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Roles of Housing Wealth and Financial Wealth in Monetary Transmission Mechanism in Malaysia

(Peranan Kekayaan Perumahan dan Kekayaan Kewangan dalam Mekanisme Transmisi Dasar Monetari di Malaysia)

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ABSTRACT

This study analyses the wealth channel of the monetary policy transmission mechanism in Malaysia. Given the underdevelopment and non-inclusion of housing wealth in previous literature regarding the wealth channel in Malaysia, this research aims to find out (1) whether monetary policy shocks significantly affect asset prices, (2) whether asset prices fluctuations have significant influences on household consumption, and (3) whether house prices and stock prices have significant and equivalent roles in the operation of the wealth channel. In order to fulfill the research objectives, this study employs a methodological framework of structural vector autoregression (SVAR). By constructing a SVAR model with 5 endogenous variables and 68 quarterly observations in Malaysia from 1999Q1 to 2015Q4, the findings support the positive impacts from monetary expansion to the asset price level, and later from asset price fluctuation on aggregate consumption spending in Malaysia. The effect of monetary policy is mainly transmitted through financial wealth, in particular, the stock market, whereas the contribution of housing wealth is virtually nil in the wealth channel.

Keywords: Monetary policy; Malaysia; structural VAR; house price; stock price

ABSTRAK

Kajian ini menganalisis saluran kekayaan terhadap transmisi dasar monetari di Malaysia. Memandangkan kemunduran dan kekayaan perumahan tiada dimasukkan dalam sorotan karya terdahulu tentang saluran kekayaan di Malaysia, kajian ini bertujuan untuk mengetahui (1) sama ada kejutan dasar monetari akan mempengaruhi harga aset, (2) sama ada turun naik harga aset mempunyai pengaruh penting ke atas perbelanjaan pengguna, dan (3) sama ada harga rumah dan harga saham memainkan peranan penting dalam operasi saluran kekayaan. Kajian ini menggunakan model vektor autoregresif berstruktur (SVAR) dengan 5 pemboleh ubah endogen dan data suku tahun bermula suku pertama tahun 1999 hingga suku keempat 2015, dan hasil dapatan kajian menunjukkan kesan positif daripada pengembangan kewangan ke atas harga rumah dan harga saham, dan daripada harga aset ke atas perbelanjaan penggunaan di Malaysia. Kesan dasar monetari terutamanya dihantar melalui kekayaan kewangan, khususnya, pasaran saham, manakala sumbangan kekayaan perumahan hampir tiada dalam saluran kekayaan.

Kata kunci: Dasar monetari; Malaysia; struktural VAR; harga rumah; harga saham

INTRODUCTION

Unlike fiscal policy, monetary policy indirectly affects real sectors through certain transmission channels, in which the most common example is the interest rate channel. The nature of monetary policy immediately raises some questions: How actually the implementation of monetary policy is transmitted through the medium, from the beginning to the end? What happens inside the "black box" of the system (Bernanke & Gertler 1995)? One way to unseal the black box is by carefully exploring the transmission mechanisms of monetary policy. A particular transmission mechanism will be the asset price channel or the wealth channel. The mechanism of the wealth channel is briefly described as follows: other things being equal, a monetary easing will boost asset values, which later induces an increase in non-labour wealth for those who are holding the asset and eventually increases household consumption due to a higher confidence on spending. Schematically, this is shown as:

Money↑ ⇒ asset values↑ ⇒ wealth↑ ⇒ consumption↑ ⇒ output↑

As one may perceive, the wealth channel can be divided into two links: monetary policy-asset prices and asset prices-consumption spending. The first link describes the positive relationship between monetary expansion and asset prices, and it is explained by finance

theories namely the cost of capital and the price-yield relationship. The second linkage elaborates the positive effects of asset prices and wealth on consumption expenditure, which in turn can be explained by the Life-Cycle Hypothesis on consumption (Ando & Modigliani 1963) and the Permanent Income Hypothesis (Friedman 1957). Given certain assumptions[1], both hypotheses suggest that the long-run marginal propensity to consume out of wealth (MPCW) is slightly lower than the real interest rate, regardless of the types of non-labour asset.

This conjecture is questionable if one considers the characteristics of different categories of asset, say, real estate properties vs. financial assets. Taking Malaysia as an example, the development of the stock market and the housing market in the small-open economy is somewhat uneven (see Figure 1). On one hand, the house prices grow steadily at an average annual rate of 5.6 percent across the span, although the Malaysian government had been taking frequent reforms onto this sector. On the other hand, while the average growth rate of the stock market is 7.9 percent, the stock prices movement exhibits a high volatility across the span. This volatility is blamed upon several major economic events that happened in the 2000s, for instance, the recorded drop of the Kuala Lumpur composite index (KLCI) with a magnitude of approximately 40 percent or 572 points in 2008 as compared to the peak in 2007 due to the 2008 global financial crisis.

As for the Malaysia housing market, the Malaysian house price index (MHPI) recorded an average annual growth rate of 9.2 percent from 2010 to 2015 as compared to the average annual growth of 3.4 percent over the previous decade. An analysis has been done to evaluate the potential determinants of the increasing house prices in Malaysia, and it found that these factors can be divided into three clusters, namely macroeconomic factors, financial factors and policy measures (Bank Negara Malaysia 2012). The increment in house prices in the year 2010 was mainly driven by the steady growth in real gross domestic product, demographic changes, consumer price inflation, producer price index, lending rate, real property gains taxes and consumer sentiment. These variables continued to drive rising house prices in the year 2012. Bank Negara Malaysia (2012) asserted that the changes in banks' credit policies brought limited impact to the increases in house prices. However, the Malaysian government had raised the real property gains tax in Budget 2014 and set the minimum price of properties that can be purchased by foreigners to curb property speculation (Bank Negara Malaysia 2014).

Besides the price volatility, the two types of assets behave differently in many other ways as well. Dvornak and Kohler (2007) summarise six arguments on different forms of wealth (such as financial versus housing wealth) shall induce heterogeneous consumption responses, including liquidity reasons (Pissarides 1978), utility derived from the asset ownership asset in terms of housing services or bequest motives (Bajari, Benkard & Krainer 2005; Mayer & Simons 1994; Poterba 2000), different distributions of assets across income groups, expected permanency of changes of different asset classes, mismeasurement of wealth, and psychological factors (Sherfin & Thaler 1988).

Assets holders may react differently to the change in the value of their equity stocks compared to the change in value of real estate, if they have considered the aspects outlined above. Surprisingly, numerous studies

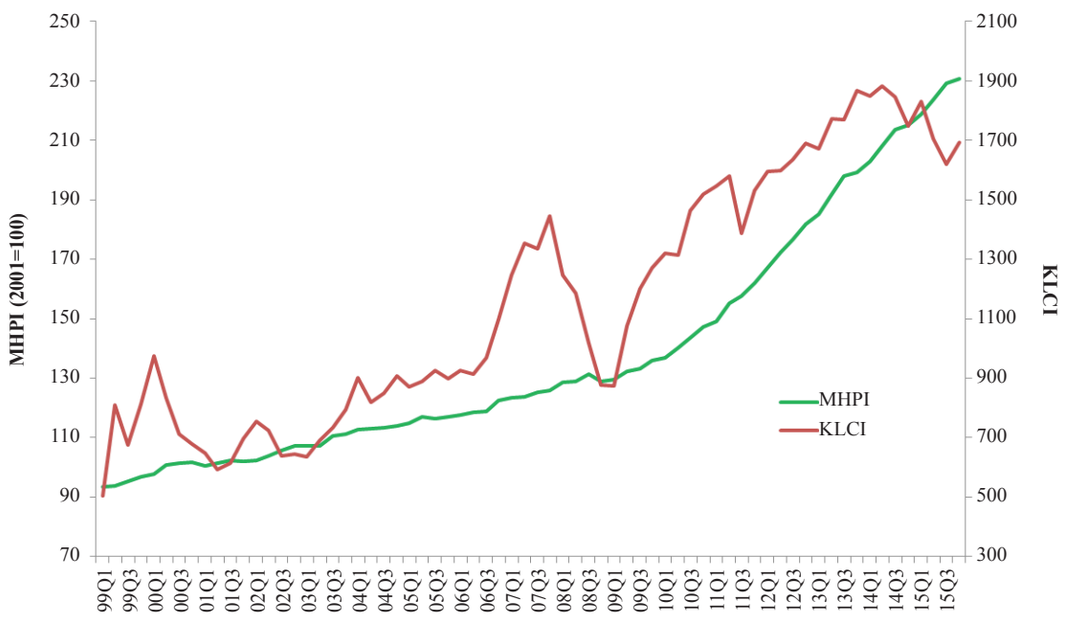

FIGURE 1. MHPI vs KLCI, 1999-2015

on the wealth channel consider only the aggregate wealth, which is typically proxied by financial wealth alone. (see, among others, Aleem 2010; Caporale & Williams 2001; Ludvigson & Steindel 1999; Paiella 2007; Tang 2006; Tan & Voss 2003). These findings often underestimate the strength of the wealth channel and conclude that the wealth channel is insignificant in monetary policy transmission. These incorrect specifications might lead to expensive mistakes of policy implication if both residential wealth and financial wealth are actually significant.

Likewise, this paper attempts to examine the wealth channel of monetary policy transmission mechanism in Malaysia. Specifically, this paper investigates whether the wealth channel of monetary policy transmission exists in Malaysia, if so, whether both housing wealth and financial wealth share an equivalent and significant contribution to household consumption. The novelty of this study to the existing literature is threefold. First, this paper correctly addresses the roles of housing wealth and financial wealth in the transmission of monetary policy in Malaysia's setting. By doing so, this study provides a comparison basis to the conclusions from previous research which, with the absence of housing wealth, often declare an insignificant or weak contribution of the wealth channel in the transmission mechanism in Malaysia. Second, the findings in this study could shed some light on the impact of monetary policy by the monetary policymaker. Third this study utilises the structural vector autoregression (SVAR) method, which is prevalent to the recursive vector autoregression technique that uses ad-hoc identification schemes.

The paper is organised as follow: Section 2 presents the stylised facts of asset prices and monetary policy of Malaysia. Section 3 highlights the employed data and estimation method. Section 4 analyses the empirical results. Lastly, Section 5 summarises and concludes the study.

LITERATURE REVIEW

In the literature of monetary policy transmission mechanism, the credit channel, amongst all, has drawn the most attention from researchers, as a result of empirical studies on channels other than the credit channel, for instance, the asset price channel, are few. Amongst these few include Ludvigson et al. (2002) who studied the importance of the wealth channel in the transmission of monetary policy in the United States. Their result suggested that the funds rate-induced changes in asset values brought little impact on consumption, indicating that the wealth channel played only a minor role in the monetary transmission mechanism. The authors attributed the weakness of the channel to the transitory effect of a funds rate shock on wealth, which typically fades off in less than two years.

In the case of developing countries, Disyatat and Vongsinsirikul (2003) attempted to investigate the asset price and exchange rate channels of monetary policy transmission in Thailand by treating equity price and real exchange rate as exogenous factors in their VAR models, thereby muting the effects of these initially endogenous conduits in the monetary policy transmission. Their results showed that the asset price channel is insignificant in Thailand as the capital market is still in its early development stages and equity holding accounts for a tiny fraction of the people's asset portfolios. In the case of China, Koivu (2012) tried to examine the existence of the wealth channel by constructing two five-variable SVARs with two alternative proxies for asset prices (housing and stock) and a relatively short observation of 44 quarters starting from 1998. The author asserted that household consumption reacts positively to an increase in both asset prices, but the stronger effect is seen in the changes in house prices. However, the author also claimed that the effect of monetary policy-induced changes on consumption is very weak and functional only through residential prices, while monetary policy did significantly affect asset prices. Koivu (2012) blamed the weak magnitude on the unpredictability of the Chinese stock market and the nature of durable consumer goods of properties, which may encourage households to reduce their investment in the respective assets and therefore weaken the wealth effect.

In the context of Malaysia, a small-open and trade-dependent economy, the existing literature regarding the monetary policy transmission mechanism is limited too. For instance, Azali and Matthews (1999) investigated the money and credit channels during the pre- and post-liberalisation horizon in the late 1990s. By adapting Bernanke's (1986) closed economy contemporaneous SVAR model, the authors declared that the money channel was more significant in influencing output fluctuations post-liberalisation, while credit channel is dominant during pre-liberalisation. Ibrahim (2005) used a recursive VAR to study the impact of monetary policy shocks on various industrial sectors, and concluded that the heterogeneous responses of various sectors to monetary shocks, where interest rate-sensitive sectors such as manufacturing, construction, finance, and real estate industry were more affected by monetary tightening. However, the choice of the 3-month Treasury bill rate as the monetary instrument may be less appropriate given the lack of breadth and depth of the debt market in Malaysia. A more recent study by Karim and Karim (2014) also evaluated the effects of domestic monetary policy on the macroeconomic variables of Malaysia by constructing an open-economy SVAR model. Their results showed that, given the exposure of domestic monetary policy to foreign shocks, both money supply and interest rate are significant in stabilizing output and inflation in Malaysia. Subsequently, Zaidi and

Karim (2014) and Zaidi et al. (2016) extended the study on monetary policy shock in Malaysia into different direction. Zaidi and Karim (2014) further assessed the impact of several foreign shocks from Singapore, Japan, and the US on Malaysian economy. By using a sign-restricted SVAR model, their results show that the foreign shock from Singapore appears to be the most dominant relatively to the shocks from the US and Japan. On the other hand, Zaidi et al. (2016) examined the effect of monetary policy shock on disaggregated inflation. They found that a modest monetary policy shock would trigger different degree of responses in disaggregated inflation, in which the varying levels of price stickiness are observed in different sectors.

Perhaps the first study that measured the relative importance of the monetary policy transmission channels in Malaysia was conducted by Tang (2006). He investigated the relative strengths of four monetary transmission channels in Malaysia by using a 12-variable small and open economy recursive-VAR model estimated from 1981Q1 to 2004Q1. By adopting the *shutdown* approach as in Ludvigson et al. (2002), the study concluded that the interest rate channel appears to be the most important transmission channel and this is followed by the asset price channel within a 2-year span. Nonetheless, the author found that the recursive identification technique was problematic for the 3-month interbank rate shock in which an exchange rate puzzle was observed.

Note that, despite the empirical evidence of the asset price channel in the context of Malaysia, none of these studies above recognises the role of the wealth channel in transmitting the monetary policy shock to the real economy sector, except Tang (2006). Even so, the author did not include housing wealth in representing the asset price channel, which the author blames upon data limitations in Malaysia. Given the fact that equity holding currently is not yet broadly undertaken by Malaysian households, it is likely that the reported evidence of the effect of the asset price channel is underestimated, as most, if not all, of the studies regarding the monetary transmission mechanism in Malaysia utilised only financial wealth as a proxy for total wealth. These incorrect specifications might lead to expensive mistakes of policy implication if both residential wealth and financial wealth are significant. Thus, this motivates us to re-examine the significance of the wealth channel by observing Malaysia, where the relevant literature is still underdeveloped, by carefully considering two disaggregated housing wealth and financial wealth.

METHODOLOGY

In line with the objectives, this study employs five endogenous variables for the SVAR analysis. The endogenous variables include aggregate household income, aggregate household consumption, the monetary policy indicator, housing wealth and financial wealth. The Malaysian household income and consumption are measured as the real GDP (Y) and final private consumption spending (CE), respectively. Monetary policy action is indicated by money supply ($M3$). Residential wealth and financial wealth are indicated by the Malaysian house price index (HP) and the Kuala Lumpur Composite Index (SP). All variables are quarterly observations from 1999Q1 to 2015Q4. We also included two exogenous factors, namely world oil price (WTI index) and foreign interest rate (U.S. Federal funds rate) to control for external shocks on domestic monetary policy as motivated by Cushman and Zha (1997), Kim and Roubini (2000) and Zaidi et al. (2013). All data are obtained from the Bank Negara Malaysia (BNM) monthly statistical bulletins, except the KLCI from Bursa Malaysia. Detailed descriptions of the data and variables are summarised in Table 1.

In order to analyse the effects of monetary policy on asset prices and then household consumption, this study utilises the VAR techniques developed by Sims (1980). The VAR model is preferable for handling the identification problem of the complex interrelationships that exist among endogenous macroeconomic variables. However, the basic forms of the VAR explain the dynamic relationships among the variables solely by their history. To circumvent this weakness, Sims (1986) and Bernanke (1986) suggested modelling the VAR using structural decomposition that relies on economic theory. Following the AB approach proposed by Amisano and Giannini (1997) an economy can be modelled in the following structural VAR at level form:

$$AX_t = \alpha_1 X_{t-1} + \ldots + \alpha_p X_{t-p} + B\varepsilon_t \qquad (1)$$

where A is an invertible $m \times m$ coefficient matrix of contemporaneous relationships, B is a $m \times m$ diagonal matrix, and $\alpha_i = AA_i$ are $m \times m$ coefficient matrices. The model residuals u_t are assumed to be linearly correlated to the structural errors ε_t, so that

$$Au_t = B\varepsilon_t \;\; or \; u_t = A^{-1}B\varepsilon_t \qquad (2)$$

where ε_t is assumed to be normally distributed with zero mean and to have a normalized diagonal variance-covariance matrix $\Omega = I$. System (2) basically illustrates the decomposition of the structural innovations ε_t into elements caused by the contemporary reduced-form shocks u_t, which reflects the fundamental economic shocks. Sufficient restrictions must be imposed on matrix A or B or both. For instance, $2m^2 - 0.5(m^2 + m)$ restrictions are required for the system to be exactly-identified (Amisano & Giannini 1997). In this study where $m = 5$, the minimum number of necessary restrictions is 35.

The SVAR model of the Malaysian wealth channel involves a set of series represented by the following vector X_t.

TABLE 1. Data sources and descriptions

Variable	Data	Source
WOP	Crude Oil Price, WTI Index Quarterly data from 1999:1 to 2015:4	U.S. Energy Information Administration (EIA)
FFR	Federal Funds Rate, Percentage Point Quarterly data from 1999:1 to 2015:4	IMF International Financial Statistics
Y	Gross national product, RM million. Quarterly data from 1999:1 to 2015:4, deflated by CPI, seasonally adjusted using Census X13 and in natural log.	BNM, Monthly Statistical Bulletin.
CE	Private final consumption expenditure, RM million. Quarterly data from 1999:1 to 2013:4, deflated by CPI, seasonally adjusted using Census X13 and in natural log.	BNM, Monthly Statistical Bulletin.
M3	Monetary aggregate, M3, RM million. Quarterly data from 1999:1 to 2015:4, end of period, deflated by CPI, seasonally adjusted using Census X13 and in natural log.	BNM, Monthly Statistical Bulletin.
HP	Malaysia house price index, 2000=100. Quarterly data from 1999:1 to 2015:4, deflated by CPI, seasonally adjusted using Census X13 and in natural log.	BNM, Monthly Statistical Bulletin.
SP	Kuala Lumpur Composite Index. Quarterly data from 1999:1 to 2015:4, end of period, deflated by CPI, seasonally adjusted using Census X13 and in natural log.	Bursa Malaysia

$$X_t = (CE_t, Y_t, M_t, HP_t, SP_t)' \tag{3}$$

where CE_t is the household real consumption expenditure, Y_t indicates the aggregate real income, M_t is the monetary policy indicator, HP_t and SP_t are the proxies for housing wealth and financial wealth, respectively. All series are expressed in natural logarithm. Then, the vector X_t is built into the following SVAR system.

$$AX_t = \alpha_1 X_{t-1} + \ldots + \alpha_p X_{t-p} + C + B\varepsilon_t \tag{4}$$

where A and B are diagonal 5 × 5 matrices of contemporaneous relationships and diagonal elements respectively, while C is a constant term that includes possible deterministic trends and/or structural breaks. In identifying the SVAR, this study develops the following identification scheme that is customised to the context of Malaysia:

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & a_{25} \\ a_{31} & 0 & 1 & 0 & a_{35} \\ 0 & 0 & a_{43} & 1 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 \end{bmatrix} \begin{bmatrix} u_t^y \\ u_t^{ce} \\ u_t^m \\ u_t^{hp} \\ u_t^{sp} \end{bmatrix} = \begin{bmatrix} b_{11} & 0 & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 & 0 \\ 0 & 0 & b_{33} & 0 & 0 \\ 0 & 0 & 0 & b_{44} & 0 \\ 0 & 0 & 0 & 0 & b_{55} \end{bmatrix} \begin{bmatrix} \varepsilon_t^y \\ \varepsilon_t^{ce} \\ \varepsilon_t^m \\ \varepsilon_t^{hp} \\ \varepsilon_t^{sp} \end{bmatrix} \tag{5}$$

which is modified from the setting of Koivu (2012). The sequences u_t and ε_t capture the reduced-form shocks and structural innovations of the VAR model, which correspond to each variable respectively. a_{jk} and b_{jk} are freely estimated parameters where a represents the contemporaneous shock and b is the orthogonal complements of the structural errors. System (5) is over-identified with 36 restrictions.

The theoretical underpinning of the first model of income is explained in the concept of wage rigidity (Christiano et al., 2005), household income is presumed too rigid to adjust immediately, thus it is not allowed to react contemporaneously to shocks of consumption, money supply, and asset prices. This setting is similar to Karim and Karim (2014) and Nizamani et al. (2015).

For the second equation of consumption spending, it is allowed to react immediately to real income shocks as in Ludvigson et al. (2002). Monetary policy shock is also allowed to affect consumption spending within a quarter, this practice is customary in existing literature (Bagliano & Favero 1998). Coming to the asset prices, the equation assumes that only the changes in stock price will induce a response in household consumption expenditure within a quarter, while the effect of house price shocks come with a lag, due to the different liquidity, stickiness and measurement accuracy of these two asset classes (Zaidi et al., 2016).

The setting of the third equation follows the standard Taylor rule, where the monetary authority would determine the monetary policy after observing the existing level of output and inflation, hence it is allowed

to respond immediately to shocks in national income (output) and stock price. Similar identifications were also found in Tang (2006), Koivu (2012), and Karim and Karim (2014).

Lastly, the fourth and fifth equations of asset prices are constructed based on the characteristics of the two asset classes, both asset prices are assumed to be likely to respond contemporaneously to a monetary shock. The stock price is allowed to react instantaneously to changes in all other variables as it is a fluid variable that is likely to react quickly to both fiscal and monetary events (Bernanke & Kuttner 2005; Jansen & Tsai 2010). House prices are assumed to receive the shocks from the other variables after a lag given the reason of price rigidity except for monetary policy shock.

SVAR ESTIMATION

As a preliminary step, we subject all endogenous variables to unit root tests. Table 2 summarises the result of the augmented Dickey-Fuller (1981) unit root test (ADF) and the Phillips-Perron (1988) unit root test (PP).

The conclusions from both unit root tests are generally in consensus, where *Y* and *SP* are stationary at level or *I*(0), while *CE*, *M*3, and *HP* are stationary only after first differencing or *I*(1). The above conclusion implies that the mixture of *I*(0) and *I*(1) series may share a common trend or cointegrating relationship among them. Therefore, we employ the ARDL bounds testing approach (Pesaran & Shin 1999; Pesaran et al. 2001) to detect any possible cointegrating relationship. Due to the relatively short length of observation (68 quarters), we use Narayan (2005) critical bounds values for the bounds test. Table 3 reports the result of the ARDL bounds test. The Wald F-statistic shows no rejection of the null, this implies that the variables are not cointegrated at 10 percent level. The result of the bound test has motivated us to estimate the SVAR at level with mixture of *I*(0) and *I*(1) variables, instead of estimate the SVAR model at first-difference to avoid information loss. Nonetheless, we do aware that the inclusion of *I*(1) series in the level SVAR estimation might lead to unstable estimates and exploding impulse response functions, therefore, a stability test is carried out to ensure that all roots of the characteristic polynomial of the SVAR model have a modulus less than unity. The result of stability test shows that all roots are less than one in absolute value[2], thus we conclude that our SVAR model at level is stable and the resulting impulse response functions do not explode[3] (Lutkepohl 1993).

Lastly, we estimate equation (4) by incorporating the structural identification as in equation (5). Apart from the five endogenous variables and the two exogenous variables, the estimation includes two dummy variables as well to capture the effect of currency peg-withdrawal from 1999 to mid-2005 and the effect of Global financial crisis in 2008 and 2009[4]. The optimal lag length of 1 is selected based on the Schwarz and Hannan-Quinn information criterion. As the structural identification is over-identified by 1 degree of freedom, the Likelihood Ratio test has been conducted to check the validity of over-identification. The test result suggests that identifying restrictions are valid at 10% significance level.

STRUCTURAL IMPULSE RESPONSE FUNCTIONS

The roles of housing wealth and financial wealth in transmitting monetary policy shocks can be observed through the responses of the target variables to unexpected shocks of other endogenous factors in the system. Figures 2 and 3 depict the structural impulse response functions (SIRF) yielded from the estimated equation (4), along

TABLE 2. Augmented Dickey-Fuller and Phillips-Perron Unit Root Tests

Series	Augmented Dickey-Fuller		Phillips-Perron	
	Constant	Constant and Trend	Constant	Constant and Trend
Y	-2.466	-3.931**	-2.517	-3.909**
CE	-0.959	-2.828	-1.279	-3.120
*M*3	-0.406	-2.002	-0.413	-1.752
HP	1.399	0.259	3.551	-0.023
SP	-0.418	-3.537**	-2.003	-3.940**
ΔY	-8.184***	-8.428***	-8.184***	-8.428***
ΔCE	-5.102***	-5.138***	-6.587***	-6.603***
Δ*M*3	-5.727***	-5.685***	-5.821***	-5.779***
ΔHP	-3.206**	-4.069**	-6.669***	-7.616***
ΔSP	-6.091***	-6.057***	-10.01***	-9.850***

Lag length selections for ADF test are based on AIC. The bandwidth selections and the spectral estimations in PP test are based on Newey-West and Bartlett kernel approach.
*, **, *** represents null rejection at 10%, 5% and 1% level of significance, respectively.

TABLE 3. ARDL Bound test

Model: CE = f(Y, $M3$, HP, SP)		
ARDL Order : (3, 3, 3, 3, 3)		
	Wald F-statistics = 3.190	
Level of significance:	Lower Bound	Upper Bound
0.10	2.574	3.682
0.05	3.068	4.274
0.01	4.188	5.694

Critical values obtained from Narayan (2005) assuming unrestricted intercept and no trend (Case III).

with the 95% confidence bands generated by Hall's bootstrapping method. The estimated impulse response is considered as statistically significant at 5% level if the corresponding confidence bands do not include zero.

Firstly, Figure 2 shows the monetary policy-asset prices link of the monetary transmission. Both house price and stock price have positively responded to one standard deviation shock in the money supply. However, significant effects are only found in stock price, where the responses of stock price are significant from the second quarter to the sixth quarter after the monetary policy shock has innovated, while the responses of house price are generally insignificant to the monetary policy shock. In addition, the positive responses of stock price are relatively larger in magnitude than the responses of house price, where the highest response is 0.033 percent to one standard deviation shock recorded in the fourth quarter. As the SIRFs suggest that monetary policy shocks have significant impacts on stock price, which lasts up to at least four quarters, we therefore conclude that monetary policy changes would lead to significant positive changes in asset prices, which suggests that the first link of the wealth channel transmission exists in Malaysia.

Coming to the second link of the wealth channel, Figure 3 shows that the shocks arising from house price have insignificant impact on consumption spending. Stock price shocks, in contrast to house price shocks, have positive and significant effect on consumption

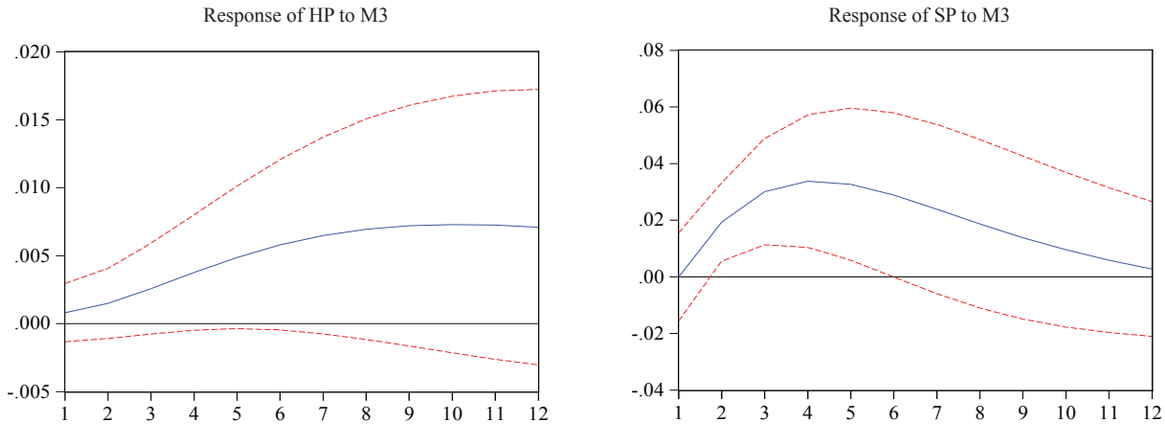

FIGURE 2. Structural Impulse Response Functions – Monetary Policy-Asset Prices

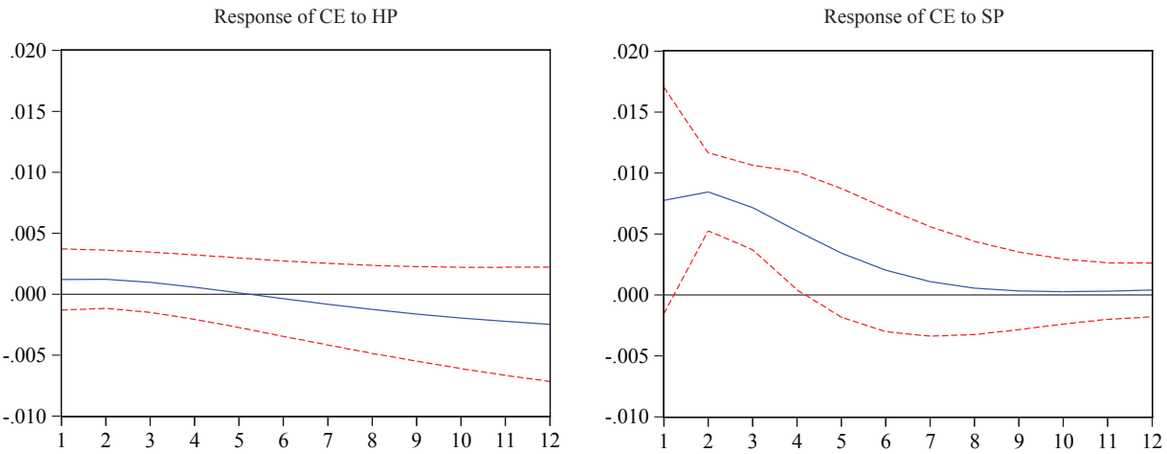

FIGURE 3. Structural Impulse Response Functions – Asset Prices-Consumption

spending. The peak response of consumption to the shock of stock price is observed in the second quarter, where one standard deviation of shock in stock price would lead to higher consumption by 1.011 percent. The positive effect of stock price is significant until the fourth quarter.

The observations above indicate that aggregate household consumption only significantly responds to the shocks of stock price and financial wealth, while house price and housing wealth are insignificant in influencing household consumption. This further implies that, if there is a well-functioning wealth channel in Malaysia, the monetary policy merely transmits through the financial wealth channel and then reaches to the household sector but not through housing wealth.

ROBUSTNESS CHECK[5]

We have considered several procedures for the robustness check on the baseline model. As such, we estimate the SVAR model using alternative monetary policy indicators, namely M1 and M2[6] and altering structural identification schemes. Overall, most of the resulting impulse response functions exhibit similar patterns to the benchmark models. This suggests that our baseline models are robust.

CONCLUDING REMARKS

This study analyses the wealth channel of the monetary policy transmission mechanism in Malaysia. Given the underdevelopment and non-inclusion of housing wealth in previous literature of the wealth channel in Malaysia, this research aims to find out (1) whether monetary policy shocks significantly affect asset prices, (2) whether asset prices fluctuations have significant influences on household consumption, and (3) whether the house prices and stock prices have significant and equivalent roles in the operation of the wealth channel. In order to fulfil the research objectives, this study undertakes a methodological framework of structural vector autoregression (SVAR). Specifically, this study constructs a 5-variable SVAR models using 68 quarterly data in Malaysia from 1999:1 to 2015:4. The resulting structural impulse response functions suggest that monetary policy announcements do positively affect the price level in stock market, where stock market is responding quickly and in a greater magnitude than the housing market. The evidence of a positive impact of monetary policy shock on asset prices is consistent with the previous findings of Basistha and Elbourne (2008), Bernanke and Kuttner (2005), Jansen and Tsai (2010), Karim and Karim (2014), Koivu (2012), Kurov (2010) and Wadud et al. (2012) among others.

The relationship between asset price fluctuation and aggregate consumption in Malaysia is established as well. Despite the marginal difference in terms of the magnitudes of MPCs due to housing wealth and financial wealth, it shows that only changes in stock market wealth are likely to significantly affect household consumption behaviour, whereas the contribution of housing wealth to consumption expenditure is insignificant. This evidence concludes the different roles of housing wealth and financial wealth that are played in the wealth channel in Malaysia, which supports the view that the role of financial wealth is more important than housing wealth in monetary policy transmission through wealth channel.

From the perspective of monetary policy, our findings suggest that the wealth channel could enhance the overall effectiveness of monetary policy transmission. Failure to recognise the contribution of wealth channel might result in an over-dampening effect if the monetary authorities intend to cool down an overheating economy by implementing monetary tightening policies. Thus, it is imperative that the monetary authorities be attentive to the presence of the wealth channel and how it influences household consumption behaviour through the conduit of financial wealth.

NOTES

1. Where a representative consumer intends to maximize its expected utility subject to the constraint of labor income and nonlabor wealth, under an infinite horizon of consumption planning, interest rate is constant and equal to the rate of time preference, and a no-Ponzi game condition, which rules out bequest motives in asset holding. See Altissimo et al. (2005) for a theoretical review of wealth effect.
2. The results of the stability test are not reported here to conserve space. The results are available upon request.
3. Interested readers can refer to Ramaswamy and Sloek (1997) for the rationale why level-VAR can be employed given the presence of nonstationary variables and cointegrating relations. In fact, the studies of monetary transmission mechanisms that employ level VAR outnumber those that use cointegrated VAR in the literature. See, for instances, Tang (2006), Bjørnland and Jacobsen (2010), and Koivu (2012).
4. The dummy variable of Global financial crisis is dropped later in the finalized model due to its insignificant effect.
5. The results of robustness checks are not reported here to conserve space. The results are available upon request.
6. Although a fruitful comparison can be made using other indicators for interest rate, but every candidate is suffering some problems for proper estimation. The overnight policy rate is of too short observations because it starts as late in April 2004, and there are missing observations in the money rates of longer maturity term.

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