(n^2-n)/2$ restrictions. After addressing the identification problem, the SVAR model can be estimated using maximum likelihood.

In the pure recursive VAR model, all the elements above the diagonal of matrix B are set equal to zero. This study, however, imposes alternative restrictions on the contemporaneous parameters of the SVAR model based on theories and past studies. In the matrix form, the restriction for matrix B is shown in Equation (4).

$$B\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \alpha_{21} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ \alpha_{31} & \alpha_{32} & 1 & 0 & 0 & 0 & 0 & 0 \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & 1 & 0 & 0 & 0 & 0 \\ \alpha_{51} & \alpha_{52} & \alpha_{53} & \alpha_{54} & 1 & \alpha_{56} & \alpha_{57} & 0 \\ \alpha_{61} & \alpha_{62} & \alpha_{63} & \alpha_{64} & 0 & 1 & 0 & 0 \\ \alpha_{71} & 0 & 0 & \alpha_{74} & 0 & \alpha_{76} & 1 & 0 \\ \alpha_{81} & 0 & \alpha_{83} & \alpha_{84} & \alpha_{85} & 0 & 0 & 1 \end{bmatrix}\begin{bmatrix} \mu_{LOP_t} \\ \mu_{LYUS_t} \\ \mu_{FFR_t} \\ \mu_{LYM_t} \\ \mu_{INF_t} \\ \mu_{PD_t} \\ \mu_{GD_t} \\ \mu_{R_t} \end{bmatrix} = \begin{bmatrix} \varepsilon_{LOP_t} \\ \varepsilon_{LYUS_t} \\ \varepsilon_{FFR_t} \\ \varepsilon_{LYM_t} \\ \varepsilon_{INF_t} \\ \varepsilon_{PD_t} \\ \varepsilon_{GD_t} \\ \varepsilon_{R_t} \end{bmatrix} \quad (4)$$

Equation (4) imposes 33 zero restrictions, which exceeds the 28 zero restrictions for the system to be just identified or exactly identified. In other words, the SVAR model is over-identified. The likelihood ratio (LR) test will validate the additional restrictions in the model (Enders, 2015). The LR test statistic is as follows:

$$LR = T(logdet(\sum_e^r) - logdet(\sum_e)) \quad (5)$$

Where $(\sum_e^r)$a corresponding estimator is derived from restricted structural form estimation, and $(\sum_e)$ is the ML estimator of the reduced form model. This statistic has a Chi-square distribution with degrees of freedom equal to the number of over-identifying restrictions.

3.3 Identification scheme

Table 1 contains information on the model contemporaneous and lag structure. In this study, foreign variables are regarded as fully exogenous and do not respond immediately or with a lag of domestic variables. This is justifiable as Malaysia has a small size of the economy (Zaidi & Fisher, 2010), thus domestic variables are assumed to have no impact on foreign variables. This assumption is important for analysing the impact of external shock on domestic variables. Previous empirical studies have made a similar assumption such as those conducted by Cushman and Zha (1997), Brischetto and Voss (1999), Kim and Roubini (2000), and Zaidi *et al*. (2016).

Except for the government debt ratio and domestic interest rate, it is assumed that all foreign variables affect domestic variables instantly and with a lag. Government debt, in particular, only reacts to world oil

prices contemporaneously and with a lag, whereas domestic interest rates only react to world oil prices and foreign interest rates simultaneously and with a lag. The assumption is that government debt only reacts to oil prices because higher oil prices accelerate the rise of government tax revenues, resulting in extra revenue that can be used to cover government debt.

Domestic interest rates do not react immediately to movements in foreign income because the BNM will not consider the shock of the U.S. output when determining price level stability (Zaidi *et al*., 2016). In SVAR models, this identification assumption has been applied frequently such as those of Kim & Roubini (2000) in G7 countries, and Berkelmans (2005) in Australia.

Table 1: Contemporaneous and lag structure of the model

		Independent variables							
		LOP	LYUS	FFR	LYM	INF	PD	GD	R
Dependent variables	LOP	*	*	*					
	LYUS	*	*	*					
	FFR	*	*	*					
	LYM	*	*	*	*	*	*	*	*
	INF	*	*	*	*	*	*	*	*
	PD	*	*	*	*	*	*	*	*
	GD	*	*	*	*	*	*	*	*
	R	*	*	*	*	*	*	*	*

Note: LOP=world oil price, LYUS=Foreign income, FFR=foreign interest rate, LYM=domestic income, INF=inflation, PD=primary deficit, GD=government debt, R= interest rate. Shaded cells indicate contemporaneous relationships and * indicates lag relationships.
Source: Authors' own

4. Results

First, the stationarity for each variable was determined using Augmented Dickey-Fuller (ADF) tests. Table 2 provided the ADF test results. The tests show that inflation and government debt ratio are stationary in level whereas other variables are stationary at first differences. Thus, the important question arises whether the variables in the VAR model should be used in level or first differences. Sims (1980) urged that variables in model VAR be in level, although the variables have a unit root. Since unit root does not affect the distribution of an estimator, which is more important in estimation, it is unnecessary to transform the differenced-stationary variable by differencing (Sims et al., 1990). Furthermore, a VAR model at the level can be estimated even if the variables have unit roots, thus potential cointegration restrictions are neglected. This is frequently done in SVAR modelling to avoid putting too many restrictions (Lutkepohl & Kratzig, 2004). Therefore, this study specified the SVAR model in levels following their recommendation. Previous empirical studies estimated a VAR in levels even though the model contains unit root series (Sims, 1992; Kim and Roubini, 2000; Zaidi *et al*. 2016; Hong, 2016; Nguyen *et al*. 2019).

Table 2: ADF Tests

Variables	Level		First difference	
	Constant	Constant & trend	Constant	Constant & trend
LOP	-1.8321(0)	-2.3313(0)	-11.0051(0)*	-10.9601(0)*
LYUS	-1.6943(0)	-2.0037(0)	-12.7776(0)*	-12.9470(0)*
FFR	-1.6798(4)	-3.0943(4)	-5.2445(3)*	-5.2180(3)*
LYM	-1.3347(0)	-2.5065(0)	-10.8915(0)*	-10.9913(0)*
INF	-9.7850(0)*	-10.2642(0)*	-9.1054(4)*	-9.0870(4)*
PD	-1.8570(8)	-1.7656(8)	-5.1871(7)*	-5.2301(7)*
GD	-1.7450(8)	-3.4559(8)**	-2.1639(7)	-2.4391(7)
R	-2.2542(1)	-3.0284(1)	-7.2001(0)*	-7.1726(0)*

Note: (*) indicates significance at the 1per cent level, (**) significance at the 5per cent level, and (***) significance at the 10per cent level. For the constants, the τ (tau) -statistic values were -3.49, -2.88, and -2.58 for the 1per cent, 5per cent, and 10per cent significance levels, respectively. The τ (tau) -statistic values for constants with time trends were 4.04, 3.45, and 3.15 for significance levels of 1per cent, 5per cent, and 10per cent, respectively. Figures in parentheses () show the optimal lag determined by the Schwarz Info Criterion (SIC).
Source: Authors' own

Table 3 shows the recommended lag lengths based on various criteria. According to the results, AIC and HQ recommend two lags, whereas SBC recommends one. When the autocorrelation LM test results are considered, only lag 1 fails to reject the null hypothesis of autocorrelation, except lags 2,3, and 4. As such result, we chose a lag order of 2 because it has been widely used for quarterly data. With a lag order of 2, the inverse roots of the AR characteristic polynomial fall inside the unit circle, implying that the VAR (2) is stable, and the system process is stationary (Lütkepohl, 2005).

Given that the SVAR model overidentifies, the likelihood ratio (LR) statistic will support the model's restrictions. The outcome demonstrates that the value of the Chi-squared test is 2.61, and the prob-value is 0.11. Thus, the overidentifying restrictions of the SVAR model are confirmed to be valid.

Table 3: Lag length selection criteria

K	AIC	SBC	HQ
4	3278.8303	3813.4043	3376.3580
3	3229.5779	3681.1474	3350.0517
2	3150.9575*	3484.7781	3259.6331*
1	3224.2828	3413.1310*	3293.9366

Note: * indicates the optimal number of lags based on various criteria.
Source: Authors' own

4.1 Impulse response function (IRF)

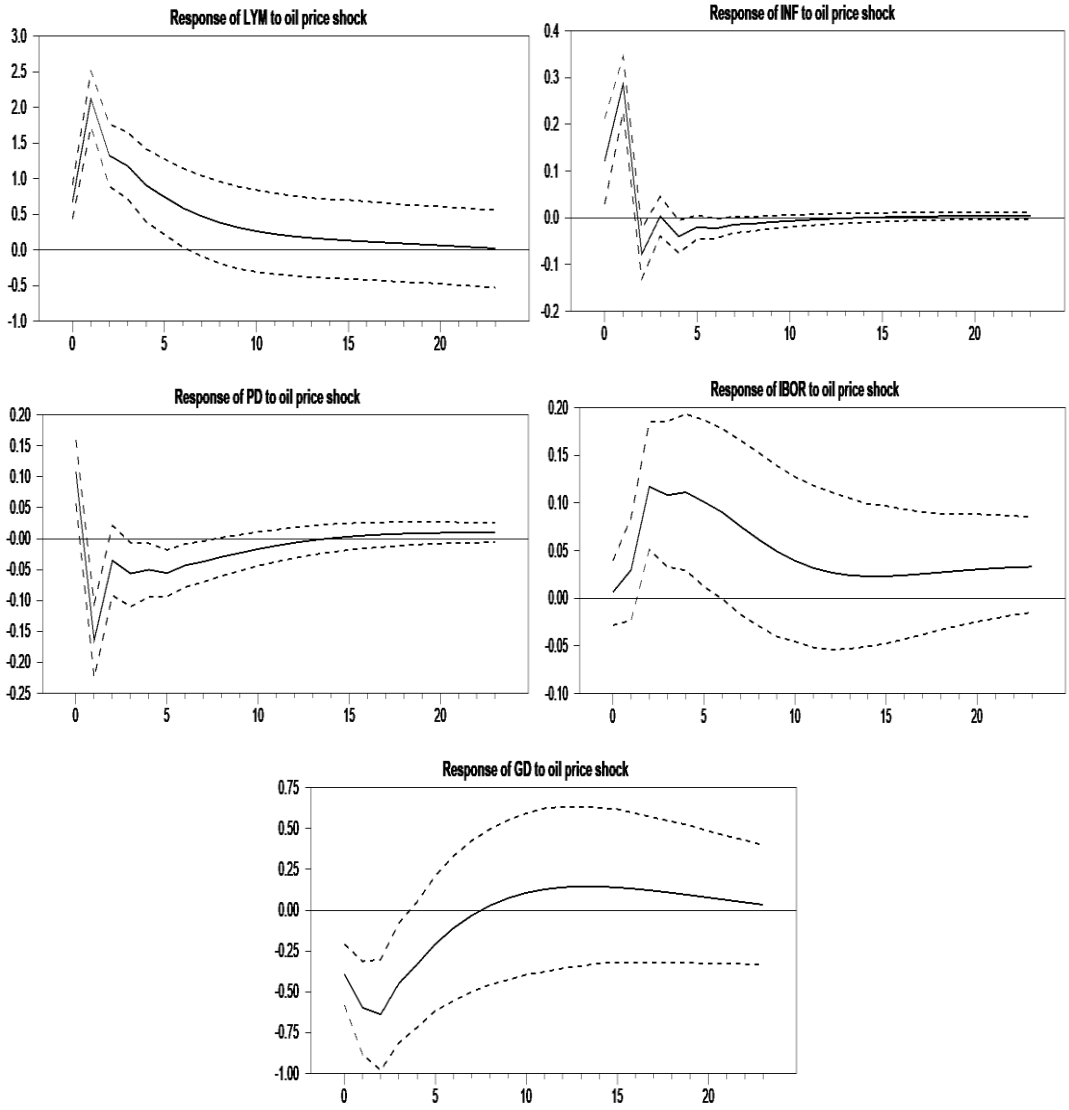
Figures 1, 2, and 3 show the impulse response functions of domestic variables to a shock (measured by a one standard deviation increase) in world oil prices, foreign income, and foreign monetary policy, respectively. The two dashed lines show confidence intervals, and the solid line shows estimated responses. The confidence interval was generated using the bootstrap method with a confidence level of 68per cent and 2500 bootstrap repetitions from the original sample data.

Figure 1 depicts the impact of the oil price shock, which represents one standard deviation increase in oil prices. Initially, a rise in oil prices causes an increase in domestic output. In particular, output rises and peaks in the first quarter before falling back to the point of convergence in the twentieth quarter. However, the impact is significant from the first to the sixth quarters. This result is expected as Malaysia is an oil producer. Consequently, the Malaysian economy is benefited from the rise in oil prices. This finding is in line with the previous study by Karim and Karim (2014). The response to inflation was also anticipated. The inflation rate rises initially, peaks in the first quarter, and falls in the third quarter. This confirms the inflationary impact of oil prices on the Malaysian economy. Prior studies also support the inflationary effect of oil price shock are Chang and Wong (2003) for Singapore, (Cologni & Manera, 2008) for some G-7 countries, Basnet and Upadhyaya (2015) for ASEAN countries, and Zakaria *et al*. (2021) for South Asian countries.

We assert that the decline in inflation in the third quarter is due to the rise in interest rates caused by the oil price shock. Interest rates raise initially, peak in the second quarter, and remain positive for the remainder of the quarter. However, the response of interest rates was significant from the second to the fifth quarter. Thus, this result confirms that Malaysia's central bank tightened its monetary policy in

response to the oil price shock to reduce inflationary pressure. Following an oil price shock, the primary deficit appears to respond negatively in the first quarter before returning to the convergence point in the thirteenth quarter. However, the effect was only significant from the first to sixth quarters. This outcome is expected because rising oil prices increase government tax revenue. As a result, it reduces Malaysia's primary deficit.

Following an oil price shock, government debt suffers a negative reaction. Government debt falls initially, reaching its lowest point in the second quarter before returning to the convergence point at the end of the seventh quarter. The effect, however, is only significant until the fourth quarter. We believe that as the primary deficit improves and output rises as a result of the oil price shock, government debt will fall. According to Carlin and Soskice (2006), an increase in GDP reduces government debt.



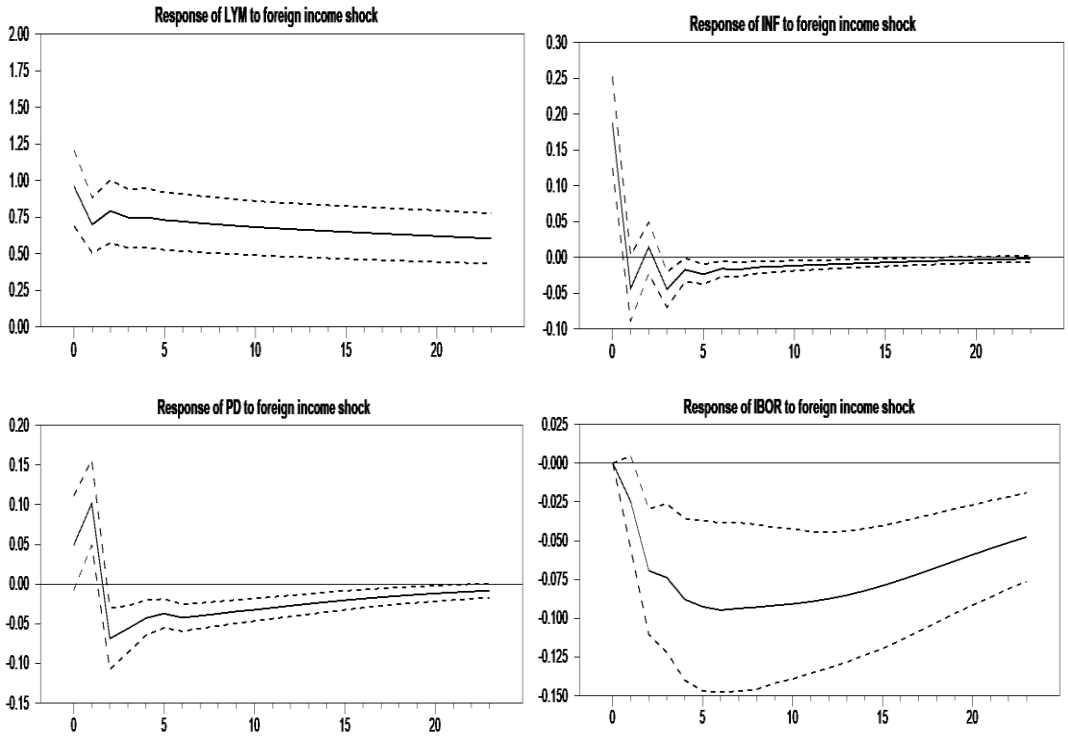
Source: Authors' own

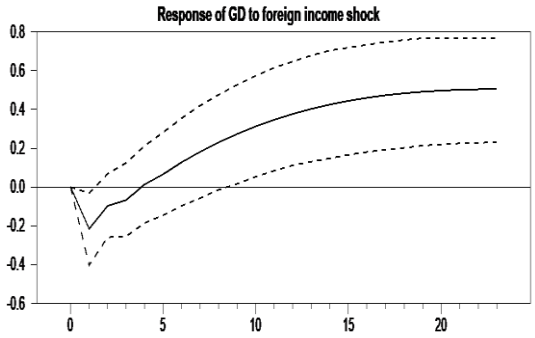
Figure 1: Responses of domestic variables to the oil price shock

Figure 2 depicts the impact of a foreign income shock, which is represented by a one standard deviation

increase in the US real GDP. Domestic output rises for the entire quarter as a result of the foreign income shock. The outcome expected as the US economy expands stimulates trade activities and ultimately raises national output. Therefore, we argue that Malaysia's economy benefits from the expansion of the US economy. Moreover, we assert that domestic output stays positive throughout the period because the central bank implements an expansionary monetary policy in response to foreign income shocks. The interest rate response appears to be negative for entire quarters. According to economic theory, a reduction in interest rates can thus increase aggregate demand and output.

The response to inflation is positive following foreign income shock. This result confirms that foreign income shock causes inflationary pressure on Malaysia's economy. However, the inflationary pressure was only short-lived as the inflation rate respond negatively after the third quarter and remains low for the entire period. The significant effect was found only from the third quarter until nineteenth quarter. Primary deficit responds negatively after the first quarter, reaches its lowest point in the third quarter, and remains negative for an entire quarter. This response is significant, stating that improvement in the US economy improves the primary deficit in Malaysia. We contend that this happens due to improvements in the Malaysian economy that caused raises in the government tax revenue. Government debt responds negatively in the first quarter and significantly following foreign income shock. Although domestic output rises after a shock to foreign income, it cannot reduce the government's debt; rather, it becomes significant and positive from the ninth quarter through the entire period. Thus, this result demonstrates that foreign income shocks only have a short-term negative impact on government debt.

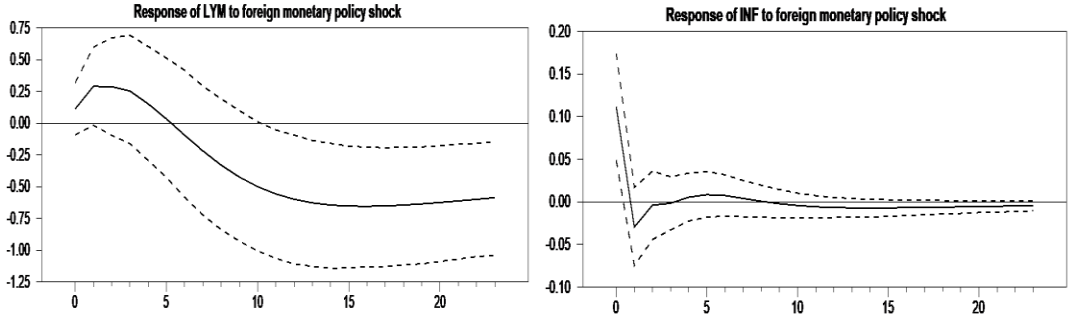




Source: Authors' own

Figure 2: Responses of domestic variables to the foreign income shock

Figure 3 depicts the impact of a foreign monetary shock, which is represented by a one-standard-deviation increase in the FFR. Foreign monetary shocks significantly reduce domestic output. However, it started to decline after the tenth quarter and continued through the entire period. Thus, it appears that the effect of a foreign monetary shock causes output to fall with a lag. Following a foreign monetary shock, inflation responds positively and significantly, confirming inflationary pressure. The primary deficit responds positively, reaching its peak in the first quarter before reverting to the convergent point in the seventh quarter. Following a foreign monetary policy shock, domestic interest rates respond positively. This finding is in line with the prior study by Karim and Karim (2014). According to Karim and Karim (2014), the US's tightening monetary policy is causing the domestic monetary authority to be concerned about capital transfers to the US. The BNM must therefore act in response by raising domestic interest rates to ensure that portfolio investment in Malaysia is competitive. Following a foreign monetary shock, government debt reacts negatively and significantly. The effect is significant until the eleventh quarter. Thus, we contend that an expansionary foreign monetary policy can reduce Malaysia's government debt ratio.



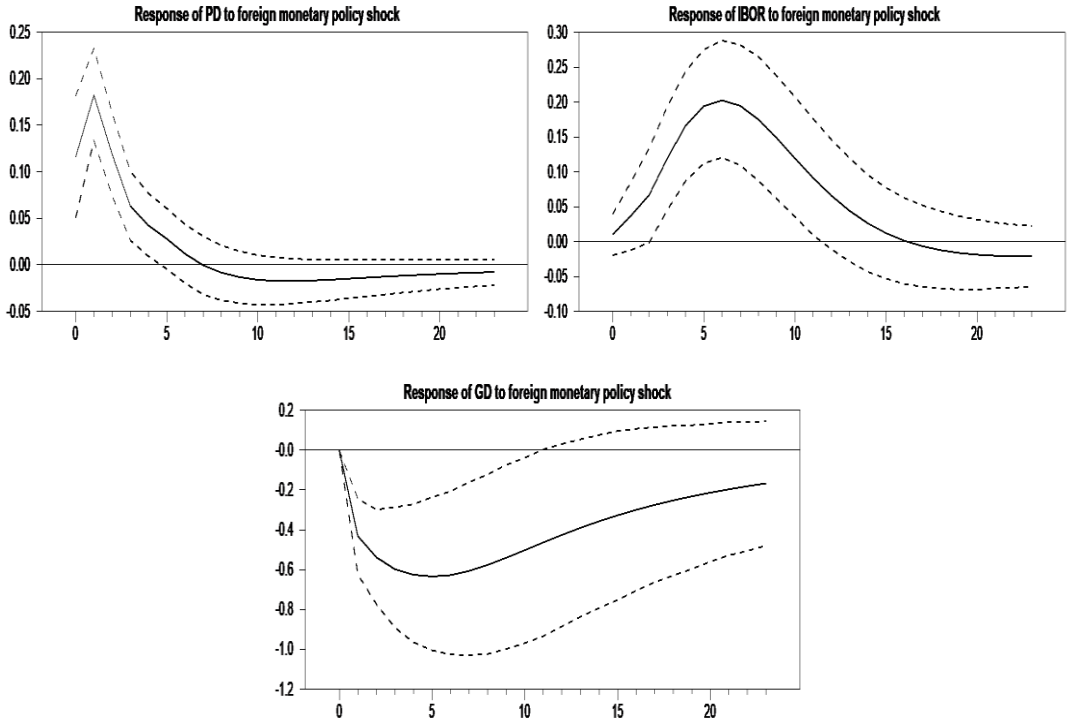


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Figure 3: Responses of domestic variables to the foreign monetary policy shock

5. Conclusion

The impact of external shocks on the Malaysian economy was investigated using an open economy SVAR model. The impulse response functions indicate that external shocks have a significant impact on the Malaysian economy. In particular, external shocks cause inflationary pressure on the domestic economy. Moreover, shocks from oil prices and foreign income induce Malaysia's economy to expand. The primary deficit appears to be improving as a result of external shocks, particularly the oil price and foreign income shock. Oil prices and foreign monetary shocks cause a reduction in the government debt ratio. Following an oil price and foreign monetary shock, Malaysia's monetary authority appears to respond by tightening its monetary policy.

The findings have several important implications for the government. First, since external shocks cause inflationary pressures in the domestic economy, the government is advised to create a more competitive market. Such measures can encourage firms to innovate and find ways to reduce costs, resulting in lower prices and higher productivity. Furthermore, the government can invest in infrastructure to improve transportation and logistics systems to support trade, which can lower transportation costs and help lower consumer prices. Second, since external shock can improve the primary deficit, policymakers must consider the appropriate course of action to maintain fiscal stability while also responding to the shock. One approach is to use the improved primary deficit to pay down outstanding debt, which can reduce the government's interest payments over the long term and provide more room for fiscal maneuvering in the future. Another option is to invest in infrastructure or other productive assets that can support economic growth and increase the government's revenue in the long run.

Third, since external shocks lead to the tightening of monetary policy, the government may consider implementing structural reforms to reduce the economy's vulnerability to external shocks. This could

involve labour market reforms, investments in education and training, and improvements to the business environment to increase the economy's flexibility and competitiveness.

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