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THRESHOLD EFFECT OF INFLATION ON MONEY DEMAND IN MALAYSIA

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ABSTRACT

This study is an attempt to empirically investigate the role of inflation on the money demand function in Malaysia. The main purpose of this study is to focus specifically on the relationship between inflation and money demand, that is whether the relationship between inflation and money demand is non-linear and as well as to estimate the threshold level; at which the sign of the relationship between two variables would switch. In order to achieve the objective, quarterly time-series data over the quarterly period 1991:1 through 2009:1 was used in this study. This study applied both the threshold regression and polynomial regression estimation techniques to estimate the model. The findings can be summarized as follow. Inflation plays an important role in demand for M1. M1 is a function of inflation rate besides the rates of return of alternative assets and real income. The high and moderate inflation have different influence on demand for M1, following the empirical results of threshold model and polynomial regression model. The estimated model suggested that a 3.5 percent inflation rate is an optimal threshold level. The positive relationship between inflation and demand for M1 is translating into negative relationship when inflation increases above threshold level, 3.5 percent inflation rate. Results of polynomial regression show that the relationship between inflation and demand on M1 is nonlinear and represents a parabola. When the inflation rate increases above 3.64 percent, relationship between inflation and demand for M1 will become negative. On the other hand, results of the model demand for M2 recommend that 2.5 percent inflation rate is an optimal threshold level of inflation. The findings also indicate that inflation will increase the demand for M2 at the moderate rate of inflation. However, inflation will reduce the demand for M2 beyond the optimal threshold level of inflation. Results of polynomial regression model also shows that inflation is negative in relation to money demand; when the rate of inflation is above a critical level of inflation. Relationship between inflation and money demand follows the quadratic function. Demand for M2 is only a function of rate of inflation and real income because treasury bills rate is statistically insignificant.

Keywords: Money demand function, inflation, threshold regression, polynomial regression, optimum threshold level

INTRODUCTION

Demand for money is an important element in macroeconomic analysis, especially in constructing an optimal and identical monetary policy. Erroneously in money demand estimated will make the monetary authorities take a wrong action when policy is designed. Implementation of such policy as a following will bring a disaster to the country. Therefore, there were numerous theoretical literature and empirical studies on the demand for money was conducted to provide more understanding about conditions and feathers of demand for money. Most of the theoretical grounds and accumulated evidence indicate that a strong link between money and price, no matter studies of period of accelerating and sustained inflation as well as studies of demand for money. The significance of the expected rate of inflation as a factor influencing the demand for money is well established.

Although, it has been generally accepted that amount of money demanded responds to expected rate of inflation, the expected sign of the relationship between expected rate of inflation and demand for money still remained some controversies. Several theoretical and empirical literatures shown a negative relationship between inflation and demand for money. Nevertheless, some economists and researchers have accounted for the opposite. There is also a possibility that the demand for money influenced by inflation positively. Recently, linear co-integration analysis has been the mainstream approach in examining the money demand function. Studies of Cagan as well as most later empirical work is essentially single equation regression and postulate a linear relationship between expected rate of inflation and demand for

money. However, there is some empirical evidence suggest that Cagan money demand function does not fit well for low and high inflation period at the same time and present of a varying coefficient (Cagan, 1956., Barro, 1970., Khan, 1975 and Bental & Eckstein, 1997). Theoretically, there is no reason to believe that economic systems must be intrinsically linear. Empirically, there were a great number of studies showing that inflation rate causes a non-linear in the relation with demand for money. Michael et al (1994) points to the necessity to distinguish between high inflation and hyperinflation episodes in the study of money demand. Empirical result of Lutkepohl et al (1999) shown that transition function is close to step function which implies a different adjustment for positive and negative inflation rate. Hence, the model indicates that agent react differently to positive and negative inflation rate. Test of no additional non-linearity suggest that the non-linearity was found after the estimation. Empirical results of B. Emiliano et al (2009) using time-series approach are consistent with cross-country evidence of study by De Grauwe and Polan (2005). Findings of both studies show that money velocity is positively correlated with money growth and inflation under high inflation. On the contrary, velocity is negatively correlated to inflation and money growth under low inflation. A low real money demand is same as high money velocity. If such a nonlinear relationship exists then it should be possible, in principle, to estimate the threshold level, at which the sign of relationship between the inflation and money demand would switch. However, the test of possibility exist of threshold level, typically is more focus on the relationship between inflation and economic growth.

This study is an attempt to empirically investigate the role of inflation on the money demand function in Malaysia. The main purpose of this study is to focus specifically on the relationship between inflation and money demand, that is whether the relationship between inflation and money demand is non-linear, or in other words, high and moderate inflation have different influence on money demand and as well as to estimate the threshold, above which level of inflation will affects money demand adversely than a moderate of inflation. This study applied both the threshold regression and polynomial regression techniques to estimate the model. This paper is organized as follows: The next section discusses the data and model used in this study. The next section that follows reports and discusses the empirical results while the last section summaries the conclusion and policy implications.

DATA AND SPECIFICATION MODEL

Data Issues

Quarterly time series data over the period 1990:1 through 2009:1 was used in the study. The data series of monetary aggregates (M1&M2), consumer price index (CPI), gross domestic product and discount rate on treasury bills are obtained from the online database of the 'Data Stream International Ltd'. Consumer price index measures of price level. It is used to convert or deflate nominal magnitude of cash balances and income to real magnitude. This is accomplished by dividing the monetary aggregates and gross domestic product by consumer price index respectively. Inflation rate is calculated from annual price changes, as $100(CPI_t - CPI_{t-4})/CPI_{t-4}$. Real money and real income were further transformed into logarithm form.

Model Framework

Dominated of previous studies provide the empirical evidences and show that demand for money depends on level of transactions or economic activities which is represented by variable expressing real wealth, real income or expenditure, and opportunity cost of holding money which is proxied by various kinds of market interest rates and rate of inflation. Generally, money demand function is used in this study can be specified as:

$$Rm = f(Y, r, INF)$$

Rm is the log of real money aggregates (lnRM1&lnRM2) and used as the dependent variable in the functional relationship which represent the narrow money and broad money respectively. Log of real gross domestic product (lnGDP/P) will be used as scale variable (Y). It is expected to be positively related to the real demand for money (Rm1&Rm2). Opportunity cost of holding money (r) is proxied by discount rate on treasury bills (TB). Coefficient of the discount rate of treasury bills is expected to be negative since it is the yield on asset alternative to money. Besides, inflation rate (INF) also can be considered as a proxy of

opportunity cost instead of discount rate of treasury bills because it can be viewed as the return on real asset. Real asset as a substitute of money, higher inflation rate means higher return on real asset, it will less the incentive to hold money when inflation rate is high. However, in the case of moderate rate of inflation, higher inflation rate will induce the people to increase their money holding for expenditure and investment. Therefore, inflation will affect money demand differently on the high and low level of inflation.

Threshold Model

Model estimated in the paper formulated and modified from the model developed by Khan and Senhadji (2001) for the analysis of the threshold level of inflation for industrialized and developing countries. The variables of model are real cash balances (lnRm1&lnRm2), inflation (INF), real income (lnGDP/P) and discount rate on treasury bills (TB). Threshold regression consisting of two linear segments is used in this study. Money demand function will change its slope beyond the threshold level. Based on the data and value of the threshold level INF*, technique of dummy variable is used to estimates the (differing) slopes of the two segments of the threshold regression. The equation to estimate threshold level of inflation has been considered in the following form:

$$\ln Rm1 = \alpha 0 + \beta 1 \ln GDP/P + \beta 2TB + \beta 3INF + \beta 4(INF - INF^*)D + u$$

$$\ln Rm2 = \alpha 0 + \beta 1 \ln GDP/P + \beta 2TB + \beta 3INF + \beta 4(INF - INF^*)D + u$$

The dummy variable is defined in the following way:

$D = 1$ if $INF > INF^*$
$= 0$ if $INF \leq INF^*$

Assume $E(u) = 0$
$E(\ln Rm1 \mid D=0) = \alpha 0 + \beta 1 \ln GDP/P + \beta 2TB + \beta 3INF$
Which given the mean money demand up to the threshold level INF* and
$E(\ln Rm2 \mid D=1) = \alpha 0 - \beta 4INF^* + \beta 1 \ln GDP/P + \beta 2TB + (\beta 3+\beta 4)INF$
Which gives the mean money demand beyond the threshold level INF*.

$\beta 3$ measures the effect of inflation on money demand (slope of the regression line) when inflation is moderate, less than or equal to threshold level INF*. Sum of two coefficients ($\beta 3+\beta 4$) measure the inflation effect on money demand (slope of the regression line) when inflation is high or greater than threshold level INF*. A hypothesis test whether there is a break in the regression at the threshold value INF* can be conducted by noting the statistical significance of the estimated differential slope coefficient $\beta 4$. The value of INF* is given arbitrarily for the estimation purpose, the optimal INF* is obtained by finding the value that minimizes the residual sum of squares (RSS). Thus, the optimal threshold level of inflation is the one that minimizes the sequence RSS.

Quadratic Model

Quadratic model or more generally known as Polynomial regression model is used to show that the nonlinear relationship between inflation and money demand. Mathematically, the model is represented by the following equations:

$$\ln Rm1 = \alpha 0 + \beta 1 \ln GDP/P + \beta 2TB + \beta 3INF + \beta 4INF2 + u$$

$$\ln Rm2 = \alpha 0 + \beta 1 \ln GDP/P + \beta 2TB + \beta 3INF + \beta 4INF2 + u$$

The above equations would capture the quadratic relationship between inflation and money demand. However, relationship between the other variables and money demand is still remained the linear one. INF2 are nonlinear function of INF and hence, strictly speaking, do not violate the non-multicollinearity assumption. Derivative of equations is taken. Next, set this derivative to zero to get the maximum point or break point of the money demand function.

ANALYSIS OF RESULTS

Threshold Model Analysis For M1

Based on Table 1, the p-value on coefficient of inflation rate indicates that moderate inflation level or less than 2 percent (INF*≤2) there is an insignificant relationship between money demand and inflation. For higher inflation rate or more than 2 percent (INF*>2), relationship between both variables become significant at 5 percent level. Relationship between inflation and money demand is nonlinear in Malaysia. 3.5 percent of inflation rate is a threshold level where the value of INF* minimizes the residual sum of squares (RSS).

As these results show, holding the other variables constant, a 1 percent increase in the inflation rate led on the average to 2.3 percent increase in money demand until the threshold level, 3.5 percent of inflation rate. The positive relationship between inflation and demand for M1 is translating into negative relationship when inflation increases above threshold level. Over 3.5 percent of inflation rate, if inflation rate goes up by 1 percent, on average, the money demand goes down by 3.7 percent. The different between two slopes is significant because the dummy variable is significant at 1 percent level.

Under higher inflation or over 3.5 percent, the result is consistent with the study was conducted Friedman (1956) and Cagan (1956). Inflation can be viewed as a tax on money and as a nominal rate of return. A 10 percent annual increase in the price level implies that money balances depreciate in real value of 10 percent annual rate. The higher expected 'tax rate', the greater the cost of holding money is and hence less money will be demanded. Another way to present the same principle is to point out that a 10 percent inflation rate implies that the nominal rate of return on durable goods is 10 percent. As the expected inflation rate escalates, the incentive to substitute durable goods for money balances is increased. Thus, as inflation rate rises, the demand for real money declines and velocity of money escalates. On the contrary, the result is consistent with the view of Mansor Jusoh (1985), if there is an increase in inflation, the level of cash balances must be raised to keep up with the anticipated increase in future transactions under moderate inflation. Real income is statistical significant at 1 percent level. Income elasticity is positive and more than 1.

After considering the discount rate of treasury bills (refer to Table 2), the threshold level is still at 3.5 percent of inflation rate where the value of INF* minimizes the residual sum of squares (RSS). Moreover, the value of residual sum of squares is smaller than money demand model without considering the rate of return of alternative asset. The insignificant relationship is translating into significant one as the rate of inflation increases above 1.5 percent (INF*>1.5) at 10 percent level. Demand for M1 is also a function of real income and discount rate of treasury bills besides of inflation rate. As these results show, holding the other variables constant, a 1 percent increase in the inflation rate led on the average to 3.4 percent increase in money demand until the threshold level, 3.5 percent of inflation rate. The positive relationship between inflation and demand for M1 is translating into negative relationship when inflation increases above threshold level. Over 3.5 percent of inflation rate, if inflation rate goes up by 1 percent, on average, the money demand goes down by 3.1 percent. The different between two slopes is significant because the dummy variable is significant at 1 percent level.

Polynomial Regression Model Analysis For M1

lnRm1 = -0.935*** + 1.116 lnGDP/P*** - 0.018TB3** + 0.051INF** - 0.007INF2**
se = (0.271) (0.036) (0.008) (0.022) (0.003)
R2 = 0.973 Adjusted R2 = 0.971
se = Standard error
*** = Significant at 1 percent level ** = Significant at 5 percent level

The equation shows that the relationship between money demand and inflation is non-linear because INF2 is significant at 5 percent level. When the inflation rate is moderate or less than 3.64 percent, inflation is positively correlated to money demand. As inflation rate increases, money demand will be increasing but at a decrease rate. When the inflation rate is high or increase more than 3.64 percent, an increase in inflation rate will reduce the desire to hold money. Inflation will become negatively correlated to money demand.

This result is consistent with the result of Threshold model. Besides, the finding also suggests money demand is a function of inflation and inflation is an important factor and should include in the money demand function. This is because the estimates of the inflation coefficient is statistical significant at 5 percent level. Inflation is not only play an implicit role in money demand function.
However, the conflict still remains because some of the economists believe that rate of inflation and rate of interest are closely correlated. As mention by Fisher hypothesis, when the inflation rate is moderate, variation in the inflation rate can be captured by variation in nominal interest rate. Therefore, incorporating both inflation rate and interest rate in the money demand equations often lead to multicollinearity and biased estimates of their coefficients. But, as noted, the result of individual t test shows that all of the partial slope coefficients are statistically different from zero although the R2 is high. Hence, it will not be a problem to include both inflation rate and interest rate in a same equation because the classic symptom of multicollienearity is not existence. Income elasticity and interest elasticity are equal to 1.116 and -0.0794 respectively. Both have a correct sign and significant at 1 percent level and 5 percent level. Since R2 can at most be 1 means that variation in the money demand is explained well by model.

Threshold Model Analysis For M2

The Table 3 shows that there is a significant relationship between money demand and inflation according to the p-value on coefficient of inflation rate although the inflation rate is low (INF*≤.1.5). Relationship between inflation and money demand is nonlinear in Malaysia. 2.5 percent of inflation rate is a threshold level where the value of INF* that minimizes the residual sum of squares (RSS).

As these results show, holding the other variables constant, a 1 percent increase in the inflation rate led on the average to 4.6 percent increase in money demand until the threshold level, 2.5 percent of inflation rate. The positive relationship between inflation and demand for M1 is translating into negative relationship when inflation increases above threshold level. Over 2.5 percent of inflation rate, if inflation rate goes up by 1 percent, on average, the money demand goes down by 1.1 percent. The different between two slopes is significant because the dummy variable is significant at 10 percent level. Income elasticity of demand for M2 is around unity. In the case of moderation and low inflation rate, an increase in the rate of inflation increases household expenditure on a given basket of commodities. The demand for money is therefore, expected increase.

After consideration of discount rate of treasury bills (refer to Table 4), the results of M2 are different with M1. Table shows that discount rate of treasury bills has a negative sign but it is not significant. Thus, inflation rate has been either consider or found to be a more appropriate proxy in the money demand function, in comparison with discount rate of treasury bills. It might due to the less organized dealings in bills or commercial paper and where the market in government short-term and long-term securities and corporate stock are often lacking in developing countries. Asset choices of wealth owners in these countries are often restricted to holding either money or real goods such as land, houses, agricultural commodities, consumer durable, etc. Income has appeared empirically to be a significant variable in demand for money function.

After considering the discount rate of treasury bills, the threshold level is still at 2.5 percent of inflation rate where the value of INF* minimizes the residual sum of squares (RSS). The positive relationship between inflation and demand for M1 is translating into negative relationship when inflation increases above threshold level. 1 percent increase in the inflation rate led on the average to 5.7 percent increase in money demand until the threshold level, 2.5 percent of inflation rate. Over 2.5 percent of inflation rate, if inflation rate goes up by 1 percent, on average, the money demand goes down by 0.6 percent. The different between two slopes is significant because the dummy variable is significant at 5 percent level. The result also suggest that demand for money as a function of inflation although the inflation rate is low (INF*≤1.5). Coefficient of inflation rate is significant at 10 percent level for INF*≤1.5.

Polynomial Regression Model Analysis For M2

lnRm2 = -1.734*** + 1.442lnGDP*** - 0.014TB3 + 0.068INF** - 0.008INF2**
se = (0.327) (0.044) (0.009) (0.027) (0.003)
R2 = 0.975 Adjusted R2 = 0.973
se = Standard error
*** = Significant at 1 percent level ** = Significant at 5 percent level

The equation shows that the relationship between money demand and inflation is non-linear because INF2 is significant at 5 percent level. When the inflation rate is moderate or less than 4.25 percent, inflation is positively correlated to money demand. Inflation rate increase, money demand will be increasing but at a decrease rate. When the inflation rate is high or increase more than 4.25 percent, an increase in inflation rate will reduce the desire to hold money. Inflation will become negatively correlated to money demand. This result is consistent with the result of Threshold model. Besides, the finding also indicate that money demand is a function of inflation and inflation is an important factor should include in the money demand function if compared with discount rate of treasury bills because the estimates of the inflation coefficient is statistical significant at 5 percent level. However, the estimate of discount rate of treasury bills is statistical not significant. This insensitivity of M2 with respect to discount rate of treasury bills might be due to the certain component of M2 is interest-bearing instrument. Regarding to the report from central bank, fixed deposit is the major component in Narrow Quasi-money. Interest rate of fixed deposit is higher than discount rate of treasury bills. Therefore, it is less attractive for people to substitute money for it. Income elasticity is equal to 1.442 and the coefficient is significant at 1 percent level.

CONCLUSION

Inflation plays an important role in demand for M1. M1 is a function of inflation rate besides the rates of return of alternative assets and real income. The high and moderate inflation have different influence on demand for M1, following the empirical results of threshold model and polynomial regression model. The estimated model suggested that a 3.5 percent inflation rate is an optimal threshold level. The positive relationship between inflation and demand for M1 is translating into negative relationship when inflation increases above threshold level, 3.5 percent inflation rate. Results of polynomial regression show that the relationship between inflation and demand on M1 is nonlinear and represents a parabola. When the inflation rate increases above 3.64 percent, relationship between inflation and demand for M1 will become negative. On the other hand, results of the model demand for M2 recommend that 2.5 percent inflation rate is an optimal threshold level of inflation. The findings also indicate that inflation will increase the demand for M2 at the moderate rate of inflation. However, inflation will reduce the demand for M2 beyond the optimal threshold level of inflation. Results of polynomial regression model also shows that inflation is negative in relation to money demand; when the rate of inflation is above a critical level of inflation. Relationship between inflation and money demand follows the quadratic function. Demand for M2 is only a function of rate of inflation and real income because treasury bills rate is statistically insignificant. During the high inflation period, inflation is negative correlated with money demand. High money growth is consistent with high inflation, a low real money demand (high money velocity). The results for the high inflation are consistent with Cagan (1956) for high inflation economies. On the contrary, inflation is positive correlated with money demand for the moderate inflation period and consistent with the cross country findings of De Grauwe and Polan. Quantity theory of money, which states that institutional and technological features of the economy would affect velocity only slowly over time, so velocity would normally be reasonably constant in the short run. However, the empirical evidence suggests that money velocity is in general volatile, contradicting the assumption of a stable money demand.

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TABLE 1: Demand for M1 (Without discount rate of Treasury bills variable)

INF*	Variables	Coefficient	Standard	t-statistics	p-value	RSS
1.5	Konstan	-1.183	0.209	-5.672	0.000	
	lnGDP/P	1.153	0.026	44.387	0.000	
	INF	0.009	0.066	0.136	0.892	0.384
	(INF>1.5)*(INF-1.5)	-0.016	0.069	-0.236	0.814	
2.0	Konstan	-1.274	0.192	-6.638	0.000	
	lnGDP/P	1.156	0.026	45.281	0.000	
	INF	0.047	0.032	1.445	0.153	0.370
	(INF>2.0)*(INF-2.0)	-0.062	0.037	-1.678	0.098	
2.5	Konstan	-1.317	0.184	-7.141	0.000	
	lnGDP/P	1.162	0.025	46.483	0.000	
	INF	0.042	0.020	2.173	0.033	0.350
	(INF>2.5)*(INF-2.5)	-0.066	0.025	-2.634	0.010	
3.0	Konstan	-1.362	0.184	-7.397	0.000	
	lnGDP/P	1.170	0.025	46.733	0.000	
	INF	0.032	0.014	2.310	0.024	0.339
	(INF>3.0)*(INF-3.0)	-0.063	0.021	-3.053	0.003	
3.5	Konstan	-1.398	0.188	-7.447	0.000	
	lnGDP/P	1.177	0.026	45.994	0.000	
	INF	0.023	0.011	2.052	0.044	0.337
	(INF>3.5)*(INF-3.5)	-0.060	0.019	-3.113	0.003	
4.0	Konstan	-1.417	0.196	-7.223	0.000	
	lnGDP/P	1.182	0.027	44.115	0.000	
	INF	0.015	0.010	1.560	0.123	0.345
	(INF>4.0)*(INF-4.0)	-0.059	0.021	-2.806	0.007	
4.5	Konstan	-1.361	0.208	-6.543	0.000	
	lnGDP/P	1.177	0.029	41.271	0.000	
	INF	0.006	0.009	0.669	0.506	0.366
	(INF>4.5)*(INF-4.5)	-0.046	0.024	-1.886	0.064	

TABLE 2: Demand for M1 (With discount rate of Treasury bills variable)

INF*	Variables	Coefficient	Standard	t-statistics	p-value	RSS
1.5	Konstan	-0.798	0.290	-2.756	0.007	
	lnGDP/P	1.102	0.037	29.764	0.000	
	TB3	-0.015	0.008	-1.882	0.064	0.365
	INF	0.018	0.065	0.270	0.788	
	(INF>1.5)*(INF-1.5)	-0.017	0.068	-0.253	0.801	
2	Konstan	-0.867	0.270	-3.204	0.002	
	lnGDP/P	1.102	0.036	30.538	0.000	
	TB3	-0.016	0.008	-2.087	0.041	0.347
	INF	0.061	0.032	1.885	0.064	
	(INF>2.0)*(INF-2.0)	-0.069	0.036	-1.895	0.062	
2.5	Konstan	-0.871	0.258	-3.372	0.001	
	lnGDP/P	1.102	0.035	31.707	0.000	
	TB3	-0.018	0.008	-2.388	0.020	0.323
	INF	0.058	0.020	2.890	0.005	
	(INF>2.5)*(INF-2.5)	-0.074	0.024	-3.018	0.004	
3	Konstan	-0.914	0.255	-3.584	0.001	
	lnGDP/P	1.111	0.034	32.4113	0.000	
	TB3	-0.018	0.007	-2.446	0.017	0.311
	INF	0.046	0.015	3.124	0.003	
	(INF>3.0)*(INF-3.0)	-0.070	0.020	-3.440	0.001	
3.5	Konstan	-0.962	0.258	-3.734	0.000	
	lnGDP/P	1.120	0.035	32.403	0.000	
	TB3	-0.018	0.007	-2.384	0.020	0.311
	INF	0.034	0.012	2.908	0.005	
	(INF>3.5)*(INF-3.5)	-0.065	0.019	-3.447	0.001	
4	Konstan	-1.003	0.267	-3.757	0.000	
	lnGDP/P	1.128	0.036	31.501	0.000	
	TB3	-0.016	0.007	-2.212	0.030	0.322
	INF	0.025	0.010	2.387	0.020	
	(INF>4.0)*(INF-4.0)	-0.062	0.020	-3.033	0.003	
4.5	Konstan	-0.953	0.277	-3.443	0.001	
	lnGDP/P	1.123	0.037	30.198	0.000	
	TB3	-0.017	0.008	-2.166	0.034	0.342
	INF	0.016	0.010	1.629	0.108	
	(INF>4.5)*(INF-4.5)	-0.052	0.024	-2.160	0.034	

TABLE 3: Demand for M2 (Without Treasury bills rate variable)

INF*	Variables	Coefficient	Standard deviation	t-statistics	p-value	RSS
1.5	Konstan	-2.026	0.242	-8.385	0.000	
	lnGDP/P	1.464	0.030	48.688	0.000	
	INF	0.139	0.077	1.811	0.075	0.516
	(INF>1.5)*(INF-1.5)	-0.141	0.080	-1.767	0.082	
2.0	Konstan	-1.961	0.227	-8.650	0.000	
	lnGDP/P	1.466	0.030	48.589	0.000	
	INF	0.069	0.038	1.818	0.073	0.516
	(INF>2.0)*(INF-2.0)	-0.076	0.044	-1.747	0.085	
2.5	Konstan	-1.957	0.223	-8.761	0.000	
	lnGDP/P	1.470	0.030	48.543	0.000	
	INF	0.046	0.024	1.955	0.055	0.513
	(INF>2.5)*(INF-2.5)	-0.057	0.030	-1.879	0.064	
3.0	Konstan	-1.956	0.228	-8.585	0.000	
	lnGDP/P	1.473	0.031	47.563	0.000	
	INF	0.030	0.017	1.720	0.090	0.519
	(INF>3.0)*(INF-3.0)	-0.042	0.026	-1.645	0.105	
3.5	Konstan	-1.955	0.234	-8.356	0.000	
	lnGDP/P	1.475	0.032	46.241	0.000	
	INF	0.020	0.014	1.476	0.145	0.524
	(INF>3.5)*(INF-3.5)	-0.034	0.024	-1.404	0.165	
4.0	Konstan	-2.017	0.240	-8.411	0.000	
	lnGDP/P	1.484	0.033	45.302	0.000	
	INF	0.021	0.012	1.720	0.090	0.516
	(INF>4.0)*(INF-4.0)	-0.045	0.026	-1.751	0.084	
4.5	Konstan	-2.013	0.248	-8.105	0.000	
	lnGDP/P	1.485	0.034	43.601	0.000	
	INF	0.016	0.011	1.478	0.144	0.522
	(INF>4.5)*(INF-4.5)	-0.044	0.029	-1.511	0.135	

TABLE 4: Demand for M2 (With discount rate of Treasury bills variable)

INF*	Variables	Coefficient	Standard deviation	t-statistics	p-value	RSS
1.5	Konstan	-1.748	0.341	-5.131	0.000	
	lnGDP/P	1.428	0.044	32.777	0.000	
	TB3	-0.011	0.009	-1.156	0.252	0.506
	INF	0.145	0.077	1.891	0.063	
	(INF>1.5)*(INF-1.5)	-0.142	0.080	-1.779	0.080	
2	Konstan	-1.654	0.326	-5.081	0.000	
	InGDP/P	1.425	0.043	32.809	0.000	
	TB3	-0.012	0.009	-1.306	0.196	0.504
	INF	0.080	0.039	2.060	0.043	
	(INF>2.0)*(INF-2.0)	-0.081	0.044	-1.863	0.067	
2.5	Konstan	-1.627	0.321	-5.070	0.000	
	lnGDP/P	1.426	0.043	32.999	0.000	
	TB3	-0.013	0.009	-1.420	0.160	0.498
	INF	0.057	0.025	2.319	0.023	
	(INF>2.5)*(INF-2.5)	-0.063	0.030	-2.066	0.043	
3	Konstan	-1.639	0.325	-5.045	0.000	
	lnGDP/P	1.431	0.044	32.804	0.000	
	TB3	-0.013	0.009	-1.360	0.178	0.505
	INF	0.039	0.019	2.110	0.039	
	(INF>3.0)*(INF-3.0)	-0.047	0.026	-1.811	0.075	
3.5	Konstan	-1.652	0.330	-5.003	0.000	
	lnGDP/P	1.436	0.044	32.402	0.000	
	TB3	-0.012	0.009	-1.291	0.201	0.512
	INF	0.028	0.015	1.881	0.064	
	(INF>3.5)*(INF-3.5)	-0.037	0.024	-1.538	0.129	
4	Konstan	-1.719	0.334	-5.146	0.000	
	lnGDP/P	1.445	0.045	32.264	0.000	
	TB3	-0.012	0.009	-1.273	0.207	0.504
	INF	0.028	0.013	2.104	0.039	
	(INF>4.0)*(INF-4.0)	-0.047	0.026	-1.845	0.069	
4.5	Konstan	-1.712	0.337	-5.073	0.000	
	lnGDP/P	1.445	0.045	31.861	0.000	
	TB3	-0.012	0.009	-1.314	0.193	0.509
	INF	0.024	0.012	1.930	0.058	
	(INF>4.5)*(INF-4.5)	-0.048	0.029	-1.652	0.103	