MONEY BALANCES, ECONOMIC ACTIVITIES AND SELECTIVE CAPITAL CONTROLS IN MALAYSIA

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Abstract

This paper reports results of a test of money demand and supply as predicted by recent studies applied to small economies with greater openness to external factors. These results suggest that the short- and long-run money balances are determined by both the interest rate policies as well as the price levels in the economy. With open conditions generally prevailing in our tested small economy, increases in interest rates attract portfolio funds, which helped to spur asset price bubble to build up. When the economy came under strain as a result, the bubble bursts as happened at the time of the Asian financial crisis, which led to a severe currency crisis that lasted for about 18 months, causing severe economic downturns thereafter. The findings may be taken to mean that control of short-run portfolio flow is critical in a more open small economy.

JEL Classification: E51
Key words: Money demand, Portfolio funds, Interest rates, Narrow money, short- and long-run effects, Monetary regulation

1. Introduction

Money demand and supply have been examined both conceptually and empirically mostly in the developed economies: see for example Bhattacharya (1995) and Cesarano (1994; 1998; 1999). Bhattacharya reviewed the literature relating to the advanced economies and compared the results across them. Cesarano reviewed early literature in the advanced European economies from the early 20th Century. Sriram (2001) reviewed related key studies and helped to develop model estimation methods: he concluded that cointegration model is superior to Buffer Stock Model (BSM) in explaining the short- and long-term relationships of money balances in open economies.[1]

Among earlier empirical studies on money balances are several key papers: Friedman (1959), Chow (1966), Laidler (1985), Metwally and Abdel Rahman (1990), Friedman and Kutter (1992), Masih and Masih (1998), Civcir and Parikh (1998), Oben (1998) and Khamis and Leone (1999). A few of them focused on developing economies, particularly in the Southeast Asian countries. One of that covered Malaysia, Singapore, Thailand and the Philippines: see Masih and Masih (1998). They found significant evidence to conclude that money causes the price level to change. Civcir and Parikh (1998) measured the long- and short-run relationships and the elasticities of narrow and broad money: they concluded that money balances can be simultaneously explained. Oben (1998) which is a replication of Civcir andParikh's (1998) framework reported that narrow money is more responsive than broad money to changes in real income and interest rates in Brunei.

The principle objective of this paper is to discuss the long- and short-run narrow money balances along the line of inquiry of Civcir and Parikh and Oben for the Malaysia's case, which is a small open economy.[2] The structure of the rest of the paper is as follows. The next Section describes the monetary framework of the theoretical equilibrium condition of money balances. Section 3 describes the data set and the test models. Section 4 includes the test results and a discussion of the findings. Finally in Section 5, we draw relevant conclusions that may be useful for the conduct of monetary policy formulation.

2. The short- and long-run equilibrium in money balances

Civcir and Parikh (1998) formulated a relationship between money demand, money supply and external flow of reserves, using the basic framework of the monetary approach as:

$$\text{Ln } M^{rb}_t = \beta_0 + \beta_1 \text{ Ln } k_t + \beta_2 \text{ Ln } Y_t + \beta_3 \text{ Ln } \pi_t + \beta_4 \text{ Ln } P_t + \beta_5 \text{ Ln } Pg_t \quad (1)$$

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[1] See Sriram (2001) for detailed discussion. A Buffer Stock Model (BSM) is fundamentally a structural model. On the other hand, a cointegration model is basically a advanced quantitative model.

[2] Sriram (2001) explained that if any shock that causes disequilibrium, there exist a well-defined short-term dynamic adjustment process such as error correction mechanism that will push back the system towards the long-run equilibrium, hence cointegration holds. Thus, this paper attempts to employ both approaches of Cointegration Analyses: Unrestricted Vector Autoregressive (VAR) and Error Correction Model (ECM).

[3] Where (Ln) Natural Log, (M^{rb}) Real money balances, (k) Interest rate, (y) Real Income, (p) Inflation, (P) Price level, (Pg), Real gold price, (t) time period, (RGDP) Real gross domestic product, (EXTPLAC) the proportion of the total assets of commercial banks in foreign money markets, and (RNOR) the real net official Malaysia s foreign reserve

The definitions of the variables are given in the footnote. Obben (1998) used a similar monetary framework to specify the real money balances as:

$$\text{Ln } M^{rb}_t = \beta_0 + \beta_1 \text{ Ln } k_t + \beta_2 \text{ Ln RGDP}_t + \beta_3 \text{ Ln } \pi_t + \beta_4 \text{ Ln } P_t + \beta_5 \text{ Ln EXTPLAC}_t \quad (2)$$

This study attempts to specify the model as follows:

$$\text{Ln } M^{rb}_t = \beta_0 + \beta_1 \text{ Ln } k_t^{(-)} + \beta_2 \text{ Ln RGDP}_t^{(+)} + \beta_3 \text{ Ln CPI}_t^{(+)} + \beta_4 \text{ Ln RNOR}_t^{(+/-)} \quad (3)$$

where, M is a defined measure of money; k is the capital; RGDP is the real gross domestic product; CPI is the consumer price index; RNOR is the real foreign reserve; and EXTPLAC is the proportion of bank assets in foreign market. The superscripted parenthesis signs, as noted in Equation 3, are the expected signs of the coefficients for the relevant variables in the cointegration according to Civcir and Parikh (1998).

Theoretically, as interest rates increase, holding cash balances becomes less attractive. People prefer to invest their excess funds to earn additional income, hence demand for money balances decreases. Thus, the relationship between interest rate and money balances is expected to have a negative sign. As the gross domestic product increases, the per capita income increases, thus triggering an increase in demand for money, especially for transaction purposes. The relationship between money balances and interest rates is expected to be negative while the relationship between money and income is expected to be positive. An increase in inflation due to an increase in price level leads to an increase in money balance. Thus, expected inflation and price level are both expected to be positive: see Obben (1998). It is in contrast with net official foreign reserve that one can postulate either take a positive or a negative sign. If the domestic money supply in the economy decreases, it is a natural phenomenon for the government, businessmen, as well as financial institutions to repatriate their reserves from overseas. Therefore, the sign for net official foreign reserve can take a positive or a negative sign. For a formal development of the models, the readers may refer to the original articles cited in this section.

3. The data and test models

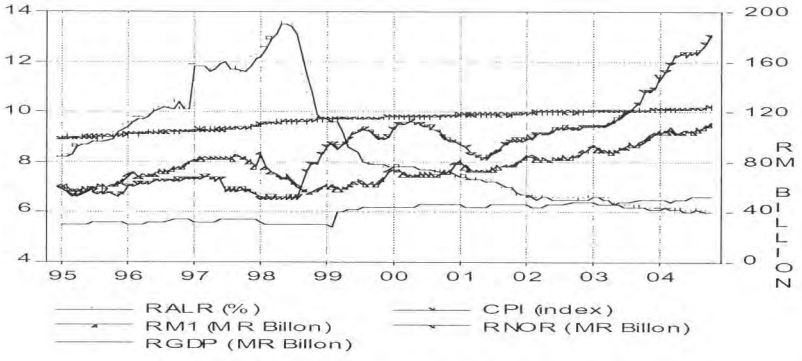
The monthly time series of the relevant Malaysian data from January 1995 to October 2004 were compiled from authoritative sources.[4] It is normal to observe

[4] Monthly and Quarterly Bulletins of Statistics (MBS): Bank Negara Malaysia (BNM), and International Financial Statistics (IFS): International Monetary Fund (IMF).

that the data differ across sources. If there was any discrepancy between the above two major authoritative sources, the data extracted from BNM are selected since published data of IFS were originally obtained from BNM. However, if the discrepancy exists between the various issues of MBS from BNM themselves, the revised or updated version is used.[5]

The statistical behaviour of relevant variables is presented in Figure 1:

Figure 1: Descriptive Statistics of The Relevan Variables



It is evident from the plots of the variables used in this study that the variables have some trends. Thus, there is need to test for stationarity.

4. Findings and discussion

A: Unit Roots

The unit root test results are from testing selected variables using Dickey Fuller (DF), Augmented Dickey Fuller (ADF) and Phillips-Perron (PP). The statistical results, which are not shown, suggested the existence of unit roots for all variables and they are stationary on their first difference I(1). Hence their use in the empirical models were subjected to the usual rigor before inclusion in the test.

B: Long-run relationship of real money balances

The results that follow are from Johansen Multivariate Cointegration analysis using the variables discussed in Section 3. Some significant cointegration results were found and are presented in Table 1.

First, there was a negative relationship between market interest rates and money balances during the pre-intervention period. An increase in interest rate encourages

[5] Care was exercised to avoid possible human error. Each selected variable was graphed to identify spikes indicative of errors so the necessary correction could be made. For instance, the average commercial bank lending rate (ALR) was converted to real average lending rate (RALR) using the conventional Fisher's equation. The rest of the data were converted to real value using CPI. These data were subsequently logged using E-view statistical package.

Table 1: Cointegration test results for long-run real money balances

	Pre-intervention Period:	*Post-intervention Period:*	*Study Period:*	
$LnRM^{rb}_t$	1995:01	1995:01	1998:09	1995:01
1997:06	1998:09	2004:10	2004:10	
Constant	-6.148	0.822	-	29.306
Ln $RALR_t$	-0.767*	-0.496***	0.781*	1.412***
	(0.121)	(0.256)	(0.052)	(0.741)
	[6.339]	[1.938]	[15.019]	[1.916]
Ln $RGDP_t$	1.534*	-1.961*	0.102	7.680*
(0.274)	(0.286)	(0.086)	(3.200)	
	[5.631]	[6.857]	[1.186]	[2.400]
Ln CPI_t	0.536	0.670	-1.002*	-12.477**
(0.895)	(1.098)	(0.080)	(5.279)	
	[0.599]	[0.610]	[12.525]	[2.364]
Ln $RNOR_t$	-0.983*	-0.057	-0.277*	-1.242**
(0.147)	(0.132)	(0.033)	(0.540)	
	[6.687]	[0.043]	[8.390]	[2.300]
Log Likelihood	481.1	594.9	1098.9	1518.2
Lag Interval	1 to 2	1 to 2	1 to 3	1 to 3
Observations:	**27**	**42**	**74**	**114**

Notes: *The AFC period (1997:06-1998:09) cannot be tested due to insufficient data.*
Test assumption assumes that the relationship is linear and has deterministic trend. This is based on the graphs shown earlier. The data is expected to be normally distributed due to a large time series (Nevertheless, they were tested for their normal distribution).
The selection of the model was based on the rank provided by the cointegration's summary. Subsequently, the final model was selected based on Log Likelihood (LR) ratio.
The adjusted R square, Durbin-Watson distribution, t statistics and standard error of regression ***are not provided*** by the normalised cointegration vector.
The data in ( ) is the coefficient standard error, while the data in [ ] is the t statistic. T statistics are calculated. T statistic is simply the coefficent divided by the standard error.
*, **, and *** refer to 1, 5 and 10% significant level, respectively.

the local public, as well as foreign investors and speculators, to invest their funds within domestic financial institutions. The condition changed accordingly after September 1998, when the market interest rates were gradually reduced to stem the portfolio flow and help decrease the excessive international portfolio fund from the domestic market. The relationship between interest rates and money balances, after the intervention, turned positive as expected. Therefore, the results firmly indicate that the conventional procedure to reduce the amount of money balances in the market, using mainly interest rates in the small open market economy does not really work. The measure actually triggers more liquidity as more hot money or portfolio fund inflow occurs into the financial system.[6]

[6] The conventional monetary theoretical framework is not always applicable to all economic situations or market environments. The concept of relying on a direct relationship between money balances and interest rate alone does not work in the real world. There are other dimensions or economic variables besides interest rates that must be considered in managing the economic and business environments.

A second significant point is the overall positive and significant long-term relationship between real GDP and real money balances. The policy implication is that Malaysia (or for that matter, any small open economy) needs foreign direct investment funds to support its GDP and its economic expansion. It does not need portfolio money for speculative purposes because such external funds merely lead to assets bubble being formed causing a negative impact on the stability of the economy, resulting for example in the 1997-8 Asian financial crisis: this is suggested by Krugman (1999) as well.[7]

The third point is that there was a positive relationship between commodity price level and money balances prior to intervention and a negative relationship after the intervention. This condition may possibly be due to the lesson learnt after management of the crisis.[8]

The long-term negative relationship between the net official foreign reserves and money balances is in line with the theoretical framework. The government, businessmen, and individuals are expected to repatriate their overseas' reserves into the country when they have shortages in money balances. These entities are expected to invest overseas when they have excess money. In simple terms, when the money balance in the domestic economy decreases, the amount of net official foreign reserve increases because owners of the fund accumulated their excess fund overseas and thus increased the total of international reserves. The reverse also holds true.

C: Short-run relationship of real money balances

The VAR (vector autoregressive) model is a multiple time series generalisation of the AR model. Having said that, the unrestricted VAR using "E-views" was employed to test the short-run real money balances in the Malaysian economy. The same sets of data employed earlier for long-run relationship were used.

The statistical results presented in Table 2 reveal that the short-run relationship of real money balance models employed in this study were appropriately specified.The selection of statistical results as presented in Table 3 was obtained based on the maximum likelihood value and the minimum value of Akaike Information Criteria. As indicated by the high adjusted R square and F value statistics, the model fit is sufficient. The high coefficient of determination for all specifications led the researcher to conclude that the data are normally distributed.

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[7] It should be noted that there was a negative relationship between real money balances and GDP for the sub-period 1995:01 to 1998:09. According to "Balassa-Samuelson effect", a larger increase in service sector as compared to production sector will lead to a decrease in real GDP over the period (Tzanninis, 1999).

[8] Since Malaysia's independence in 1957, its monetary authority was successful in rewarding the public a steady low inflation of under 6% per annum. However, due to the impact of the crisis, the value of currency declined.

Table 2: Short-run relationship of real money balances: LnRM1

Pre-intervention Period:	*Post Intervention Period:*		*Study Period:*	
1995:01	1995:01	1998:09	1995:01	
$LnRM^{rb}_t$	1997:06	1998:09	2004:10	2004:10
Constant	-10.362**	4.882	-4.997	1.677*
	(4.860)	(3.226)	(3.563)	(0.393)
	[2.132]	[1.513]	[1.403]	[4.259]
$LnRM1_{t-1}$	0.546*	0.740*	0.709*	0.948*
	(0.195)	(0.107)	(0.088)	(0.022)
	[2.802]	[6.895]	[8.060]	[42.700]
Ln $RALR_{t-1}$	0.012	0.284	-0.016	-0.015
	(0.129)	(0.191)	(0.090)	(0.028)
	[0.093]	[1.486]	[0.173]	[0.531]
Ln $RGDP_{t-1}$	0.152	0.385**	0.076	0.095**
	(0.144)	(0.176)	(0.057)	(0.047)
	[1.058]	[2.187]	[1.338]	[2.022]
Ln CPI_{t-1}	2.718**	-1.357	1.208	-0.404*
	(1.301)	(0.738)	(0.751)	(0.104)
	[2.089]	[1.838]	[1.609]	[3.888]
$LnRNOR_{t-1}$	0.209	0.130	0.042	0.031
	(0.126)	(0.095)	(0.025)	(0.024)
	[1.656]	[1.370]	[1.723]	[1.308]
$Resid_{t-1}$	0.341*	0.148	0.029	0.028
	(0.122)	(0.168)	(0.073)	(0.073)
	[2.803]	[0.881]	[0.399]	[0.383]
Adj. sted ^2R	0.971	0.914	0.974	0.954
Se	0.018	0.036	0.026	0.032
F Value	148.3	73.2	459.2	400.1
L/Likelihood	73.9	83.6	167.5	237.4
Akaike AIC	-4.955	-3.649	-4.338	-4.007
Schwarz's SC	**-4.619**	**-3.359**	**-4.120**	**-3.840**
Observations:	27	42	74	115

Notes: Test assumption is linear deterministic trend.
The data in ( ) is the standard error, while the data in [ ] is the t statistic.
*, **, and *** refer to 1, 5 and 10% significant level, respectively.

The first significant finding is that the time series data of money balances suggests that its $LnRM1_t$ short run relationship is highly autoregressive. As expected, the Error Correction Model (ECM) procedure provides less appealing results owing to autocorelation. This is shown by the high *t* statistics (the level of significant of the coeficient of the lagged dependent variables) for $LnRM1_{t-1}$. Therefore, ECM results are not shown here because of the spurious results. Only the Vector Autoregression (VAR) procedure was employed and the results presented in Table 2. Secondly, short-term narrow (M1) money balance does not

significantly influence domestic GDP and commodity price level after the selective capital controls came into force after the crisis in October, 1998. Finally, the impact of real money balances on net official international reserve (NOR) is insignificant in the short-run. The finding is similar to Civcir and Parikh (1998).

5. Conclusions

The empirical findings of this paper may be useful, particularly to the monetary authority in reviewing its existing policy for managing its liquidity position. It is also pertinent to learn of the underlying forces driving money demand in a small economy, especially in the wake of liberalization moves that will render some of the traditional tools of monetary policy invalid after 2003 given the further liberalization by the WTO rules coming into force by 2010.

The results suggest that an increase in domestic interest rates provides little impact to the domestic money balances and liquidity positions. In fact it destabilizes the financial system, owing to the more open economic condition in this economy from years of carefully implemented trade and other liberalization policies. An increase in interest rate in isolation merely invites an influx of hot currency or portfolio funds from overseas, producing asset bubble to build in the economy. Such a bubble preceded the Asian financial crisis as strongly argued by Brash (1998), Krugman (1999) and Mahathir (1999). Our findings suggest that the level of net official international reserves is responsive to narrow money. The results signify that an adequate supply of narrow money is essential in maintaining price stability

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