Post Keynesian Interest Rate Exogeneity: Evidence from Malaysia

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ABSTRACT

In an economy where money supply is endogenous, interest rate serves as the key instrument of monetary policy. The operation of monetary policy through the setting of a key interest rate and not through a money supply target is actually the fundamental tenet of Post Keynesian economics that money supply is endogenous; that interest rate rather than the stock of money should be the focus of monetary policy. While the proposition of money endogeneity (or interest rate exogeneity) is generally accepted by all Post Keynesians, they disagree on one related question: to what extent are interest rates set exogenously by central banks? While this issue has become the focus of debate between the Horizontalists and Structuralists, the ability of a central bank to influence economic activity would depend much on the interaction between official rate and market rates. The major interest of the present paper is to examine this issue of interest rate transmission mechanism based on the Malaysian data. Employing the cointegration and vector error correction model procedures to analyze the data, results of the study indicate that the pass through from the overnight policy rate to two short term market rates is less than complete.

Key Words: Post Keynesian Economics; Horizontalists; Structuralists; Exogeneity

INTRODUCTION

The history of economic thought has witnessed the birth of several theories to explain interest rate – the price of liquidity, the price of credit. Monetarists as well as New Classical economists for example, posit that money supply is exogenous: it is controlled entirely through central bank interventions. Such an assertion is based on the premise that money supply equals the money multiplier times the monetary base. Since the central bank can change this base, it can control the supply of money in the economy: money supply exogeneity and interest rate endogeneity.

The notion of interest rate endogeneity however, is rejected by Post Keynesians. Extending the idea of John Maynard Keynes (Keynes, 1930; 1933; 1936), this group of economists contends that interest rate is determined exogenously rather than endogenously because money supply in a market oriented production economy is endogenous. Post Keynesians have developed an extensive literature arguing that money supply is actually endogenous - "that market forces combine with central banks in establishing the money supply."(Pollin, 2009:244). In an environment of endogenous money, "the rate of interest is exogenous; the monetary authorities set it." (Rochon and Vernengo, 2001:3).

Within the Post Keynesian schema, the role of central bank in managing an economy is fundamental: The role of central bank is "… reduced to the setting of a very short-term official rate of interest, which indicates the price at which it will make liquidity available to the banking system." (Mariscal and Howells, 2002:569). In Moore (2006:250) words, …the Central Bank sets the short-term interest rate and does not directly increase or decrease the money supply by the open market purchases or sales of securities. By altering the level of short-term interest rates, the Central Bank can shape market expectations of the future behaviour of inflation, exchange rates, and the change in Aggregate Demand. In this manner it influences the quantity of credit demanded and the quantity of money created and supplied.

The foregoing discussion suggests that in a world of endogenous money, official interest rate as the chief tool of monetary policy plays a crucial role in managing the economy. Monetary policy decisions and announcements influence expectations about the future course of the economy and the confidence with which these expectations are held. Monetary policy decisions and actions influence each of the four components of the aggregate demand: consumption, investment, government spending and net exports. Economists believe that monetary policy influences economic activity through a variety of channels. The various channels or avenues through which changes in monetary policy alter aggregate demand and economic activity are known collectively as the transmission mechanism of monetary policy (Thomos, 2006).

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Interest rate is one of the widely discussed and actively researched channels of monetary transmission mechanism. The way and the process through which changes in official interest rate are eventually transmitted or communicated to the behaviour of economic activity and nominal income are normally referred to as the interest rate transmission mechanism of monetary policy.

Nonetheless, the ability of central banks to influence aggregate demand depends on the interactions of the official rate with various short- and long-term market rates and on their interactions with the financial and real behaviour of the economy (Moore, 2006). Expressed differently, it is changes in market rates that affect behaviour and hence, the ability of central bank to influence macroeconomic variables would depend on the interaction between official and market rates. Having said this, the present study is planned to answer the following questions:

(i) Does the Post Keynesians hypothesis on interest rate exogenity exist with respect to the Malaysian data; and
(ii) To what extent are changes in the Malaysian monetary policy as reflected by changes in the overnight policy rate (OPR) transmitted to the base lending rate (BLR) and the three month Treasury-bills rate (TBR)?

The remainder of the paper is organized in five sections. We begin in section two by reviewing the literature related to the theory and empirical works on Post Keynesians exogeneity of interest rate. While section three sketches the empirical methods to be employed in the study, section four reports and discusses our empirical findings. As usual, the last section, section five, concludes.

REVIEW OF THE RELATED LITERATURE

Central to Post Keynesian macroeconomic theory or more specifically, monetary theory is that money supply is endogenous. In developing the theory of endogenous money, Post Keynesians have always considered the role of central bank as crucial (Rochon & Rossi, 2007).Since the process of money creation is determined within the economic system rather than in the independent discretionary action of the central bank, this Post Keynesian view is known as endogenous money theory to distinguish it from the exogenous money theory proposed by Monetarist school (see Fontana & Venturino, 2003; Cottrell, 1986).

Monetarists argue that the quantity of money supplied is (should be) exogenous and therefore are a cause of inflation. Post Keynesians following Keynes (1973) on the other hand, believe that changes in the quantity of money is (should be) endogenous and therefore are an effect of changes in the demand for liquidity.

It is interesting to note that while money supply is viewed to be endogenous, the existence of a natural rate of interest is also rejected by Post Keynesians. As Lavoie (1996:281) puts it, “To define the proper foundations of a Post Keynesian monetary analysis, one must thus simultaneously and explicitly adopt an endogenous money approach (with generalized liquidity preference), and discard

the notion of the natural rate hypothesis". By rejecting the natural rate of interest concept Post Keynesians are claiming that rate of interest is exogenous: it is not determined by any market mechanism where demand and supply schedules intersect, but it is exogenously 'administered' (and managed) by the central bank.

The term exogeneity actually have been used in a number of quite different ways by different authors (see Desai, 1989; Wray, 1992; Cooley and LeRoy, 1981). In the literature of Post Keynesian economics, as claimed by Wray (2006), the common use of the term is the control sense. An exogenous variable is then defined as one whose value is set by government policy. Moore (1988) in discussing interest rate exogeneity however, prefer to use the term 'administer' to imply that policy makers change their interest rate target in reaction to economic outcomes and policy goals.

According to Rochon and Rossi (2007), Post Keynesians have always considered the role of the central bank as crucial in developing a theory of endogenous money. Indeed, the Structuralist/Horizontalist debate in the early 1990s focused largely on the appropriate role of the central bank. However, this role is usually limited to one of two functions: either the central bank sets the rate of interest at the short-term end of the spectrum, or it acts as a lender of last resort pumping needed reserves into the banking system to prevent its collapse.

Fontana and Venturino (2003:399) however, describe the debate between Horizontalists and Structuralists in the following words: In particular, there is a long-standing debate between horizontalists and structuralists about the behaviour of the central bank in the monetary reserves market and banks in the credit market. How does a central bank keep the lending activity of banks in check? Does it accommodate any demand for reserves at the going short term interest rate? Similarly, do banks accommodate any demand for credit at the going interest rate? And, related to that, how should the supply curves of monetary reserves and the supply curve of credit be represented?

Empirical works examining the transmission mechanism of monetary policy from the perspective of Post Keynesian monetary economics in general and the response to changes in the central bank rate of short-term market rates in particular, still appear to be relatively few. Atesoglu's (2003-4) work is an interesting study that meets the criteria. In his paper, Atesoglu (2003-4) uses the data from the United States of America (U.S.) to examine the relationship between federal funds rate (policy rate) and prime rate. Breaking the data into two sample periods (i.e., 1987:02 – 1994:01 and 1994:02 – 2002:05), Atesoglu (2003-4) has come up with two findings which lend support for the interest rate channel of monetary transmission process as proposed by the Post Keynesian economics: Based on the first sample period of 1987 through 1994, finding of the study indicates that there is a two-way causality (or bidirectional relationship) between the federal funds rate and the prime rate. However, based on the more recent sample period of 1994 through 2002, the study has detected unidirectional causality – the causality that runs from federal funds rate to the prime rate. Such a result indicates "a pass-through from the federal funds rate to the prime rate."

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In terms of the extent of pass-through, findings of Atesoglu's (2003-4) study indicate that from 1987:02 to 1994:01, there has been less than complete pass-through (0.80) from the federal funds rate to the prime rate. In his subsequent study on long-term interest rate over the post-1987:02 period, Atesoglu (2005) finds incomplete pass-through from the federal funds rate to both the AAA corporate bond rate (0.720) and 30-year U.S. Treasury note rate (0.575) with unidirectional causality from the federal funds rate to each of the long-term interest rates, lending further support for the Horizontalist hypothesis.

Payne (2006-7) in his attempt to differentiate between the Horizontalist' and Structuralist' money supply endogeneity hypotheses as well as answer questions related to interest rate pass-through and corresponding adjustment, extends the works of Atesoglu (2003-4; 2005). His study involves examining the relationship between the U.S. federal funds rate and the fixed mortgage rate. In his paper, Payne (2006-7) reports that there is a unidirectional causality that runs from the federal funds rate to the fixed mortgage rate. Such findings according to the author, lends support for the Horizontalist hypothesis. Additionally the author claims that the extent of incomplete pass-through (0.538) from the federal rate to the fixed mortgage is comparable to the findings of Atesoglu's (2005) study in the case of the 30-year U.S. Treasury note rate (0.575).

As far as the Malaysian data are concerned studies on monetary transmission mechanism in general, has focused more on money and credit channels. Using the Bernanke's (1993) contemporaneous VAR, Azali & Matthews (1999) for instance, investigate the role of money and credit in the monetary transmission mechanism during the pre- and post-liberalization periods in Malaysia. During the pre-liberalization period where credit and interest rates were regulated, the evidence supports the dominance of bank credit shocks over money shocks in explaining the output variability. After the liberalization of financial market however, money as well as credit innovations were proven to make significant contribution to output fluctuations.

Scholnick (1991) and Tan (1995) in testing a disequilibrium model of lending rate determination, also use the Malaysian data. Both studies employed the Stiglitz and Weiss's (1981) base-line model. Using the error-correction mechanism specification, Scholnick's (1991) study shows that the lending rates do not fully clear the loan market. This indicates that the presence of the credit rationing was due the slow adjustment of the loan rate. Similar evidence has also been portrayed by Tan (1995).

On the other hand, Noor Azlan & Aisyah (2005) investigate the link between banking activities and macroeconomic performance in Malaysia with respect to the money and credit channel by studying the causal influence of banks' assets and liabilities. The Granger causality analyses that they performed support the importance of credit channel within the Malaysia economy.

Salina (2006) investigates the importance of bank lending in the monetary transmission process in Malaysia over the period of September 1998 to December 2003. Using the multivariate causality analysis based on the VECM and the Toda-

Yamamoto model, the study finds that the overnight policy rate (OPR) is the best policy indicator for Malaysia in the post-crisis period (that is, after the Asian Financial Crisis of 1997/98).

Lastly, while Payne (2006-7) extends the works of Atesoglu (2003-4; 2005), the present study extends the work of Payne (2006-7) by examining almost the same issues as examined by Payne but based on the Malaysian data. Our study also can be considered as an extension of Salina's (2006) work because she has found that the OPR is the best policy indicator for Malaysia.

EMPIRICAL METHOD

In this study, the relationships between the variables of our interest are examined by employing the Johansen Cointegration as well as the Vector Error Correction Model (VECM) procedures. Results of our analysis might be interesting given the fact that Malaysia is a relatively small and rapidly developing economy. Further, cointegration method is employed in order to detect for the presence of long run equilibrium and cointegration among non-stationary data series. If the variables are cointegrated then regression analysis will be a meaningful approach in analyzing the data because it would provide more reliable information about long-run relationships.

The stationary linear combination (of variables) is normally referred in the literature as the cointegrating equation. Such a phenomenon may be interpreted as a long-run equilibrium relationship among the variables. When there is a long run relationship (or cointegration) between variables, then the next step is to examine the direction of causality between these variables. The procedure widely used by researchers in detecting for the direction of causality is vector error correction model.

A vector error correction model (VECM) is a restricted VAR model, designed for use with non-stationary series that are known to be cointegrated. Under the VECM model, the cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. As noted above, analysis with error-correction modeling technique of the dynamically stable adjustment process, implied by cointegration relationship, is considered useful because it will lead us towards identifying the direction of causality between variables. In this case, the size of the error correction term indicates the speed of adjustment of any disequilibrium towards a long-run equilibrium state.

It is worth noting here that this Johansen approach to data analysis has two strengths over Ordinary Least Square (OLS) method: Firstly, the VECM data analysis will enable us to identify the direction of causality between the variables of our interest. Such a finding will lead us towards identifying which sub-school of Post Keynesian economics does our evidence support; and secondly the absolute value of error correction term coefficient provides a measure of the average speed at which variables adjust to a change in equilibrium conditions (see Atesoglu,

2003-4, 2005). Such knowledge is considered useful in examining the efficiency of Malaysian monetary policy (tools), as compared those of the well establish economies.

The relationship between the overnight policy rate (OPR) rate and the base lending rate (BLR) is to be analyzed by employing the cointegration and vector error correction modeling techniques of Johansen, based on the following equations:

$$BLR = f(OPR) \tag{1}$$

$$BLR = \beta_0 + \beta_1(OPR) + \mu \tag{2}$$

$$\Delta BLR = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta BLR_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta OPR_{t-i} + \beta_{3i} EC_{t-1} + \varepsilon_t \tag{3}$$

The presence of a long run relationship between the dependent and explanatory variables would suggest the existence of a cointegrating regression between them. More precisely, cointegrating regression attempts to fit a long run relationship among those variables which have the same order of integration. The residuals from the cointegrating regression can be represented as error correction term (ECt-1) to explain the short run dynamics in Vector Error Correction Model (VAR). Data analysis based on error correction modeling techniques of the dynamically stable adjustment process implied by the cointegration relation, will enable us to identify the direction of causality between these variables.

Any change in the OPR initiated by the central bank will be transmitted to the commercial bank through the base lending rate. This seems to suggest that interest rate is an exogenous variable. It is perhaps based on this premise that Atesoglu (2003) utilized the concept of interest rate channel of monetary transmission to prove the endogeneity of money supply in the U.S. Following Atesoglu's (2003) approach, in the present study the Malaysian data are used to examine the tendency of the OPR to influence the behavior of the BLR as well as the TBR (see also Vera, 2001).

After examining the relationship between the OPR and the BLR, our study is extended to examining the relation between the OPR and the three months T-bills rate (TBR). Employing the same Johansen procedure as discussed above, the OPR–TBR relationship is specified as follows:

$$TBR = f(OPR) \tag{4}$$

$$TBR = \beta_0 + \beta_1(OPR) + \mu \tag{5}$$

$$\Delta TBR = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta TBR_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta OPR_{t-i} + \beta_{3i} EC_{t-1} + \varepsilon_t \tag{6}$$

EMPIRICAL FINDINGS

The results of our data analyses based on the Johansen cointegration and VECM techniques are displayed in Table 1. These findings are briefly interpreted in the following points: First, there is a positive and significant cointegration relation between the overnight policy rate and the base lending rate. The value of cointegration coefficient of 0.6696 indicates that there has been more than half pass-through from the overnight policy rate to the base lending rate. Secondly, as shown in column 5, the error correction term is a significant determinant of the change in base lending rate (i.e., ∆BLR = -3.4443), but not of the change in the overnight policy rate (i.e., ΔOPR = -0.1632). Parallel with Atesoglu's (2003) findings, these results indicate that, while the BLR adjusts in maintaining the cointegration relation, the OPR does not. This implies the presence of unidirectional causality that runs from the overnight policy rate to the base lending rate during the 1996-2013 sample periods. Thirdly, the estimated error correction term for ΔBLR (-0.2513) indicates that about 25 percent of the adjustment in the BLR is completed within one month after the change in the OPR. (For comparison, note that for the U.S. economy in 2003 the value of adjustment is about 77%). Further data analysis using the Johansen procedure provides stronger evidence for cointegration between overnight policy rate and T-Bills rate. This is displayed in Table 2 and could be briefly interpreted as follows: First, Johansen results indicate that OPR and TBR rate are significantly cointegrated. Their relationship is positive, empirically stable and long-run in nature. Secondly, the value of cointegration coefficient is around 0.7, indicating that, in the long run, the pass-through from the OPR to the TBR is more than half (or more precisely 73%). Thirdly, results from the VECM as noted in column six (table 2) reveal that the change in TBR is significant (i.e., ΔTBR = -9.5621), whereas the change in overnight policy rate is not (i.e., ΔOPR = -0.7320). This implies that the relationship between the OPR and the TBR is unidirectional, running from the OPR to the TBR (OPR → TBR). Lastly, it is interesting to note that the estimated error correction term for ΔTBR is -0.8817, revealing that about 88 percent of the adjustment in the TBR is completed within one month after the change in the OPR.

CONCLUSIONS

In a world of endogenous money, interest rate, being an exogenous variable, plays a key role in managing the economy. Today, for most central banks, official short-term interest rate has become the sole instrument of monetary policy. Thus, the impact of changes in official interest rate on the market rates which in turn will (actually) affect the behavior of economic activity and nominal income should be an issue of concern for many parties.

The present paper explores the Malaysian interest rate channel of monetary transmission mechanism. Utilizing the Johansen cointegration and vector error correction procedures, it investigates the relationships between the overnight policy rate (OPR) and two short-term market rates – the base lending rate

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(BLR) and the three-month Treasury bills rate (TBR). In addition to testing the Post Keynesians interest rate exogeneity hypotheses, the paper attempts to answer questions related to the Malaysian interest-rate pass-through and the corresponding adjustment process.

Findings of the study are summarized as follows: First, the evidence of unidirectional causality from the OPR to the BLR as well as the TBR, lends support for the horizontalist (Post Keynesians) view of interest rate exogeneity. Such a finding provides further confirmation of the results provided by Atesoglu (2003-4; 2005) as well as Payne (2006-7). Secondly, the extents of pass-through respectively, from the OPR to the BLR and from the OPR to the TBR are 67% and 73%. In Atesoglu's (2003-4) study for the U.S. data the pass-through from the federal funds rate to the prime rate is 80%. Lastly, only about 25% of the adjustment in the BLR is completed within one month after the change in the OPR. For the U.S. data, Atesoglu's (2003-4) study indicates that the value of adjustment is about 77%. The relatively higher percentage of adjustment detected by Atesoglu (2003-4) as compared to our findings based on the Malaysian data might be explained by the fact that the monetary system of a more advanced economy such as the U.S. is more efficient than that of the Malaysian.

It is worth noting at this juncture that, while exogeneity/endogeneity issue of interest rate has some policy implications (see Davidson, 1988), three issues raised by Pollin (2009:249) might be interesting for policy makers as well as futures researchers: Firstly, "…The policy implications that flow from the idea that Federal Reserve's control over market rates are determined with a high degree of endogeneity as an outcome of financial market operations". Secondly, "By definition, financial deregulation enhances the autonomy of market forces and thereby weakens the Federal Reserve's power to exogenously set interest rates independent of market forces". Thirdly, "… if the Federal Reserve now operates with limited power to exogenously set interest rates via their control over the Federal funds rate, the aim should therefore be to incorporate additional policy tools that can increase interest rate exogeneity.".

Table 1
OPR and BLR: Results of Johansen Estimates (VECM)

Sample period	Intercept	OPR	R^2	Error Correction Term
Johansen 1996:1- 2013:12	4.3166	0.6696 (0.0305) [21.9471]		
ΔOPR				-0.0169 (-0.1632)
ΔBLR				-0.2513 (-3.4443)
Notes: OPR is the overnight policy rate (right-hand side variable) and BLR is the base lending rate (left hand side variable). The Johansen cointegration tests assume no linear deterministic trend, lag interval (in first differences): 1 to 1. The trace tests indicate one cointegration equation at the 5 percent level. Values in ( ) denotes standard errors and values in [ ] denotes t- statistics				
Results of Diagnostic Tests n = 216 R^2 = 0.9624 Adjusted R^2 = 0.9622 DW (et) = 0.4758 DW (ut) = 2.0766 JB = 29.5337 (0.0000) BP (λ^2) = 8.6025	JB is Jarque-Bera test for normality BP is Breusch-Pagan test for heteroskedasticity DW is Durbin Watson test for autocorrelation			

Notes:
In testing for Integration (Unit Root Test), three unit root tests are utilized: Phillips-Perron (PP), Augmented Dicky-Fuller (ADF) and Kwiatkowski, Phillips, Schmidt, and Shin's (KPSS) test. All variables are stationary at first difference. Results indicate that all variables of interest in this study are integrated of order one, I(1). For details see Appendix (i.e., Tables A, B and C).

Table 2
OPR and TBR: Results of Johansen Estimates (VECM)

Technique (Method)	Dependent variable	Intercept	OPR	R^2	Error Correction Term (ECT)
Johansen 1998:1- 2013:12	T-Bills	0.4815	0.7338 (0.0151) [48.6016]		
	Δ OPR				- 0.0678 [-0.7320]
	Δ TBR				-0.8817 [-9.5621]
Notes: OPR is the overnight policy rate (right-hand side variable) and T-Bills is the Treasury Bills Rate (left hand side variable). The Johansen cointegration tests assume no linear deterministic trend, lag interval (in first differences): 1 to 1. The trace tests indicate one cointegration equation at the 5 percent level. Values in ( ) denotes standard errors and values in [ ] denotes t- statistics					
Results of Diagnostic Tests n = 192 R^2 = 0.8819 Adjusted R^2 = 0.8810 DW (et) = 0.6958 DW (ut) = 1.6056 JB = 32.7319 (0.0000) BP (λ^2) = 6.2267	JB is Jarque-Bera test for normality BP is Breusch-Pagan test for heteroskedasticity DW is Durbin Watson test for autocorrelation				

APPENDIX: UNIT ROOT TEST

Table A

APPENDIX: UNIT ROOT TEST

Table A
Stationary Results Based on Phillips-Perron (PP) Test

	Level		First differences	
variable	Without trend	With trend	Without trend	With trend
BLR	- 1.3286	- 2.4320	- 7.7488*	- 7.7131*
OPR	- 1.3507	- 1.7866	- 7.0029*	- 6.9831*
TBR	- 2.3064	- 1.7931	- 6.5569*	- 7.9520*
* denotes rejection of a unit root hypothesis based on Mackinnon's critical value at 1%.				

Table B
Stationary Results Based on ADF Test

	Level		First Differences	
Variable	Without Trend	With Trend	Without Trend	With Trend
BLR	- 1.6321 (2)	- 2.6672 (2)	- 7.6705* (0)	- 7.6335* (0)
OPR	- 1.4131 (1)	- 1.8086 (1)	- 6.9473* (0)	- 6.9288* (0)
TBR	- 2.0483 (0)	- 1.7557 (0)	- 6.9923* (0)	- 7.0113* (0)
* denotes rejection of a unit root hypothesis based on Mackinnon's critical value at 1%. In the parentheses are the number of lags.				

Table C
Stationary Results Based on KPSS Test

	Level		First Differences	
Variable	Without Trend	With Trend	Without Trend	With Trend
BLR	0.9461*	0.1168*	0.0769	0.0775
OPR	0.8936*	0.1527*	0.0921	0.0780
TBR	3.8445*	1.3308*	0.1511	0.0598
* denotes rejection of a unit root hypothesis based on MacKinnon's critical value at 1%				

REFERENCES

Arestis, P. (1992). The Post Keynesian Approach to Economics: An alternative analysis of economic theory and policy. London: Edward Elgar.

Atesoglu, H.S. (2003-4).'Monetary Transmission – Federal Funds Rate and Prime Rate.'Journal of Post Keynesian Economics, 26(2), 357-362.

Atesoglu, H.S. (2005). 'Monetary Policy and Long-Term Interest Rates.' Journal of Post Keynesian Economics, 27(3), 533-539.

Azali, M. & Matthews, K.G.P. (1999). 'Money-Income Relationships during the pre- and The Post-Liberalization periods: evidence from Malaysia.' Applied Economics, 31, 1161-1170.

Bank Negara Malaysia (1999) The Central Bank and the Financial System in Malaysia: Decade of Change (Kuala Lumpur: Bank Negara Malaysia).

Bank Negara Malaysia (Various Issues) Annual Report (Kuala Lumpur: Bank Negara Malaysia).

Bank Negara Malaysia (Various Issues) Monthly Statistical Bulletin (Kuala Lumpur: Bank Negara Malaysia).

Bank Negara Malaysia (Various Issues) Quarterly Bulletin (Kuala Lumpur: Bank Negara Malaysia).

Bernanke,B. (1993). Credit in the macroeconomy. Quarterly Review, Federal Reserve Bank of New York. 18: 50-70.

Borio, C.E.V. (1997). ' Monetary Policy Operating Procedures in Industrial Countries.' Bank for International Settlements, Working Paper No. 40, Basel, Switzerland.

Britton, E. & Whitley, J. (1997). 'Comparing the Monetary Transmission Mechanism in France, Germany and the United Kingdom: Some Issues and Results.' Bank of England Quarterly Bulletin, 37(2), 152-162.

Cooley, T. & S. LeRoy (1981). ' Identification and Estimation of Money Demand.' The American Economic Review, 71, 825-844.

Cottrell, A. (1986). The Endogeneity of Money and Money-Income Causality. Scottish Journal of Political Economy, 33, 2-27.

Dale, S. (1993). ‘ Effects of changes in Official UK Rate upon Money Market Rates since 1987.’ Manchester School, Proceedings of the Money, Macroeconomics and Finance Research Group, 76-94.

Desai,M. (1989). ‘Endogenous and Exogenous Money’, in John Eatwell, Murray Milgate and Peter Newman (eds), The New Palgrave: Money, New York and London: W.W. Norton.

Enders, W. (1995). Applied Econometric Time Series. New York: John Wiley & Sons.

Engle,R.F.,&Granger,C.W.J. (1987). ‘Cointegration and Error Correction:Representation, Estimation, and Testing.’ Econometrica, 55(2), 251-276.

Fontana, G. & Venturino, E. (2003), ‘Endogenous Money: An Analytical Approach.’ Scottish Journal of Political Economy, 50(4), 398-416.

Harris, L. (1985). Monetary Theory. New York: McGraw-Hills Inc.

Heffernan, S.A. (1997). ‘Modelling British Interest Rate Adjustment: An Error Correction Approach.’ Economica, 64(254), 291-231.

Keynes, J.M. (1973). The Collected Writings of John Maynard Keynes, vol. 13 & 14, London: Macmillan.

Lavoie, M. (1992). ‘Jacques Le Bourva’s Theory of Endogenous Credit-Money.’ Review of Political Economy, 4(4), 436-446.

Lavoie, M. (1996). ‘Horizontalism, Structuralism, Liquidity Preference and the Principle of Increasing Risk.’ Scottish Journal of Political Economy, 43, 275-300.

Maddala, G.S. (2001). Introduction to Econometrics, 3rd edition, John Wiley and Sons, Chichester.

Mariscal, I.B. & Howells, P. (2002). ‘Central Banks and Market Interest Rates.’ Journal of Post Keynesian Economics, 24(4), 569-585.

Mishkin, F.S. (2010). The Economics of Money, Banking, and Financial Markets. New York: Addison-Wesley.

Moore, B.J. (1988). ‘The Endogenous Money Supply.’ Journal of Post Keynesian Economics, 10(3), 372-385.

Moore, B.J. (2006). 'Shaking the Invisible Hand: Complexity, Endogenous Money and Exogenous Interest Rates' NewYork: Palgrave Macmillan.

Noor Azlan, & Aisyah (2005).' The Transmission Mechanism of Monetary Policy in Malaysia: Through Bank Loans or Deposit?' Journal of Economics and Management, 13(1), 20-32.

Palley,T.I.(1991).'The Endogenous Money Supply: Consensus and Disagreement.' Journal of Post Keynesian Economics, 13(3), 397-403.

Payne, J.E. (2006-7). 'More on the Monetary Transmission Mechanism: Mortgages Rates and the Federal Funds Rate.' Journal of Post Keynesian Economics, 29(2), 247-257.

Pollin, R. (2009). 'Interest rate exogeneity: Theory, evidence and policy issues for the U.S. Economy' Ekonomiaz, 72(3), 244-268.

Rochon, L.P. (2001). 'Cambridge's Contribution to Endogenous Money: Robinson and Kahn on credit and money'. Review of Political Economy, 13(3), 287-307.

Rochon,L.P.&Rossi, S. (2007).'Central Banking and Post-Keynesian Economics.'Review of Political Economy, 19(4), 539-554.

Rochon, L.P. and Vernengo, M. (2001). "Introduction" in Rochon, L.P. and Vernengo, M. (eds.), Credit, Interest Rates, and the Open Economy: Essays on Horizontalism,: Edward Elgar, Northamton, MA:1-10.

Salina, K. (2006). 'Bank Lending and the Transmission of Monetary Policy in Malaysia.'Unpublished PhD Thesis, International Islamic University, Malaysia.

Scholnick, B. (1991). 'Testing a disequilibrium model of lending rate determination: the case of Malaysia.' International Monetary Fund Working Paper: WP/91/84.

Stiglitz,J.E.&Weiss.A.(1981).'Credit rationing in markets with imperfect information.' The American Economic Review, 71(3), 393-410.

Thomos L.B., (1997), Money, Banking and Financial Markets. New York: McGraw-Hill Companies, Inc.

Tan, E.C. (1995). ‘Money demand, bank credit and real exchange rates in a small open

developing Economy: an econometric analysis for Malaysia.’ Unpublished PhD Thesis, University of Warwick,UK.

Vera, A. P. (2001). ‘The Endogenous Money Hypothesis: Some Evidence from Spain (1987-1998).’ Journal of Post Keynesian Economics, 23(3), 509-526.

Wooldridge, J. M. (2003). Introductory Econometrics. New York: Thomson.

Wray, L. R. (1992). ‘Alternative Approaches to Money and Interest Rates.’ Journal of Economic Issues, 24, 1145-1178.

Wray, L. R. (2006). ‘When are interest rates exogenous?’ In Mark Setterfield, Complexity, Endogenous Money and Macroeconomic Theory, Edward Elgar.