MONETARY AND FISCAL POLICIES VARIABLES INTERACTION WITH STOCK RETURNS IN MALAYSIA

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ABSTRACT: *The effect of monetary and fiscal policy shocks is examined though a structural VAR model in Malaysia. The innovation of this study is that, effects of monetary and fiscal policies are investigated simultaneously in addition with house price variable. Moreover, international oil prices and gold prices also included in the SVAR model because it is supposed that concurrent developments in oil and gold prices have crucial influence over macroeconomic activities that are very closely linked with stock returns. The study has filled the void by creating a unique combination of these variables in the model that are currently interacting with stock market performance. The results of the study suggests that oil prices influenced positively to stock returns while gold is used as hedge against the stocks. House market influenced by stock wealth, but there is no proof about credit effect on stock returns. The study could not find contemporaneous positive change by expansion in government expenditures and similar short-term interest rate is also ineffective to determine the stock returns. Interaction between exchange rate and stock returns are showing support in the favour of portfolio model. This study would add instant information to enhance the understanding of government macroeconomic policy makers vis-a-vis the prospective and existing investors. In future, investors and policy makers should contemplate the impact of monetary and fiscal policies jointly rather than separately.*

1. INTRODUCTION

In these modern ages, each economy is contemporaneously striking by different external and internal shocks. Particularly, interaction between monetary and fiscal policies has become critical due to dynamic changes in the economies. The success of government policy makers depends on deep understanding of these shocks [1]. The originality of current study is that variables incorporated in Structural vector autoregressive system from four blocks i.e., international block, property block, fiscal policy block and monetary policy block.

It is realised by academic circles that the impact of monetary and fiscal policies should be analysed in tandem rather in insolation because both policies have vital role in economic and financial activities of the economy that ultimately results in stock markets' performance [2]. Ample of recent studies have examined the association regarding monetary policy and stock prices [e.g., 3, 4-7]. Contrarily, few studies have investigated the impact of fiscal policy on stock prices [8, 9]. Nevertheless, hardly a single study has analysed the impact of monetary and fiscal policy in tandem on the economy [10]. A recent study is conducted by Chatziantoniou, et al. [2], employing SVAR model using data from Germany, UK, and U.S. They highlighted the examining effect of monetary and fiscal policies isolation cannot help academic circles to reach at the truth because this type of analysis only shows one side of the picture and unable to explain the whole phenomena. Therefore, they suggested that we should examine the impact of fiscal and monetary policies in one model to explore the contemporaneous interaction of both policies with stock prices.

The focus of current study is on Malaysia, a developing economy. Malaysia has changed itself from manufacturer to multi sector economy since 1970's under the kind supervision of Najib (prime minister) and is aimed to be in the list of developed countries by 2020. Two of its main resources that are contributing to its revenues are oil and gas (i.e. 40%). Due to the global financial crisis, Malaysian real Gross Domestic Product (GDP) decreased gradually in last few years (i.e. 7.2% in 2010, 5.1% in 2011 and 4.4% in 2012). On the other hand its public debts increased by 4% in 2012. Similarly, house prices are showing a continuous increase even in the period of financial crisis and government expenditure demonstrates consistent increase in every year. Short-term interest rate, on the other side is also showing decreasing trend which means an expansion in monetary policy. Exchange rate are showing appreciating trend since 2008, whereas stock prices demonstrate increasing trend after 2008 crisis (See Fig. 1.1 to understand the current financial trends in Malaysian economy).

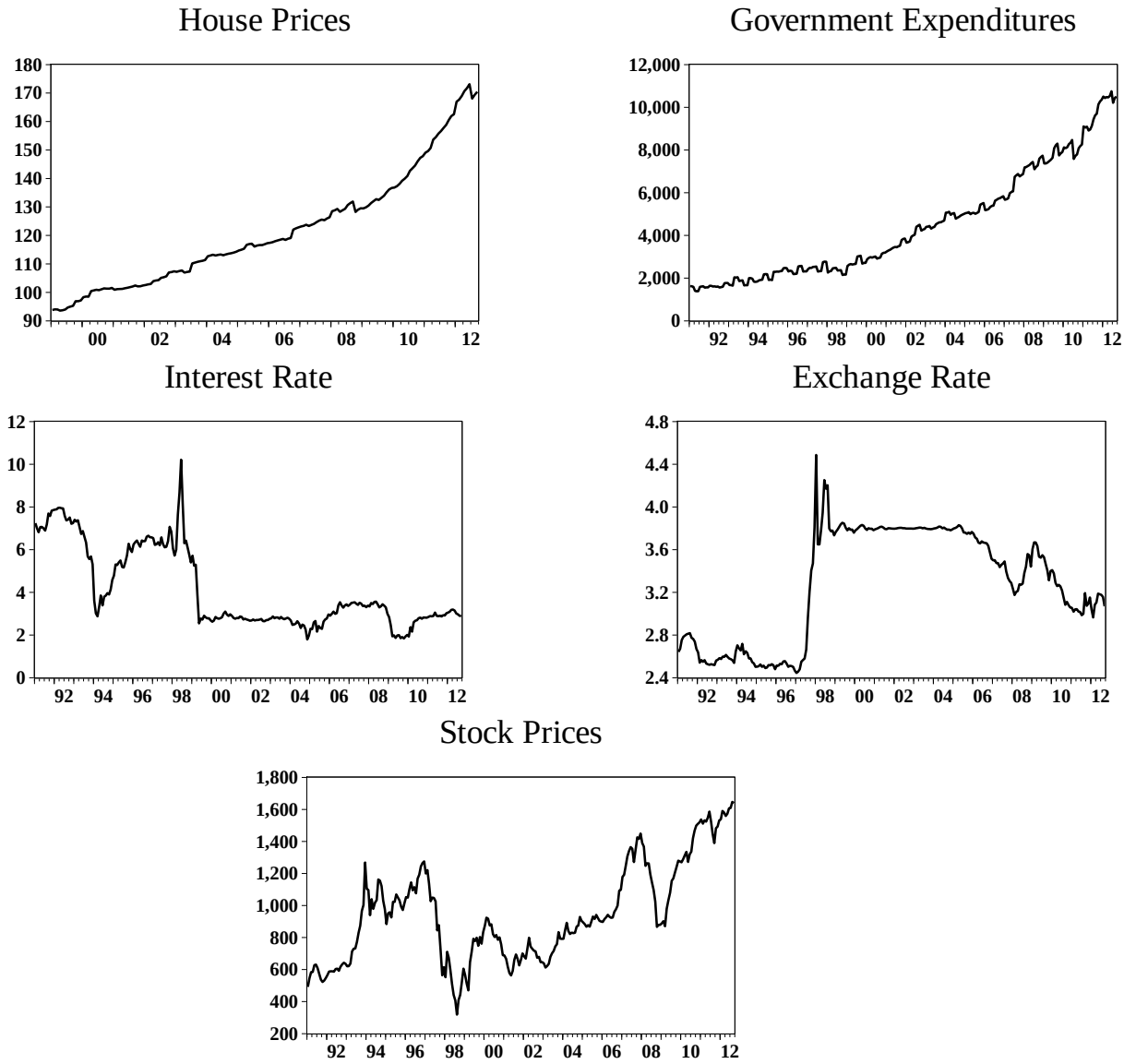


Figure 1.1 Malaysia Economic (House Property, Fiscal & Monetary) Condition

Current research is the bare need of this time as Bank Negara Malaysia is keenly interested to redress the challenges surrounding the monetary policy. It is highlighted that policy makers are encountering the issue of high volatility in financial markets and it emerged as a regular feature of these markets since global financial crisis of 2008. Liquidity and monetary policies measures adopted by advanced economies have fostered the waves of volatility in national economies resulting externalities and spillover effects. Therefore, this amplified volatility has changed the interacting behavior of macroeconomic and financial variables in response of monetary policy. The research on this area is urged by Malaysian financial and monetary authorities to explore the interaction between monetary policy and financial markets instability. Hence, current study is an attempt to satisfy aforesaid void.

Theoretically, neutrality of monetary policy is a big debate among financial economists. Even then, interaction between monetary policy and stock market is viable through interest rate channel, exchange rate channel, money supply channel and credit channel [2, 11].

2. Literature Review

As mentioned that current study endeavoured to cover the four more relevant variables to examine the impact on stock returns (see section 1). Review of previous studies is also divided into four parts in following.

2.1 International Block and Stock Returns

Over the last decade, the role of commodity markets (especially oil and gold) is increased in stock markets. On the one hand, oil market has critical role in determining the stock market returns and simultaneously it functions as a predictor of stock prices [12, 13]. A recent body of researchers have investigated an association between stock prices and oil prices using data from developed and emerging economies [14-18]. By the same token, gold market is considered as a safe haven in stormy weather and hedge against risky

investments. It is an ancient wisdom that gold does not lose its value and used as an investment instrument. Due to bad performance of financial markets, investors have diverted their investments in gold market and it entailed hikes in the gold prices [19, 20]. It is noted in findings of previous studies that oil and gold prices influence the stock prices equally in all regions [13, 21]. As [22] concluded that gold and oil prices have strong role in the volatility of S&P 500. Beckmann and Czudaj [23] also revealed that oil and gold markets are positively influencing the prices in the U.S. Additionally, [24] suggested that gold acts as hedge commodity in developed markets. Similar findings are reported by Creti, et al. [25] that gold acts as a safe-haven in turmoil regime. Ewing and Malik [26], findings suggest that information about interaction between oil and gold markets is beneficiary for financial market investors' for hedging. Among other international variables, oil and gold prices have significant association with stock returns. Therefore, world oil and gold prices are used in the current study.

2.2 Property Block and Stock Returns

Recent global boom and bust developments in house prices attracted the attention of financial researchers to investigate the dynamic behaviour of house prices [27-29]. Prior to global crisis, the prices of house property rose unprecedently and collapsed during the financial crisis [30]. The association between stock and real estate property is a contestable issue in the eyes of researchers and policy makers because of inconsistent results. For instance, Liu, et al. [31] pointed out two concepts, namely segmentation and integration about the relationship of stock prices and house prices. According to them, segmentation is a situation when investors are not earning the same expected return on house market and stock market. On the other hand, integration exists when investors is earning the similar risk-adjusted expected returns from house market and stock market. A number of financial researchers have noted association between stock prices and house prices [32-35].

Coinciding movement of house and stock prices is questionable issue whether both markets pushing to each other through feedback relation [36]. Based on this information, Kong [37] conducted a study on Malaysian markets. Kong [37] reported that, in Kuala Lumpur Stock Exchange (KLSE) trade is at premium (i.e. 156% of GDP) and has become the 4th expensive market of the world which is an alarming situation for Malaysia. In addition to this, Malaysian housing loans were 26.1% of its GDP in 2011 which are continuously rising since 1996. Today such housing loans have reached the limit of $ 222.2 billion which were only $25 billion in 1996 (approximately nine times higher). Giving consideration to above facts, the author reckoned that it is bare need of the time to study both markets in tandem.

2.3 Fiscal Policy Block and Stock Returns

Influence of fiscal policy over stock market is theorized in three different stances. First is classical stance which views that expansion in fiscal policy generates the crowding out effect in the economy as the loan-able fund becomes expensive for private sector due to high demand of funds by public. Interest initiate to surge and loanable fund become out of the reach of private sector. This situation effect economic activities negatively and resultantly to stock prices [38]. Second is Keynesian stance that suggests that expansion in fiscal policy supportive to boost aggregate demand in economies that becomes the cause for positive trend in economic activities. In the result of this stock markets performance also becomes positive due to health corporate sector [39]. Third is Ricardian stance that describe that role of fiscal policy is irrelevant and nothing is contributed by fiscal policy in stock prices [8, 40]. In nutshell, influence of fiscal policy on stock market may be negative, positive or irrelevant [2].

Literature is not reckoned the appropriate tool to estimate the fiscal policy innovations out of three i.e. borrowing, taxation, and expenditures [8]. Some of the researchers have found governmental expenditures contributing towards countries economy [41, 42]. Belo, et al. [43] avowed that government expenditures are more relevant to investigate the connectivity of fiscal policy with stock returns. Following the same, Chatziantoniou, et al. [2] used government expenditure as a measure of fiscal policy with stock returns. Based on this information, the current study applied government expenditures as appropriate measure of fiscal policy.

Potentially fiscal policy stance has significant role in stock prices, but interestingly little attention is given to explain role of fiscal policy with stock prices [44]. Theoretically, fiscal and monetary policies have mutually significant effect on stock returns [45]. On one side, the role of monetary policy on stock returns is well documented in literature, but what role fiscal policy plays to determine asset prices is need to emphasize [46]. Along with this, joint interaction between monetary and fiscal policy with stock prices is a neglected part of empirical literature [47].

Examining the effect of monetary and fiscal policies with stock price independently is only a half picture of the story which is practically feeble to present true picture [2]. For instance, Fiscal policy influences monetary policy through exchange rate and interest rate channels. Both policies interacted indirectly via different channels (e.g. inflation and deficit financing). Therefore, their interaction becomes more complex to investigate [46]. Furthermore, Reade [48] highlighted that both policies are rarely investigated theoretically vis-à-vis empirically. Therefore, study of fiscal and monetary policies is fruitful to find out the stability in financial markets and economies.

2.4 Monetary Policy Block and Stock Returns

Monetary policy and stock market relation is examined extensively by previous studies [e.g., 6, 49, 50, 51]. Among several channels, short-term interest rate and exchange rate channels are most relevant stock returns [49]. These channels have feedback relation with stock return [52].

Stock prices can be determined by the sum of future discounted cash flows for which model was developed by [53]. This model consists of two parts: estimated future flows and discount factor.

$$P_t = E_t \left\{ \sum_{j=1}^{K} \frac{D_{t+j}}{(1+R)^j} \right\} \quad (1)$$

Where P_t is denoted current price of a stock and D_{t+j} is discount value of future expect cash flows over the

K periods. E_t is express available information set at time t, whereas R_t is the discount factor used for discounting future cash flows.

Interest rate channel of monetary policy determines stock prices. When monetary policy rate is changed, it directly influence the discount factor (i.e. cost of capital) and eventually the discounted cash flow of the firm. Therefore a negative relationship between interest rate channel and stock prices is hypothesized in the literature [51, 54, 55]. In contrast, recent studies found asymmetric results about relationship between interest rate channel of monetary policy and stock prices [e.g., 3, 4, 49, 50, 56, 57].

Relationship between exchange rate and stock prices is a topic of interest for academic researchers as well as for international portfolio investors since 1980's due to liberalized global movement of capital. Theoretically, two groups of researchers which present two models that explain the relationship between both markets. First, "Flow-oriented model" that posit that stock prices are positively influenced by exchange rates. It is believed that this process is initiated by a change in price of foreign exchange. When devaluation occurs in a currency, consequent local currency to become cheaper in the international market and resultantly the exporting products of that country will also become cheaper. Therefore, if the country is export-dominate then the demand for its products becomes high, this lead to increase in exports and firm's profitability and this process ultimately leads a positive change in the stock prices [see, 58]. Second, "Stock-oriented model" that purports that exchange rates are negatively influence by stock prices. Model states that rising trend in the stock prices attract foreign investors for investment that not only increase the demand of foreign exchange, but also appreciate exchange rates and vice versa [59, 60].

Support for flow-oriented model is found by various researchers [e.g., 61, 62-68]. Support for stock-oriented model is found by [e.g., 69, 70-74]. However, it is evident from these studies that relationship between exchange and stock prices needs consensus and therefore, it should be further investigated.

3. Data and Methodology Description

3.1 Data Description

Monthly data is collected and analysed from period January 1991 to December 2012. Seven variables namely world oil prices (WOP), gold prices (GP), government expenditure (GE), house price index (HP), short-term interest rate (IR), exchange rate (ER) and stock returns (SR) are used for analysis. Data regarding all variable used in the current study is collected from reliable databases. Data for world oil prices and gold prices is retrieved from the U.S. Energy Information Administration (EIA) and Bank of England respectively. Data for house prices is retrieved from Bank for International Settlement (BIS) but data for house prices is used from January, 1999. Other series data is collected from DataStream database. Data used in analysis is seasonally adjusted and are used in natural logarithm except interest rate which is in percentages.

3.2 Methodology

Dynamic interaction of variables is selected from four channels i.e. international channel, property channel, fiscal policy channel and monetary policy channel. Structural VAR model is employed with seven variables by selecting two variables from international channel i.e. world oil prices, gold prices. One variable for property channel i.e. house prices and similarly one variable for fiscal policy channel i.e. government expenditures. Two variables selected from monetary policy channel are short-term interest rate and real effective exchange rate, while stock returns are used as an arbitrage variable. This combination of variable is chosen considering previous SVAR models as well as theoretical interaction among the variables. According to best of our knowledge this combination of variables is not examined by previous researchers.

Recently, some of the studies have examined the impact of oil prices on economy and stock performance [e.g., 75, 76]. Studies have concluded that rising oil prices increase the cost of capital; therefore, a negative relationship between oil prices and stock prices is expected. Since 2001 a persistent rise in gold prices has significantly influenced investors' behavior towards equity investment [77]. House property is emerged a new for last one decade and it is considered as an alternative investment channel by the investors. However, a very close relationship between house prices and equity prices is found by previous studies [78-80]. Government expenditure is considered as most appropriate variable to capture the impact of fiscal policy channel [2]. Short-term interest rate is believed to be a major tool for monetary policy to control the inflationary trend in the economy and influenced by fiscal policy channel and international channel as well. However, linkage of exchange rate channel with all variables is assumed in the model [75].

The general form of Structural VAR (P) is presented in the following:

$$A_0 y_t = C_0 + \sum_{i=1}^{P} A_i Y_{t-1} + \varepsilon_t \qquad (1)$$

Where y_t is a 7×1 vector for endogenous variables and $y_t = (WOP_t, GP_t, HP_t, GE_t, IR_t, ER_t, SR_t)$. A_0 shows a 7×7 contemporaneous matrix; A_i are 7×7 autoregressive coefficient matrices. ε_t represents 7×1 structural disturbance vector with zero covariance. However, covariance matrix for structural disturbances can be presented in this form $E(\varepsilon_t\varepsilon_t') = D \equiv [\sigma_1^2, \sigma_2^2, \sigma_3^2, \sigma_4^2, \sigma_5^2, \sigma_6^2, \sigma_7^2]\times1$.

The general form model in equation (1) will be converted into reduced form model by multiply both sides of equation by A_0^{-1} and shown as:

$$y_t = a_0 + B_i y_{t-i} + e_t \qquad (2)$$

Where, $a_0 = A_0^{-1}c_0, B_i = A_0^{-1}A_i$, and $e_t = A_0^{-1}\varepsilon_t$, i.e. $\varepsilon_t = A_0 e_t$. e_t, the reduced form errors represent the linear

function of structural errors ε_t with a covariance matrix i.e. $E[e_t e_t'] = A_0^{-1} D A_0^{-1'}$.

We imposed appropriate restrictions on A_0 to acquire structural disturbance. The short-run restrictions are imposed in the model in the following way:

$$\begin{bmatrix} \varepsilon_{OP} \\ \varepsilon_{GP} \\ \varepsilon_{HP} \\ \varepsilon_{GE} \\ \varepsilon_{IR} \\ \varepsilon_{ER} \\ \varepsilon_{SR} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & a_{35} & 0 & a_{37} \\ a_{41} & 0 & 0 & 1 & 0 & 0 & 0 \\ a_{51} & 0 & 0 & a_{54} & 1 & 0 & 0 \\ a_{61} & a_{62} & 0 & 0 & a_{65} & 1 & a_{67} \\ a_{71} & a_{72} & a_{73} & a_{74} & a_{75} & a_{76} & 1 \end{bmatrix} \begin{bmatrix} e_{OP} \\ e_{GP} \\ e_{HP} \\ e_{GE} \\ e_{IR} \\ e_{ER} \\ e_{SR} \end{bmatrix}$$

where $\varepsilon_{WOP}, \varepsilon_{GP}, \varepsilon_{HP}, \varepsilon_{GE}, \varepsilon_{IR}, \varepsilon_{ER}, \varepsilon_{SR}$ are showing the structural disturbances that are gold price shocks, World oil price shocks, house price shocks, government expenditure shocks, interest rate shocks, exchange rate shocks, and stock return shocks respectively. On the other hand, $e_{WOP}, e_{GP}, e_{HP}, e_{GE}, e_{IR}, e_{ER}, e_{SR}$ are the residuals of reduced for equations that measure the unexpected movements of variables separately with the information given in the system.

Prior to explain the restrictions plan for Malaysian economy SVAR model, it is noteworthy that these restrictions are considered to be contemporaneous that were imposed on A matrix whereas no restriction is imposed on lagged structural parameters of model. First two equations of the model do not hold any restriction except a_{21} being treating them as exogenous variables in the economy [see, 81]. It is assumed that surge in oil prices impact positively on gold prices [82]. The impact of both variables is assumed for Malaysian economy, but no inverse impact of other variables is expected for these variables [83]. Third equation is used for house prices and assumed to be influenced by short-term interest rate and stock returns through restrictions a_{35} and a_{37} respectively. Current interest rate is an important determinent of house prices (Elbourne, 2008). The borrowing cost is increased due to increase in interest rate that leads to fall in demand for property resulting decrease in prices. Additionally, rising interest rates increase the default in mortgage payment and households start to sell their house property and supply side of house property push down the house prices [84]. Making an allowance for wealth effect hypotheses, equity market leads changes in house prices. Therefore, impact of stock prices is included in this equation. In fourth equation, Impact of fiscal policy is measured through government expenditures as it is used by previous research because there is no consensus that which one of measures (i.e., borrowing, taxation and expenditures) is appropriate to examine the impact of fiscal policy shocks [8]. In this equation, impact of world oil prices is included using a_{41} restriction as the rise in oil prices negatively influences the government expenditures and government face difficult to maintain its expansionary fiscal policy and budget deficit is increased due to higher government expenditures [85, 86]. In fifth equation, interest rate channel of monetary policy is used. Oil prices restriction through a_{51} is imposed because it is considered that oil prices impact contemporaneously to short-term interest rates similar restrictions are imposed by Cologni and Manera [86]. Currently expansionary fiscal policy exists in Malaysia which impulses in the interest rates. Three responses are expected (Classical, Keynesian, and Ricardian) are theorized in literature [2]. Therefore, Restriction a_{54} is used to capture the impact of fiscal policy (through government expenditures) on interest rate channel of monetary policy. Equation six represents exchange rate channel of monetary policy and four restrictions a_{61}, a_{62}, a_{65} and a_{67} are imposed. Theoretical relation between exchange rates and oil prices is assumed due to changes in current account balance and transfer of wealth from oil-importing countries to oil exporting countries, therefore, this contemporaneous effect of oil price changes through a_{61} is empirically investigated [75]. Similarly, gold price changes have contemporaneous effect on exchange rates and these innovations are captured through a_{62} [87]. Gold is used as hedge against currency markets and protect the investors from loss of devaluation. However, a negative relation is expected for exchange rate and gold price [16]. Interest rate and exchange rates are closely related due to uncovered interest rate parity which investigated using a_{65} restriction. Interdependency exist between exchange rates and equity prices as explained in Flow-orient model vis-à-vis Stock-orient model and this linkage is measured through a_{67} [63]. In the last equation, it is supposed that all above variables contemporaneously influence the stock returns [2, 88].

The IS-LM frame suggests that stock market activities are interrelated with fiscal and monetary policy actions through interest rate and government spending. Changes in policy and interest rates instantaneously force the investors to revise their portfolios because of change carried out through tightening or easing the policy [89]. Exchange rates and short-run interest rates are key monetary transmission channels that influence the stock prices in ASEAN-5 countries. Therefore, it is suggested that Impulse Response Function (IRF) should be used to examine to identify the impact of shocks when they appear [90]. In post crisis, ASEAN-4 accumulated foreign exchange reserves to resolve the panic in financial stability. The returns on these funds provided a strong support to government expenditures for these countries to regain economic momentum as before crisis. However, the positive impact of government expenditure is expected for financial stability [91].

Table 4.1 Lag Length results according Information criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	904.0197	NA	2.39e-14	-11.50025	-11.36340	-11.44467
1	2209.397	2476.870	2.42e-21*	-27.60766*	-26.51284*	-27.16299*
2	2240.191	55.66557	3.06e-21	-27.37424	-25.32146	-26.54049
3	2273.481	57.19010	3.78e-21	-27.17283	-24.16208	-25.94999
4	2331.419	94.33607	3.43e-21	-27.28743	-23.31871	-25.67551
5	2362.453	47.74385	4.44e-21	-27.05709	-22.13040	-25.05608
6	2418.489	81.18094	4.24e-21	-27.14730	-21.26264	-24.75721
7	2472.577	73.50321*	4.22e-21	-27.21252	-20.36990	-24.43334
8	2516.609	55.88710	4.89e-21	-27.14883	-19.34824	-23.98057

* indicates lag order selected by the criterion

Table 4.2 Testing for unit roots (ADF and PP tests)

	Augmented Dickey Fuller Test		Philip Perron Test	
Variables	**Level**	**1st Difference**	**Level**	**1st Difference**
OP	-3.38	-10.47*	-3.23	-10.66*
GP	-3.36	-12.35*	-3.15	-15.76*
HP	-0.05	-13.01*	-0.05	-13.02*
GE	-4.17*	-9.11*	-4.01*	-16.18*
IR	-5.31*	-10.34*	-5.23*	-10.26*
ER	-2.15	-12.09*	-2.18	-12.09*
SR	-10.60*	-11.49*	-10.65*	-105.94*

*significant at 1 percent level

Table 4.3 Summary of Contemporaneous Co-efficients

a_{21}	a_{35}	a_{37}	a_{41}	a_{51}	a_{54}	a_{61}	a_{62}
-2.6608 (1.1391)	-0.8265 (0.6281)	-11.4121 (9.0764)	-0.0298 (1.1292)	-1.3070 (1.3116)	-3.3164 (2.9797)	1.8922 (1.1701)	-2.1043 (2.1658)
a_{65}	a_{67}	a_{71}	a_{72}	a_{73}	a_{74}	a_{75}	a_{76}
-0.5238 (0.6300)	-2.9349 (10.0772)	-0.4985 (1.3159)	3.2923 (2.0157)	72.8353 (53.4163)	4.1522 (2.9947)	-0.3494 (0.6549)	34.5273 (27.8347)

Empirical findings and interpretations

First of all lag-length order of variables is determined for analysis. Normally, information criteria are used to determine the lag-length order of variables. But, econometrics theory shows a picture of controversy about the selection of appropriate lag length order for VAR models [92-94]. Amongst all information criteria Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn information criterion (HQ) are widely used by the researchers. While debating on the above mentioned criteria, Brooks [95] pointed that there is no concrete principle for the selection of superior information criteria as some of the information criteria are efficient but not consistent, while others are consistent but not efficient. The results of lag length according to information criteria are mentioned in Table 4.1.

Cheung and Lai [96] criticized information criteria methods for selection of optimal lag length by arguing that information criteria do not perform well in empirical analysis when data series are representing moving average dependence. Based on the above mentioned information and criticism, information criteria procedure is not considered as an appropriate criterion to determine lag length as it may lead to poor performance, inefficiency and inconsistency. Instead, Hall [97] and Johansen [98] are of the view that the stage where VAR residuals are not serially correlated is the best point to select lag length order.

On the other hand, selection of low or high lag lengths are not problem free as low lag length leads to the problem of serial correlation, whereas high lag length leads to the problem of finite sample bias [99]. Current study applied information criteria method vis-à-vis residual test. Thus, based on above arguments about selection of appropriate lag length, the present study used lag orders where VAR residuals are serially uncorrelated and these lag lengths are varying country wise using residual test in accordance with [100]. Examining the residual tests lag 6 is selected for analysis.

Going ahead for SVAR analysis, stationarity of the variables was estimated through ADF and PP tests. A problem of unit root was found in the variables except government expenditures, interest rate and stock returns and results are presented in Table 4.2. Following the practice of previous researchers, level series are preferred by researchers to maintain consistency on the cost of efficiency. They argued that most of the information is lost if stationary series with differences are used in analysis [6, 75].

4.1 RESULTS FOR CONTEMPORANEOUS RESTRICTIONS

The likelihood test of over-identification restriction test shows chi-square value ($\chi^2(5) = 6.94$) with significance level of 22.51 percent that means that the over-identification restrictions cannot be rejected at any conventional

significance level. Contemporaneous coefficients with standard error are presented in Table 4.3.

As mentioned earlier restrictions used in over-identified SVAR model are statistically significant with a probability of 22.51%. This study focused on four blocks of variables (international block, house property block, monetary block and fiscal block). Two important variables from international block are used i.e. oil price and gold price. While, only single contemporaneous restriction a_{21} is imposed to examine the impact of oil price on gold price. Co-efficient is -2.6608 (note that this sign is negative because restrictions are imposed on A_0 matrix which is on left-hand side of the equation (1). When it is shifted on right-hand side of equation, this negative sign will be changed to positive) [101]. Coinciding movement of both variables has already identified by the previous studies and inflation is identified the reason behind this identical movement [21, 102]. However, it is hypothesized that oil price has positive impact on commodity prices including gold price. There are a number of reasons for hike in gold price and one of them is surge in oil prices and therefore, gold is used as a hedge against inflation. The results of the present study are in accordance with previous studies as they also noted a positive impact of oil price on gold prices [23, 103, 104]. Additionally, contemporaneous impact of oil price is also examined on government expenditures, short-term interest rates, exchange rates and stock returns through a_{41}, a_{51}, a_{61} and a_{71} respectively. Positive impact of oil price on government expenditures and short-term interest rate is investigated which indicates that upsurge in oil prices causes inflation. Tight monetary policy is used through raising the interest rates when economy is facing inflation pressure and fiscal expenditures are also increased due to inflation in the economy [e.g., 105, 106]. Negative influence of oil prices on exchange rate is found in Malaysia. Similar effect is expected for oil-exporting countries because oil price appreciate the currency, therefore, a negative relation is expected for oil-exporting countries [107, 108]. Positive impact of oil prices on stock returns is observed through high profitable level which raises the stock price similar results are found by Babatunde, et al. [109] in Nigeria while studying the relationship between oil price shocks and stock returns.

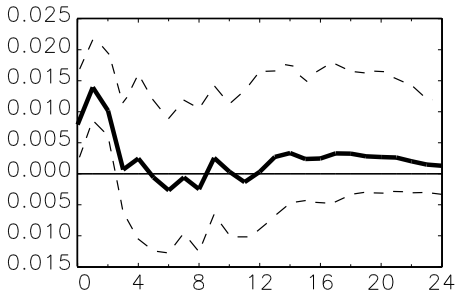
Second international variable is gold prices. Contemporaneous impact of gold prices is observed on exchange rates and stock returns through a_{62} and a_{72}. Relationship between exchange rate and gold prices is found to be positive which is unusual but this relationship is confirmed with the study of Pukthuanthong and Roll [110]. They suggest that the positive relation of gold with exchange rate with all currency including dollar and similar results are found in a recent study by [101]. Relationship between gold price and stock returns is found to be negative that clear shows that gold is used as hedge against stocks and similar result are witnessed by various previous studies [e.g., 20, 111, 112, 113]. Impact of house property block is examined through house price variable. Contemporaneous impact of house price is investigated on stock returns using a_{73} restriction. Results revealed a negative impact of house price on stock returns. This result suggests that house property income has no income effect on stock prices whereas positive impact of stock returns is visualized in the results using a_{37} which show the evidence of stock wealth effect on house property. It can be derived that surplus earned by equity investors are invested in housing market [114, 115]. In fiscal policy block, government expenditures are used as a fiscal variable because recently, every economy focuses on fiscal package to promote the economic growth to redress the evils of financial panic. Impact of government expenditures is also applied on interest rates and stock returns via restriction a_{54} and a_{74} respectively. Results identified that government expenditures negatively influence stock returns and positively interact with interest rates. In simple words, these results are showing the crowding out effect in economy which causes a decline in private sector investment activities due to transfer of funds to meet government financial needs. All the above results lead us to the conclusion that in Malaysia, fiscal tools are best to boost the economic activities. Furthermore, market interest rate is increased due to higher demand of funds and again economy trapped in economic breakdown which influence the stock prices negatively [10, 116-118].

Monetary block encompasses interest rates and exchange rate. Contemporaneous impact of interest rate is analysed with house prices, exchange rates and stock returns via a_{35} a_{65} a_{75} respectively. Positive impact of interest rate is observed on house prices. Recently, interest rate in Malaysia is increased, but on the other hand house prices are still showing a positive trend which is not negatively influenced by interest rates [57, 119]. Tightening the monetary policy negatively affect the economic activities which resultantly depreciate the currency, therefore a positive impact is exerted by monetary tightening on exchange rate [83, 120]. Generally, the negative relation is identified between interest rate and stock returns, but if there is bubble in the stock prices then the tightening in monetary policy is managed by the central banks. Relationship between exchange rate and stock return is examined through a_{67} and a_{76}. These restrictions are helpful to investigate the impact of both models ("Flow-oriented and Stock-oriented). When country is leading in exports, it causes an appreciation of the currency leading towards increased firm's profitability but negatively affecting exchange rates. However, Malaysia is net exporter country; therefore this relationship is not surprising for this country. Appreciation of exchange rate negatively affects the stock prices, but there exists a high value of standard error in the results, therefore, this relation is not statistical significant. On the basis of results it is inferred that portfolio balance model is not showing any significant influence in case of Malaysia.

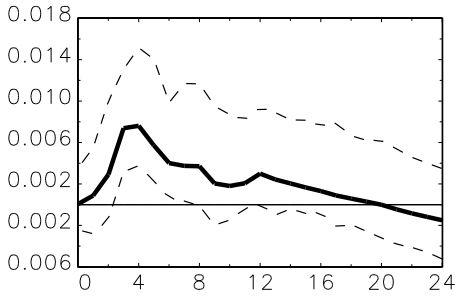
4.2 Impulse responses

Results of impulse response function in respect of oil price, gold price, house price, government expenditure, interest rate,

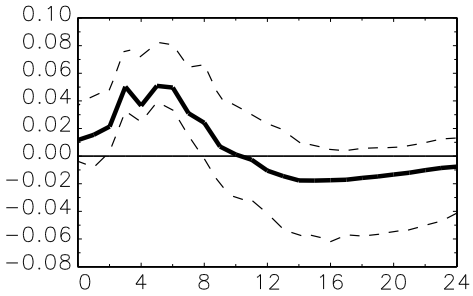
OP –> GP



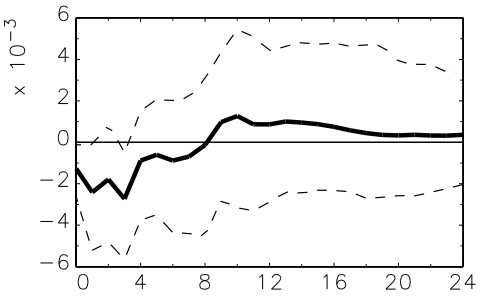
OP –> GE



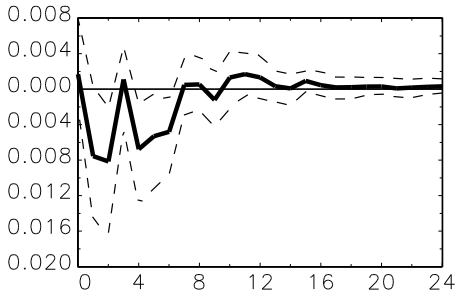
OP –> IR



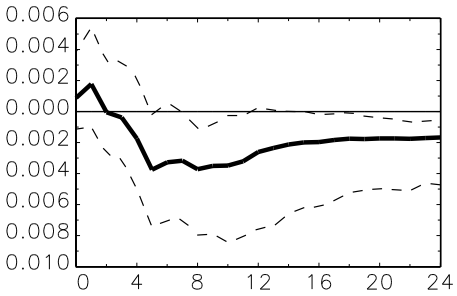
OP –> ER



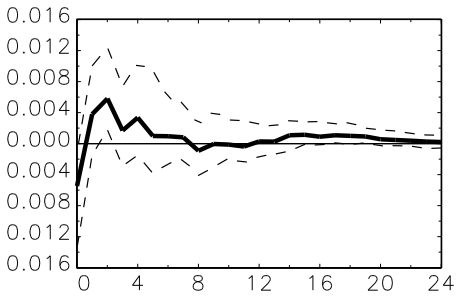
OP –> SR



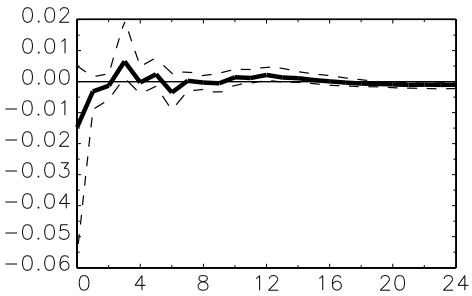
GP –> ER



GP –> SR



HP –> SR



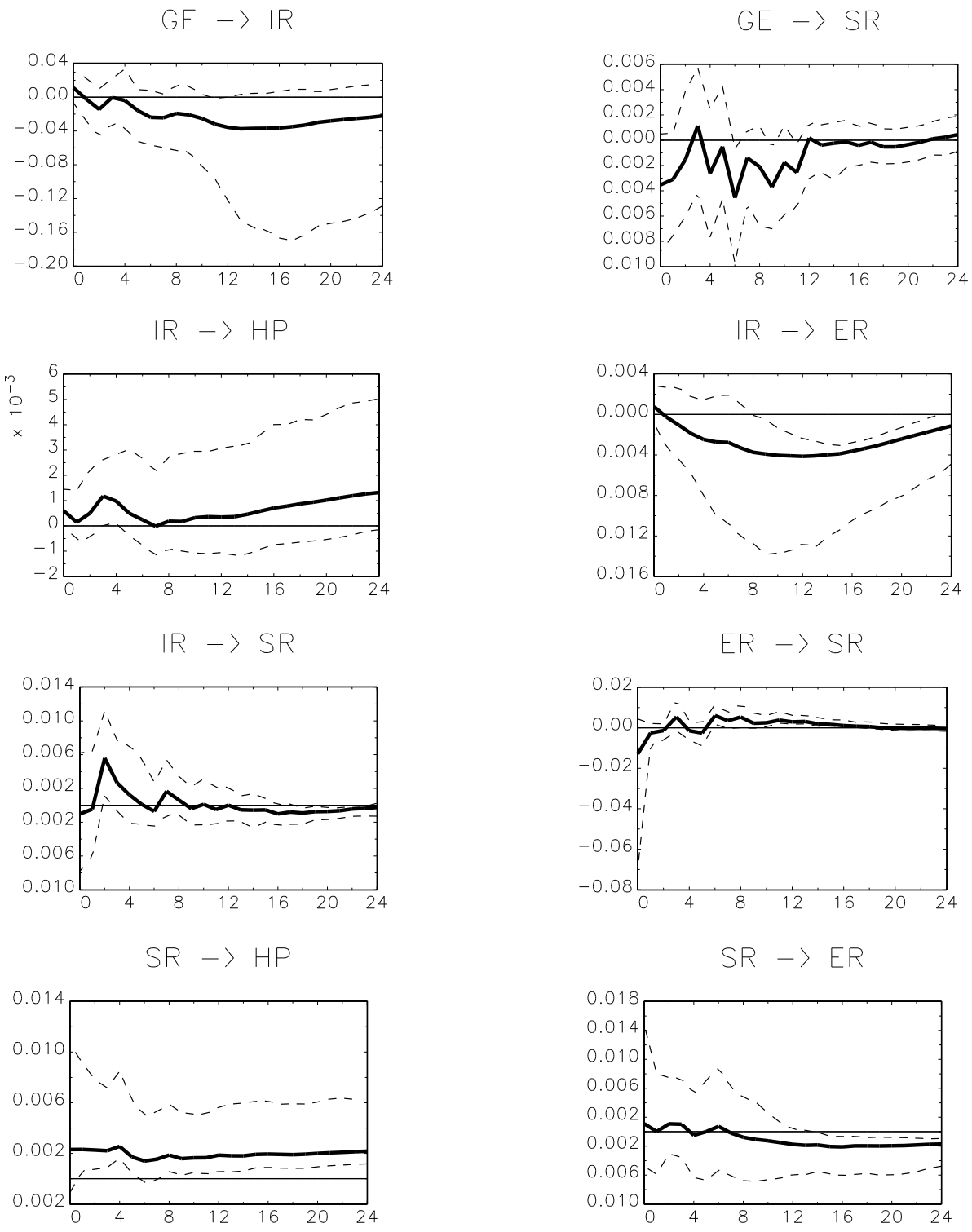


Figure 4.1 Impulse Responses in Malaysia

exchange rate, and stock return are presented in Figure 4.1. Oil price shock contemporaneously affect gold price, government expenditure, interest rate, exchange rate and stock returns. Contemporaneous positive impact of oil price on gold price is very strong in first 4 months and after that this impact becomes weak. Oil price shocks contribute positive and strong impact on government expenditures during 20 months and later become negative. During early 10 months, oil prices show strong positive change on interest rates and afterward this change becomes negative in remaining horizon. Exchange rates are negatively affected by oil price innovations during first 8 months and are positive till the end of horizon. While, the impact on stock returns by oil prices is negative up to first 8 months with a steep positive

jump while, followed period shows a little bit positive influence and afterward dies away in the system. It can be derived that impact of oil prices is significant on the variables mentioned above. Therefore, oil prices are very influential in Malaysia.

Contemporaneous impact of gold price is examined on exchange rates and stock returns. Immediate positive change in exchange rates by gold prices is transposed to be negative in complete horizon. Gold price initiated with negative change in stock returns which rise up steeply to positive and continue in early eight months, intersected zero line in the middle and lastly dies away. Contemporaneous reaction of stock returns to house price is expected. However, a short-lived negative impact by house price on stock returns are demonstrated in graph and afterward this response showed a mixed trend converging to zero. It is expected that government expenditures instantly influence interest rates and stock returns. In case of interest rate, positive influence is initiated but negative constant impulse response is demonstrated in the entire period. Furthermore, early 12 months of horizon are showing negative impulse responses by stock returns to government expenditures and after that such change converge to zero which finally died away. It can be derived that proof of crowding out through interest rate is not supported through impulse response but negative impact on stock returns is ultimate sign of crowding out.

Impulse responses identify a negative and sharp response by stock returns that jumped upward positively, but approached to zero in the following horizon. Contemporaneous reaction of house price and exchange rate to stock returns is assumed in the model. House prices are demonstrating a positive response to stock prices in the entire horizon and this impact is showing strong impact in the entire horizon. Therefore, wealth effect is clearly visualized by stock prices to house price, whereas initial response of exchange rates to stock return innovation is hybrid in early six months and afterward diverts negatively and continue till the of following horizon. These results are supportive to stock-oriented model. In next section 4.3, variance decomposition is discussed.

4.3 Variance Decomposition

Table 4.4 embodies variance decomposition for all variables used in the model exclusive of oil price and gold price as being to be international variables. Oil prices and gold prices reported 6% and 2% contribution in house prices in early six months and increased up to 9% and 20% accordingly. Interest rate hold up change of 32% in first six months that gradually falls to 9% and 16% at the end of 24 months; whereas government expenditure is showing constant change of 2% in the whole horizon. Meanwhile, exchange rate demonstrates a 15% change in early six months and increases up to 41% in last interval, while stock returns are showing consistent change of 3% on average basis. Variables own share of change also reduce from 39% to 9% during first early six months to 24 months.

HP=House Price; GE=Government Expenditure; IR=Interest Rate; ER=Exchange Rate; SR=Stock Return

Government expenditures are showing a 5% change by exchange rates and this contribution increased by 26% at the end of 24 months. Other variables namely oil price, gold price, house price, interest rate, and stock returns reported a constant change in government expenditures on average basis 5%, 6%, 5% but Interest rate and stock returns have not shown a remarkable change i.e. only 1%. Highest of this variable is its own. Short-term interest rate which is proxy for monetary policy shows a variety in response to variable's shocks. Early response for oil price and house price is 12% and 20% which falls to 9% and 10% respectively. Meanwhile, response for gold price, government expenditure and exchange rate is 1%, 1%, and 42% that rose up to 5%, 12%, and 53% respectively. Hence, the response to stock

Table 4.4 Variance Decomposition: Basic SVAR Model

VAR Decom	Period	OP	GP	HP	GE	IR	ER	SR
HP	6	0.06	0.02	0.39	0.02	0.32	0.15	0.03
	12	0.11	0.11	0.20	0.02	0.26	0.27	0.03
	18	0.11	0.15	0.12	0.02	0.20	0.36	0.03
	24	0.09	0.20	0.09	0.02	0.16	0.41	0.02
GE	6	0.06	0.06	0.06	0.74	0.01	0.05	0.01
	12	0.05	0.07	0.05	0.66	0.01	0.15	0.01
	18	0.04	0.06	0.04	0.61	0.01	0.22	0.01
	24	0.04	0.07	0.05	0.56	0.02	0.26	0.01
IR	6	0.12	0.01	0.20	0.01	0.19	0.42	0.04
	12	0.10	0.04	0.13	0.04	0.10	0.56	0.03
	18	0.09	0.05	0.11	0.09	0.08	0.56	0.02
	24	0.09	0.05	0.10	0.12	0.08	0.53	0.03
ER	6	0.02	0.02	0.03	0.01	0.02	0.62	0.28
	12	0.01	0.04	0.03	0.01	0.01	0.70	0.20
	18	0.01	0.05	0.03	0.01	0.01	0.71	0.18
	24	0.01	0.05	0.04	0.01	0.01	0.69	0.19
SR	6	0.11	0.05	0.24	0.02	0.20	0.25	0.13
	12	0.11	0.04	0.22	0.04	0.19	0.25	0.14
	18	0.11	0.05	0.22	0.04	0.19	0.26	0.14
	24	0.11	0.05	0.22	0.04	0.19	0.26	0.14

returns is 3% on average. This variable's own change is initiated from 19% in early six months and decreased to 8% at the end of 24 months.

In case of exchange rates, response to oil price, government expenditure and interest rate is 1% on average, while response to gold price and house is 4% and 3% on average. In addition, a response to stock returns is 28% in the start and afterward falls to 19% at the end of horizon. Variable's own change is 62 to 69% that means that variables are majorly self-determined. Meanwhile, each variable innovation made constant change in stock returns in the entire period. Hence, the effect of oil price is 11%, gold price is 5%, house price is 22%, government expenditure is 4%, interest rate is 19%, and exchange rate is 26% on average.

4. CONCLUSION

This study analysed monetary and fiscal in tandem with stock returns as previous studies have given scant importance to both in case of Malaysia. While the impact of both policies, two international variables (gold and oil prices) are included in analysis, additionally impact of house prices is also considered. These variables' importance has increase recently because of their influence in financial markets and crucial impact on economy growth. Impact of oil price is significant increased on gold prices and monetary and fiscal policies variables are also influenced by oil prices. In case of house prices, only wealth effect is found that means that stock returns are influencing the house prices but reciprocal effect is not found between the both markets. Impact of fiscal policy is not showing any proof of crowding effect on monetary policy but its interaction with stock returns is supportive to boost this market. Interaction of exchange rate and stock prices is supporting the portfolio model as foreign direct investment is encouraging in the economy. Current study is helpful to report instant information to enhance the understanding of government macroeconomic policy makers vis-a-vis the prospective and existing investors. In future, investors and policy makers should contemplate the impact of monetary and fiscal policies jointly to strength the financial markets, especially, the stock market in Malaysia.

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