International Journal of Academic Research in Accounting, Finance and Management Sciences
Vol. 7, No.1, January 2017, pp. 225–235
E-ISSN: 2225-8329, P-ISSN: 2308-0337

www.hrmars.com

Monetary Policy Inclusive Growth: Empirical Evidence from Malaysia

Lim Chia YIEN[1]
Hussin ABDULLAH[2]
Muhammad AZAM[3]
[1,2,3]*School of Economics, Finance and Banking, University Utara Malaysia, Malaysia,*
[1]*Email: gracelimchiayien@gmail.com (Corresponding author)*

Abstract *The static growth of foreign direct investment since 2006 and current growth per capita of 3.11% in 2015 about 4.89% in 1980 spark a growing interest in the role of monetary policy. The unexplored causal relationship between monetary policy, unemployment, foreign direct investment and economic growth in Malaysia represents a zone of the request, as it could spell issues for these countries in their arrangement in accomplishing growth per capita. This study plan to examine the dynamic relationship between monetary policy and economic growth for Malaysia during 1980-2015. It contended that presence of the structural break in the data generating process prompts to size distortion and false conclusion in the ADF model (Perron, 1989 and Lee and Strazicich, 2003). Henceforth, this study begins with testing for stationarity properties which consider structural breaks notwithstanding the conventional ADF test. We agree with the monetarist that changes in the money supply do not affect real variables over the long haul as no evidence of causality from inflation to output nor any causality from money supply to price level from this study. Instead of the money supply, results from VAR Granger Causality found that interest rate observed to granger caused growth per capita, money supply, inflation, unemployment and foreign direct investment. This study demonstrates that changing approach of monetary policy in Malaysia from monetary targeting to interest rates targeting, in fact, a fruitful execution. We found evidence of bidirectional causality between unemployment and growth per capita in this study also in line with Mohd Noor et al., (2007). Here, we propose that Malaysia needs to elevate foreign direct investment in term of expanding growth per capita as upheld by the result of VAR granger causality where foreign direct investment found to granger caused unemployment and growth.*

Key words Monetary policy; Economic Growth; causality; structural break; VAR; Malaysia

DOI: 10.6007/IJARAFMS/v7-i1/2634 URL: http://dx.doi.org/10.6007/IJARAFMS/v7-i1/2634

1. Overview of Malaysia 's economic and monetary structure

Malaysia economy has encountered negative scenes of growth per capita in 5 year periods as in 1985, 1986, 1998, 2001, and 2009. With -3.83%, -1.7%, -9.64%, -1.58% and -3.16% respectively due to oil price shock, Asian Financial Crisis and Global Financial Crisis as shown in Figure 1. Malaysia achieved rapid economic growth for the past decades. In the periods 1980-1989 and 1990-1999, the averages of real GDP growth were 5.7% and 6.9% in 2000; real GDP growth was 8.5% (Wong, 2013).

Foreign direct investment reached its peaked in 1982 with 8.53% and ever since never been above than that as shown in figure 1. Malaysia foreign direct investment has its lowest growth in 2000 with 0.13%. Since 1980, investment has been an increasing trend up till 1982, and ever since a declining trend until 2005 and a static trend from 2006 to 2015.

Money supply has reached lowest in 1990 with -43.74% and peak at 1992 with 71.91% as shown in figure 2. Inflation, interest rate, and unemployment are by all accounts in a similar pattern with each other. The interest rate has its peak at 9.75% growth in 1982 follow by its lowest in 2009 with 2.08%. Historically, the average long-term inflation in Malaysia by 2.9% is the lowest rate of inflation in the region (Ramli, 2012). Be that as it may, inflation was not able to be contained when the economy was having its high period of economic growth and have its peak growth at 9.7% in 1981 and its lowest point at 0.29% in 1987.

From 1982, the unemployment rate in Malaysia kept growing until it accomplished its apex of 7.4% in 1986 and turned to the reverse trend from 1989 in figure 2. From 1998 to 2004, the unemployment rate in Malaysia remained at a moderate level of approximately 3.5% and reached its lowest growth in 1997 with

2.4% growth. Malaysia was situated as the twentieth country with the most decreased unemployment rate of 3.1% in 2013 on the planet as demonstrated by the overall report distributed by International Labor Organization (Irpan *et al*., 2016).

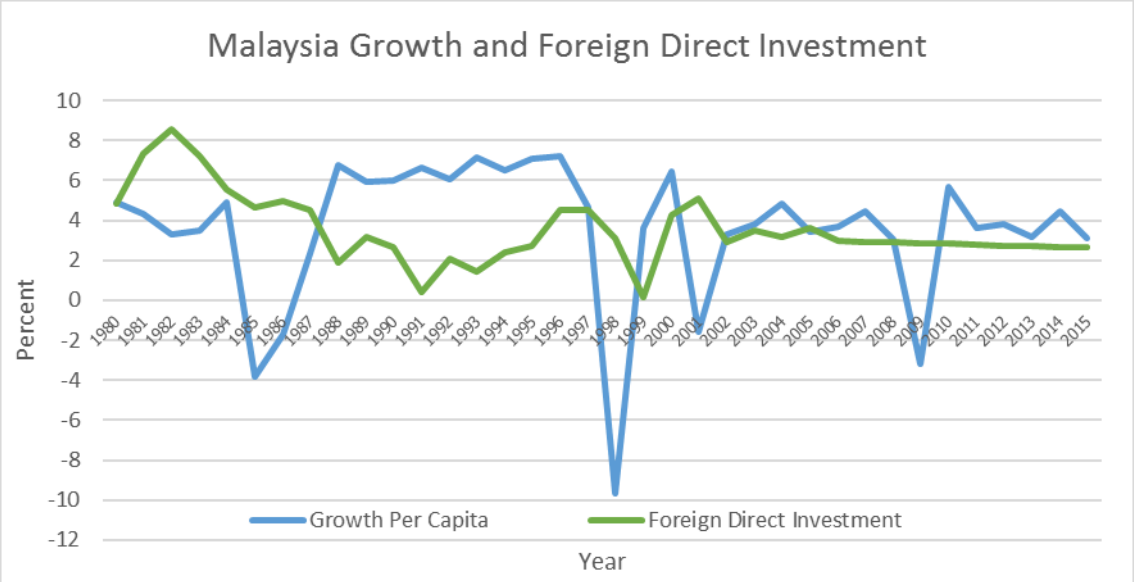

Figure 1. Malaysia Growth and Foreign Direct Investment

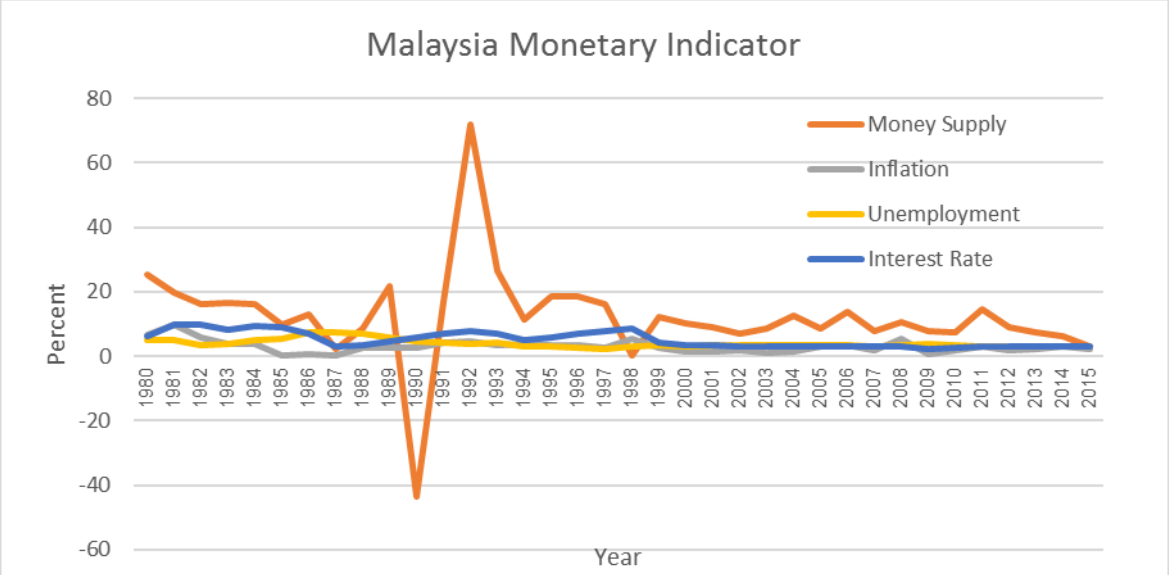

Figure 2. Malaysia Monetary Indicator

The unexplored causal relationship between monetary policy, unemployment, foreign direct investment and economic growth in Malaysia represents a zone of the request, as it could spell issues for these countries in their arrangement in accomplishing higher growth per capita. Thus, this study plans to discover the significance of the causal relationships between the inflation, unemployment, interest rate and investment in assisting policy makers in the future in identifying the source of growth.

2. Literature review

Solow's model shows that money is not relevant to economic growth because the output does not rely on monetary growth but capital available per worker, hence money is neutral. The Keynesians recommended that an adjustment in money supply may change the level of output via a change in the

interest rates. The monetarists contend that if the economy operates less than the full employment level, then an increase in money supply will lead to a rise in output and employment because of an increase in expenditure, but in the short run only. The monetarists believe that changes in money supply cannot affect real variables in the long-term (Chingarande, 2012).

Omoke and Ugwuanyi (2010) examined the causality between money, price, and output in Nigeria around 1970 and 2005, discovered money supply to Granger cause both output and inflation. Hussain (2011) Granger test suggests that inflation affects growth for the period of 1960-2006 in Pakistan while there is no reverse causation from growth to inflation. Inflation is a monetary phenomenon following the monetarist viewpoint and the quantity theory of money. Proof of short-run unidirectional causality between money supply and price demonstrate that monetary aggregate is a lead indicator of inflationary pressure in Malaysia (Ramli, 2012).

In the traditional Keynesian textbook IS-LM model, the interest rate channel is the key component in the monetary transmission mechanism (Loayza and Schmidt-Hebbel, 2002). The interest rate acts as an indirect tool of monetary policy according to Keynes produce ineffective monetary policy in stimulating economic growth. Interest rates can affect the overall production process occasionally with monetary policy. The relationship between real interest rates and growth rates has long interested economists. According to McKinnon (1973) and Shaw (1973), financial repression arises when a country imposes a ceiling on deposit. They conclude that alleviating financial restrictions and letting market forces determine real interest rates lead to higher real interest rates. The higher real rates of return lead to higher levels of savings, which in turn spur economic growth. Hence, the prediction from their framework is that real interest rates and growth rates are positively related (Hansen and Seshadri, 2013). According to (Zhou, 2015), the interest rate can reflect the cost price of capital and time preference of consumers and provide an excellent reference for investment and consumption.

The direction of causation between money and output is an important issue for many policymakers and economists since it uncovers appropriate monetary policy (Majid and Zulkhibri, 2007). The debate between structuralists and monetarists on the nature of the inflation and economic growth relationship over the past few decades where the former believe that inflation is essential for economic growth, whereas the latter see inflation as detrimental to economic growth (Datta and Mukhopadhyay, 2011).

The unemployment rate should be lessened to avoid the shortage of national production and the waste of human resources. Noor *et al*. (2007) said unemployment is significantly affecting GDP in Malaysia where one percent decrease in unemployment contribute to 1.75% increase in the GDP. Fluctuation in output and unemployment rely on upon monetary changes it is a pivotal issue in today's macroeconomics approach (Karanassou and Sala, 2010). The problem of high unemployment is a standout amongst domestic economic and political matters in any nation as high unemployment may provoke political leaders to restrict central bank's initiatives aimed at price stabilization if these actions worsen unemployment (Furuoka and Munir, 2014).

According to economic literature, one of the most essential elements for sustainable economic growth is the investment or capital accumulation, especially in determining the long-run productive capacity of an economy because investment creates new capital goods, and capital stock will grow quickly (Romer, 2001). Regarding FDI-led growth causality, Lean and Tan (2011) identified the one-way causal linkages between FDI and economic growth in Malaysia. From other aspects, the study of Srinivasan, Kalaivani, and Ibrahim (2010) and Tan and Tang (2011) reveal that FDI is bi-directional causality economic growth in Malaysia. Meanwhile, Omri and Kahouli (2014) have recently utilized the generalized method of moments to analyses the interrelationship among FDI, domestic capital, and economic growth in 13 Middle East and North Africa (MENA) countries. The study supports the view that bi-directional causal linkages exist between FDI and growth.

The motivation of this study comes from the fact that despite the importance of the structural break on the monetary policy to the Malaysian economy, there are only a few macroeconomic studies performed in this area. This study was also further motivated by Angeloni *et al.* (2003) that say changes in monetary policy have a persistent, though not permanent, an effect on output. This study uncovers if Malaysia monetary policy a monetary phenomenon, and if changing the approach of Bank Negara Malaysia from monetary targeting to interest rate targeting leads to growth per capita.

3. Methodology of research

3.1. Model specification, data sources and estimation procedure

The variables to be explained are the growth per capita. The above discussion shows that all variables mentioned above have a strong theoretical relationship with growth. The following expression can represent regression models to examine the relationship:

$$GPCG = f\left(BMG, INC, UN, IRD, FDT \right) \quad (1)$$

Growth derived from GDP per capita growth due to its essential measure as supported by (Lin and Ye, 2009). All variables expressed in real terms. Denoted above as growth per capita (GPCG), broad money growth (BMG), inflation of consumer prices (INC), unemployment rate (UN), deposit rate (IRD), and foreign direct investment, inward (FDT) as supported by Tan and Tang (2016). Data series collected from various sources like World Bank from WDI, International Financial Statistics from IMF and Oxford Economics.

ADF unit root tests provide biased results and less power to reject the null hypothesis if structural breaks exist (Perron, 1989; Perron, 1997; and Zivot and Andrews, 1992). Subsequently, this study represents for the existence of structural breaks in the data generating process. The structural breaks are identified using Lee and Strazicich (1999) endogenous minimum two break Lagrange Multiplier test as the remedy of the shortcoming of the traditional unit root test. Furthermore, LM test is not a break location dependent. Consequently, the analysis can consider up to two different breaks under the unit root null without relying on nuisance parameters. The test is unaffected by size and incorrect estimation irrespective of whether structural breaks presence or not (Adebola and Dahalan, 2012 and Lee and Strazicich, 2013).

The next stride is to ensure that the selected lag is appropriate with the test of VAR unit stability. Besides the instantaneous relationships, this study also examined the indirect and total effect of the endogenous variables on growth with impulse responses function (IRF). IRF is used to traces the effect of Cholesky one standard deviation shock of one variable in a current horizon on itself and innovations in other endogenous variables in the present and future horizons. A shock generated in one variable does not directly affect that variable, and it is also transmitted to all different endogenous factors indirectly through the dynamic lag structure of the VAR. Display in above equation (1) is regressed and composed as underneath:

$$GPCG_t = \alpha_1 BMG_t + \alpha_2 INC_t + \alpha_3 UN_t, \alpha_4 IRD_t, \alpha_5 FDT_t + \varepsilon_t \quad (2)$$

Based on the standard VAR estimation method, the model of the above equation containing these six variables can rewrite as follows:

$$\begin{bmatrix} GPCG_t \\ BMG_t \\ INC_t \\ UN_t \\ IRD_t \\ FDT_t \end{bmatrix} = \begin{bmatrix} A_1 \\ A_2 \\ A_3 \\ A_4 \\ A_5 \\ A_6 \end{bmatrix} + R(L) \begin{bmatrix} GPCG_{t-1} \\ M2_{t-1} \\ INC_{t-1} \\ UN_{t-1} \\ IRD_{t-1} \\ FDT_{t-1} \end{bmatrix} + \begin{bmatrix} et_1 \\ et_2 \\ et_3 \\ et_4 \\ et_5 \\ et_6 \end{bmatrix} \quad (3)$$

Where R is a 6 x 6 matrix polynomial estimator parameters, (L) is the lag operator, A is the intercept, and it is the Gaussian error vector with zero mean and variance matrix Ω.

The descriptive statistics of the variables presented in Tables 1 for Malaysia, for the period of 1980-2015. The tables show that the average growth per capita of Malaysia is 3.55%, with a minimum value of a -

9.64% and a maximum value of 7.23%. From this simple description, the money supply growth was inconsistent with a standard deviation of 15.06%.

Table 1. Descriptive statistic

	GPCG	BMG	INC	UN	IRD	FDT
Mean	3.55	12.27	3.03	3.95	5.11	3.53
Maximum	7.23	71.91	9.70	7.40	9.75	8.53
Minimum	-9.64	-43.74	0.29	2.40	2.08	0.13
Std. Dev.	3.53	15.06	1.92	1.30	2.45	1.75

Note: GPCG, BMG, INC, UN, IRD, and FDT represent gross domestic product per capita, broad money growth, inflation of consumer prices, unemployment rate, deposit interest rate, and foreign direct investment, inward are expressed in percentage. The number of observations in this study is 36 for each variable.

Table 2. Correlation analysis

Probability	GPCG	BMG	INC	UN	IRD	FDT
GPCG	1.00					
BMG	0.20	1.00				
	(0.24)	---				
INC	0.18	0.32*	1.00			
	(0.30)	(0.06)	---			
UN	-0.11	-0.03	-0.10	1.00		
	(0.51)	(0.85)	(0.58)	---		
IRD	-0.10	0.30*	0.55***	0.18	1.00	
	(0.58)	(0.08)	(0.00)	(0.30)	---	
FDT	-0.18	0.04	0.28*	0.16	0.50***	1.00
	(0.29)	(0.82)	(0.10)	(0.35)	(0.00)	---

Note: GPCG, BMG, INC, UN, IRD, and FDT represent gross domestic product per capita, broad money growth, inflation of consumer prices, unemployment rate, deposit interest rate, and foreign direct investment, inward are expressed in percentage. ***, **, and * indicate rejection of the null hypothesis of no correlation among the variables at 1%, 5%, and 10% respectively. The values in parentheses denote the probability values.

The results of the correlation test between the dependent variable and independent variables proved to be very useful in pre-estimation analysis about the potential relationships suggested by theories. Tables 2 depict the correlation coefficients and their respective probability values. The results show that money supply positively associated with the inflation and interest rate at 10% level of significance. Inflation also positive related to interest rate and foreign direct investment at 1% and 10% level of significance and the interest rate positively associated with foreign direct investment at 1% level of significance in Malaysia.

4. Results and discussions

Analysis results obtained based on the VAR testing procedures initiated by the structural break unit root test, followed by impulse response and variance decomposition analysis and ended with granger causality test.

Table 3. Augmented Dickey-Fuller unit root test

Series	Constant without trend		Constant with trend	
	Level	First difference	Level	First difference
GPCG	-4.16***	-7.23***	-4.10**	-7.12***
BMG	-5.64***	-8.85***	-5.79***	-8.70***
INC	-4.48***	-5.20***	-4.08**	-5.30***
UN	-1.93	-3.49**	-2.41	-3.45*
IRD	-2.57	-4.88***	-3.64**	-4.84***
FDT	-2.84*	-6.79***	-2.88	-6.98***

Note: ***, ** and * represent significance level at 1%, 5% and 10% respectively.

The figures are the *t*-statistics for testing the null hypothesis that the series has a unit root. The lag length is automatically determined based on general to specific. The critical values for intercept without trend are -3.56, -2.92 and -2.60 whereas, for intercept with trend the values are -4.14, -3.50 and -3.18 for 1%, 5% and 10% respectively.

Table 4. Lee and Strazicich two-break minimum LM unit root test

	Model A					Model C				
Series	k	$\hat{T}_B$	$\hat{t}_{\gamma j}$	*Test Statistic*	λ	k	$\hat{T}_B$	$\hat{t}_{\gamma j}$	*Test Statistic*	λ
GPCG	1	1985	-1.54	-4.91[A]	-0.05	1	1987	2.77**	-5.67[A]	0.08
		1996	-0.13		-0.00		2001	-1.48		-0.04
BMG	1	1984	-0.59	-5.94[A]	-0.02	1	1989	-9.72***	-10.31[A]	-0.29
		1988	0.67		0.02		1994	-9.87**		-0.29
INC	1	1984	-3.54***	-4.01[A]	-0.10	1	1989	4.13***	-4.68[B]	0.01
		1987	0.93		0.03		2000	-1.30		-0.04
UN	1	1987	1.75*	-3.74[A]	0.05	1	1985	1.40	-5.56[A]	0.04
		1993	-2.91**		-0.09		1994	3.61***		0.11
IRD	1	1984	0.08	-4.26[A]	0.00	1	1984	-3.69***	-5.20[A]	-0.11
		1998	-4.10***		-0.12		1998	3.25***		0.10
FDT	1	1987	-2.82**	-4.51[A]	-0.08	1	1984	-3.97***	-6.03[A]	-0.12
		1993	0.34		0.01		1993	3.61***		0.11
Critical values		1%	5%	10%						
Model A		-4.24	-3.57	-3.21						
Model C		-5.11	-4.50	-4.21						

Note: k is the optimal number of lagged first-difference terms included in the unit root test to correct for serial correlation. T_B denotes the estimated breakpoints. $\hat{t}_{\gamma j}$ is the *t* value of DT_{jt}, for j=1. The symbol, λ represents critical value break points. See Lee and Strazicich (2013) page 2488, for the critical values. A, B and C indicate the significance of the LM test statistics at 99%, 95%, and 90% significance level, respectively. While ***, **, and * mean the two-tailed significance level of the break date at 99%, 95%, and 90% respectively.

Table 5. Lee and Strazicich two-break minimum LM unit root test

	Model A					Model C				
Series	k	$\hat{T}_B$	$\hat{t}_{\gamma j}$	*Test Statistic*	λ	k	$\hat{T}_B$	$\hat{t}_{\gamma j}$	*Test Statistic*	λ
DGDPC	1	1987	1.95**	-7.79[A]	0.06	1	1997	6.35***	-8.33[A]	0.19
		2003	1.22		0.04		2001	-7.20***		-0.22
DBMG	1	1991	-3.95***	-10.63[A]	-0.12	1	1989	13.51***	-17.69[A]	0.41
		2008	-0.47		0.01		1993	-12.97***		-0.39
DINC	1	1997	2.04**	-2.99	0.06	1	1986	5.81***	-7.02[A]	0.18
		2003	0.42		0.01		2000	-1.42		-0.04
DUN	1	1988	-3.98***	-4.71[A]	-0.12	1	1987	-5.49***	-6.11[A]	-0.17
		2001	-0.31		-0.01		1998	2.88***		0.09
DIRD	1	1986	-2.87**	-3.49[C]	-0.09	1	1988	4.53***	-5.84[A]	0.14
		1990	0.76		0.02		2000	0.76		0.02
DFDT	1	1993	1.54	-4.69[A]	0.05	1	1986	3.82***	-7.77[A]	0.12
		2004	1.07		0.03		1996	2.23**		0.07
Critical values		1%	5%	1991						
Model A		-4.239	-3.566	-3.211						
Model C		-5.110	-4.500	-4.210						

Note: k is the optimal number of lagged first-difference terms included in the unit root test to correct for serial correlation. T_B denotes the estimated breakpoints. $\hat{t}_{\gamma j}$ is the *t* value of DT_{jt}, for j=1. The symbol, λ represents

critical value break points. See Lee and Strazicich (2013) page 2488, for the critical values. A, B and C indicate the significance of the LM test statistics at 99%, 95%, and 90% significance level, respectively. While ***, **, and * indicate the two-tailed significance level of the break date at 99%, 95%, and 90% respectively.

The LS test results presented in above table 4 and 5. Most of the breakpoints are significant under model A (intercept without trend) except growth per capita under model C (intercept with trend). The LS results are in line with ADF results in Table 3 except for unemployment which is found stationary at first difference at 5% (constant without trend) and 10% (constant with trend). Consequently, the integration order of the variables is resolved to be *I*(0) for all the series. In estimating the model, the optimum lag length selection sought. Appropriate lag length can be chosen through the 'Selection Criteria' like AIC, SIC, HQ. From Table 6 that LR, FPE, SC and HQ statistics for lag 4 are significant. Along these lines, lag four is decided for each endogenous variable in their autoregressive and distributed lag structures in the estimable VAR model.

Table 6. VAR Lag Order Selection Criteria

Endogenous variables: GPCG BMG INC UN IRD FDT
Exogenous variables: C DUM1
Included observations: 32

Lag	LR	FPE	AIC	SC	HQ
0	NA	39666.11	27.62	28.16	27.80
1	136.66	1350.12	24.17	26.37	24.90
2	65.64*	457.71	22.77	26.62	24.05
3	31.74	772.45	22.38	27.88	24.20
4	33.36	366.67*	19.07*	26.22*	21.44*

*indicates lag order selected by the criterion.

Upon the estimation of the VAR model, the roots of the characteristic polynomial were examined for VAR stability. From Figure 3, the inverse roots of the AR Characteristic Polynomials exist in the Unit Circle, thus, ensuring the stability of the VAR model.

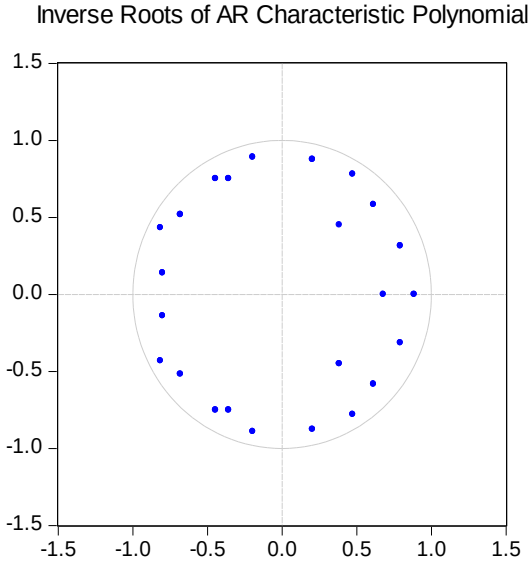

Figure 3. VAR Stability Condition

A one-standard-deviation shock to growth causes growth and reaches a maximum at eight quarters as shown in Figure 4. A one-standard-deviation shock to the money supply, inflation, unemployment, and interest rate fluctuate the growth over the period. The forecast error variance decomposition presented in Table 7. Although the explanatory power of growth on own innovation declined from the third horizon, this decrease was slow and stood at about 52% over the long haul. Foreign direct investment, money supply,

unemployment, and inflation explained 18%, 12%, 9% and 7% of the innovations in growth while interest rate only accounts 2%. This study uncovers proof of foreign direct investment is significant in altering GDP growth over the long haul.

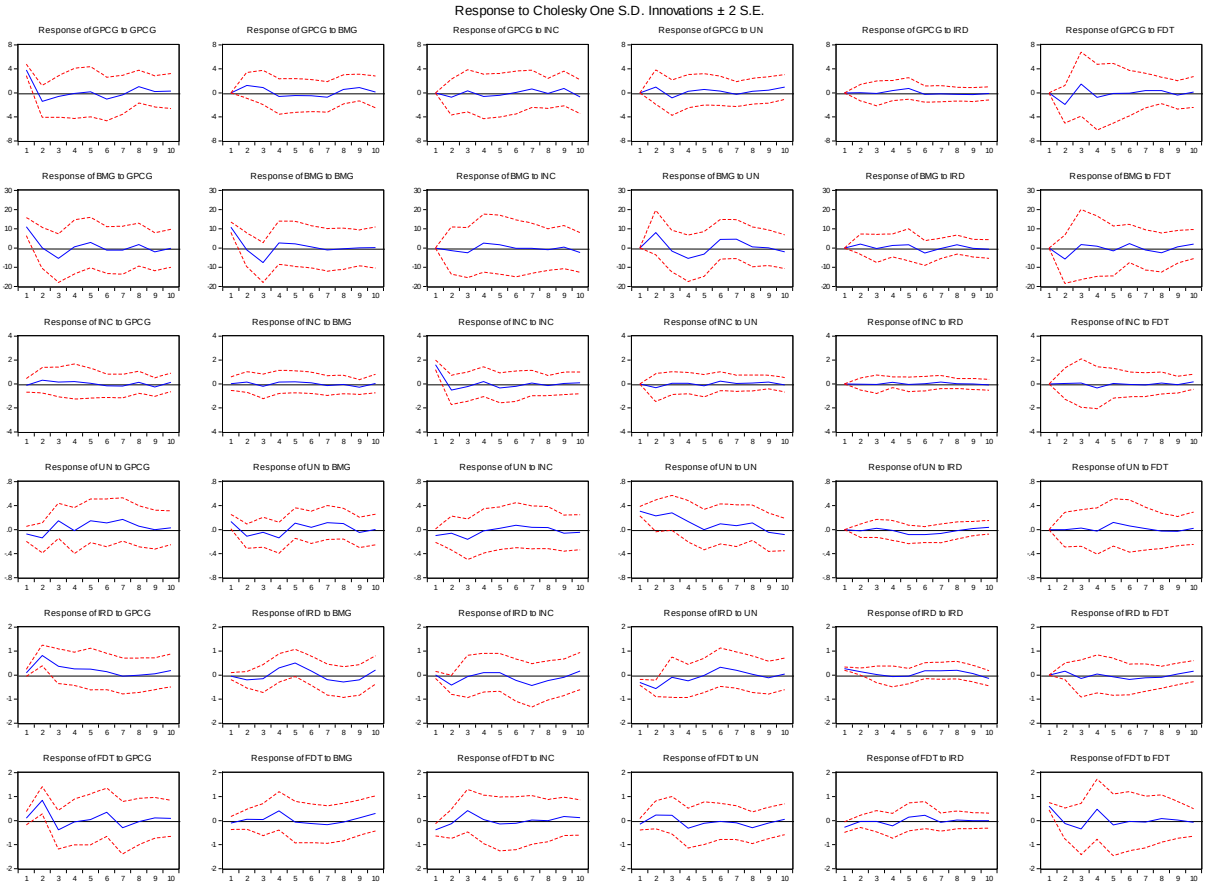

Figure 4. Impulse Response of Growth to Cholesky one standard deviation shock

Table 7. Variance Decomposition of GPCG

Period	S.E.	GPCG	BMG	INC	UN	IRD	FDT
1	3.82	100.00	0.00	0.00	0.00	0.00	0.00
2	4.82	71.73	6.36	2.14	3.86	0.00	15.91
3	5.22	62.47	8.14	2.22	5.82	0.03	21.32
4	5.36	59.23	9.07	3.33	5.72	0.52	22.13
5	5.48	56.86	9.36	3.76	6.51	2.28	21.23
6	5.61	57.64	9.64	3.59	6.50	2.38	20.25
7	5.72	55.78	10.79	4.78	6.43	2.37	19.86
8	5.87	56.22	11.16	4.57	6.31	2.42	19.33
9	6.02	53.58	12.78	5.80	6.57	2.55	18.73
10	6.14	51.69	12.32	6.77	8.74	2.47	18.02

*Cholesky Ordering: GPCG BMG INC UN IRD FDT

Table 8. Chi-square Statistic -VAR Granger Causality/ Block Exogeneity Wald Tests

Null Hypothesis	P-value
GPCG does not Granger Cause UN	0.06*
UN does not Granger Cause GPCG	0.05**
UN does not Granger Cause BMG	0.04**

Null Hypothesis	P-value
UN does not Granger Cause IRD	0.03**
IRD does not Granger Cause GPCG	0.00***
IRD does not Granger Cause BMG	0.00***
IRD does not Granger Cause INC	0.00***
IRD does not Granger Cause UN	0.00***
IRD does not Granger Cause FDT	0.01**
FDT does not Granger Cause GPCG	0.02**
FDT does not Granger Cause UN	0.03**

Note: ***, ** and * represent significance level at 1%, 5% and 10% respectively.

To measure the instantaneous relation between monetary policy and growth per capita the VAR granger causality test was conducted and exhibited in Table 8. Results from VAR Granger Causality found only unemployment have bidirectional causality with growth per capita. While unemployment is also observed to be granger caused money supply and interest rate. Interest rate to granger caused to growth per capita, money supply, inflation, unemployment, and foreign direct investment. Foreign direct investment observed to granger caused growth per capita and unemployment.

5. Conclusions

Utilizing VAR methodology to catches the dynamics of the policies likewise takes care of the endogenous issues of similar studies in this area, an empirical examination monetary policy and growth per capita with recursive VAR methodology conducted in Malaysia for the period of 1980-2015. This study evidence differs with Hussain (2011) and (Ramli, 2012) as no signs of causality from inflation to output nor any causality from money supply to price level from this study, hence concluding inflation is not a monetary phenomenon in Malaysia. Here we agree with the monetarist that changes in the money supply do not affect real variables over the long haul.

Instead of the money supply, results from VAR Granger Causality found that interest rate observed to granger caused growth per capita, money supply, inflation, unemployment and foreign direct investment. To the extent that history can tell, Bank Negara Malaysia has changed its monetary policy approach from monetary targeting towards interest rate targeting since November 1995 (Karim, 2014). This study demonstrates that changing approach of monetary policy in Malaysia from monetary targeting to interest rates targeting, in fact, a fruitful execution. In fact, (Elekdag *et al.*, 2012) argue that monetary policy implemented by the Bank Negara Malaysia (BNM) helped soften the impact of the global financial crisis of 2008–09.

Here, we propose that Malaysia needs to elevate foreign direct investment in term of expanding growth per capita as upheld by the result of VAR granger causality where foreign direct investment found to granger caused unemployment and growth. We found evidence of bidirectional causality between unemployment and growth per capita in this study also in line with Noor *et al*., (2007). They emphasize that unemployment rate should be reduced to avoid the shortage of national production. Our study agreed with Lean and Tan (2011) that identified one-way causal linkages between FDI and economic growth in Malaysia. Likewise, this study also by Irpan et al., (2016) that reckons Malaysia as a developing nation needs to bolster from different countries regarding foreign direct investment that adds to a higher employment rate.

References

1. Adebola, S. S., and Dahalan, J. (2012). Capital Mobility: An application of Saving-Investment Link for Tunisia. *International Journal of Economics and Financial Issues*, *2*(1), 1–11.

2. Angeloni, I., Kashyap, A. K., Mojon, B., and Terlizzese, D. (2003). *The output composition puzzle: a difference in the monetary transmission mechanism in the euro area and US* (No. w9985). National Bureau of Economic Research.

3. Chingarande, A. A. (2012). The Relative Effectiveness of Monetary and Fiscal Policies on Economic Activity in Zimbabwe (1981: 4-1998: 3). 'An Error Correction Approach'. *International Journal of Management Sciences and Business Research*, *1*(5), 2226–8235.

4. Datta, K., and Mukhopadhyay, C. K. (2011). Relationship between inflation and economic growth in Malaysia-an econometric review. *International Conference on Economics and Finance Research*, *4*(1), 415–419.

5. Elekdag, S., Lall, S., and Alp, M. H. (2012). *An Assessment of Malaysian Monetary Policy During the Global Financial Crisis of 2008-09*. *International Monetary Fund* (Vol. 12). http://doi.org/10.5089/9781463933203.001

6. Furuoka, F., and Munir, Q. (2014). Unemployment and Inflation in Malaysia: Evidence from Error Correction Model. *Philippone Journal of Development*, *1*(1), 35–45.

7. Glynn, J., Perera, N., and Verma, R. (2007). Unit root tests and structural breaks: a survey with applications. *REVISTA DE METODOS CUANTITATIVOS PARA LA ECONOMIA Y LA EMPRESA*, *3*(1), 63–79. http://doi.org/10.5093/cl2010v21n1a6

8. Hansen, B. E., and Seshadri, A. (2013). *Uncovering the relationship between real interest rates and economic growth. Michigan Retirement Research Center Research Paper*. Retrieved from http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp303.pdf

9. Hussain, S. (2011). Inflation and Economic Growth: Evidence from Pakistan. *International Journal of Economics and Finance*, *3*(5), 262–276. http://doi.org/10.5539/ijef.v3n5p262

10.Irpan, H. M., Saad, R. M., Nor, A. H. S. M., Noor, A. H. M., and Ibrahim, N. (2016, April). Impact of Foreign Direct Investment on the Unemployment Rate in Malaysia. In *Journal of Physics: Conference Series* (Vol. 710, No. 1, p. 012028). IOP Publishing.

11.Karanassou, M., and Sala, H. (2010). The US inflation–unemployment trade-off revisited: New evidence for policy-making. *Journal of Policy Modeling*, *32*(6), 758–777.

12.Karim, Z. A. (2014). Interest rates targeting of monetary policy: an open economy SVAR study of Malaysia. *International Journal of Business*, *16*(1), 1–22. Retrieved from http://www.ukm.my/fep/perkem/pdf/perkemVIII/PKEM2013_4C5.pdf

13.Lean, H. H., and Tan, B. W. (2011). Linkages between foreign direct investment, domestic investment and economic growth in Malaysia. *Journal of Economic Cooperation and Development*, *32*(4), 75.

14.Lee, J., and Strazicich, M. (1999). Minimum LM unit root test with two structural breaks. *Department of Economics, University of Central Florida*, *53*(4798), 1–30.

15.Lee, J., and Strazicich, M. C. (2003). Minimum Lagrange Multiple Unit Root Test With Two Structural Breaks. *Review of Economics and Statistics*, *85*(4), 1082–1089.

16.Lee, J., and Strazicich, M. C. (2013). Minimum LM unit root test with one structural break. *Economics Bulletin*, *33*(4), 2483–2492.

17.Lin, S., and Ye, H. (2009). *When Does Central Bank Independency Matter?*

18.Loayza, N., and Schmidt-Hebbel, K. (2002). Monetary policy functions and transmission mechanisms: an overview. In *Monetary Policy: Rules and Transmission Mechanisms* (pp. 1–20). Bank of Chile.

19.Majid, A., and Zulkhibri, M. (2007). Causality link between money, output and prices in Malaysia: an empirical re-examination. *Applied Econometrics and International Development*, *7*(1), 211–219.

20.Mohd Noor, Z., Mohamed Nor, N., and Abdul Ghani, J. (2007). The relationship between output And unemployment in Malaysia: does Okun's Law exist? *International Journal of Economics and Management*, *1*(3), 337–344.

21.Omoke, P. C., and Ugwuanyi, C. U. (2010). Money Price and Output: Causality Test for Nigeria. *American Journal of Scientific Research*, (8), 78–87.

22.Omri, A., and Kahouli, B. (2014). The nexus among foreign investment, domestic capital and economic growth: Empirical evidence from the MENA region. *Research in Economics*, *68*(3), 257–263.

23.Perron, P. (1989). The great crash, the oil price shock, and the unit root hypothesis. *Econometrica: Journal of the Econometric Society*, *57*(6), 1361–1401.

24.Perron, P. (1997). Further evidence on breaking trend functions in macroeconomic variables. *Journal of Econometrics*, *80*(2), 355–385.

25.Ramli, R. (2012). Inflation, Money Supply And Economic Growth: A Causality Analysis For Malaysia. *Malaysia: Department of Statistics*. Retrieved from https://www.statistics.gov.my/portaL_@Old/download_journals/files/2014/Volume1/Inflation_Money_Supply_and_Economic_Growth.pdf

26.Romer, D. (2001). *Advanced macroeconomics* (2nd ed.). Boston: McGraw-Hill.

27.Srinivasan, P., Kalaivani, M., and Ibrahim, P. (2010). FDI and economic growth in the ASEAN countries: Evidence from cointegration approach and causality test. *IUP Journal of Management Research*, *9*(1), 38–63.

28.Tan, B. W., and Tang, C. F. (2011). The dynamic relationship between private domestic investment, the user cost of capital, and economic growth in Malaysia. MPRA Munich Personal RePEc Archive. http://doi.org/10.5897/JAERD12.088

29.Tan, B. W., and Tang, C. F. (2016). Examining the Causal Linkages among Domestic Investment, FDI, Trade, Interest Rate and Economic Growth in ASEAN-5 Countries. *International Journal of Economics and Financial Issues*, *6*(1), 214–220.

30.Zhou, H. (2015). Effectiveness Study of Chinese Monetary Policy Regulation on Economic Growth and Inflation. In *In China's Monetary Policy Regulation and Financial Risk Prevention* (pp. 19–32). Springer Berlin Heidelberg.

31.Zivot, E., and Andrews, D. W. (1992). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business and Economic Statistics*, *10*(3), 251–270.