The Demand for Money during Transition from High to Low Inflation in Turkey in the Period 2002 - 2014

Burhan Doğan

Abstract

In this study, the aim is to estimate the demand for money during transition from high to low inflation in Turkey using autoregressive distributed lag (ARDL) approach to cointegration analysis. Empirical results show the existence of cointegration and stable long-term relation among M1 monetary aggregate, income, inflation and exchange rate. As the inflation elasticity of demand for money during the investigation period is negative, the elasticities of income and exchange rate are positive. This study represents that the depreciation of domestic currency increases the demand for money, and supports the view of wealth effect. The society substitutes the money balances with real assets pursuant to our expectations. When we evaluate it with CUSUM and CUSUMSQ tests, the obtained results show that M1 demand for money function is stable during the period of January 2002 – December 2014.

Keywords: Demand for Money, ARDL, Stability of Demand for Money.
JEL Classification: E4; E44

I. Introduction

Since the estimation of demand for money is very important to determine the effects of monetary policy during the process of steering the economy, it has a key role. Besides the estimated values of parameters, the stability of demand for money is one of the most important points in macroeconomic policy analysis. In this context, the important point is to meet the requirements which the demand for money must have in order that the central bank uses fruitfully the instruments that it holds. This may only possible by estimating the econometrically meaningful demand for money function.

It is a fact that there is a wide literature established throughout the years related to the estimation of demand for money. Naturally, the evaluation of aforesaid theoretical and empirical literature exceeds the dimension of this work[1]. Since the aim is not to evaluate this wide theoretical and empirical literature on demand for money in our study, those that attract the attention among the empirical works, which were conducted recently, will be discussed in the following section.

The cointegration technique, developed by Johansen (1988) and Johansen and Juselius (1990), had been used in many studies exploring the long-term relation between demand for money and factors determining it. It is observed that not only the industrialized countries but also the developing countries are subject to analyze in these studies in which this technique is used. It is found that almost a standard specification is implemented in those studies and the demanded real money amount is discussed as a function of scale variables. These scale variables are discussed as the income (or expenditures), return rate of money, opportunity cost of holding money (domestic interest rate and/or expected inflation rate). Including the expected inflation in the model is advised especially for the developing economies, because the physical assets have the primary tool characteristic for hedging against the inflation due to existences of less developed financial system and interest rate determined out of market, especially regarding the non-banking sector in those countries (Rao and Kumar, 2007).

[1]Sriram (2001) may be examined for a systematic evaluation on this issue.

Existence of underdeveloped money and capital markets in the developing countries lead to limited alternatives of cash in hand. On the other hand, the existence of less developed money and capital markets may also have the negative impacts on the stability of demand for money (Lungu et al., 2012). For example, in the research by Rutayisire (2008) in which Johansen cointegration technique is used, it is pointed out the existence of a powerful currency substitution and the value of positive income elasticity in Rwanda. In the model used in that study, it is found that the interest rate, determined by the government authority out of market mechanism, is statistically insignificant.

In the research by Bashier and Dohlan (2011) in which the demand for money and its stability was examined for Jordan during 1975 – 1990, the results were obtained contradictory with the previous works for this country. The attention was attracted to that the stability tests were not executed in the previous works and they would cause the false regression issues. It is found that the demand for money function is stable in the period under investigation considering the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) tests. According to the empirical results obtained from the aforesaid work, as the real money balances represent a positive relationship with the real income, the interest rate and exchange rate have the negative relationship. This conforms to the hypotheses of demand for money theory.

In the work by Narayan and Narayan (2008) for Fiji, it has been emphasized that as the demand for money function was estimated, it must have been considered not only the stability tests but also the structural breaks in the data. In this study, the existence of structural break was tested through the bound test which is applicable disregarding whether the relevant variables are stationary or not. According to the authors, since the structural breaks were taken into account in the previous works related to estimating the demand for money function for Fiji, the null hypothesis, stating that unit root was present in the examined time series, was rejected. In fact, the existence of structural break in the examined time series reduces the possibility of rejecting the unit root. However, it was found in the work by Lungu et al. (2012) that even though there was more than one structural change in Malawi, the stability of demand for money was not affected by it.

The demand for money function was also examined for the small open economies such as Caribbean. For example, Jackman (2010) estimated the demand for money function for Barbados using the quarterly data from the period of 1982-2010 and ARDL model. According to the obtained result, the economic instability in Barbados causes the instability of relationships between the explanatory variables in the demand for money function and dependent variable. According to the author, the economic units pass the portfolio decisions in an environment where the macroeconomic instabilities persist and thus, the currency in hand is affected by it. In addition to the economic instability, the coefficients of interest rate of the treasury bonds and real income have also a significant impact on the demand for money. We should emphasize that there is a less number of work including the economic instabilities in the model regarding the demand for money and the results from such studies are mixed. In other words, the impact of economic instabilities on the demand for money varies from country to country.

The demand for money function is estimated through the ARDL and VAR/VECM techniques, respectively using the annual data for Jamaica in the works by Atkins (2005) and Canova (2006). The existence of cointegration relationship is determined in both works and the interest rate losses the attribute of being a statistically significant variable during this

process. It is considered that this is caused by the existence of shallow financial markets and the instability observed in the interest rate. The financial crises, experienced in Jamaica, are also taken into account during the investigation period in the aforesaid works, but it is concluded that their impact on demand for money is negligible and the demand for money is stable.

VAR/VECM technique was used in the work by Watson (2003) for Trinidad-Tobago and it was emphasized that as the instable demand for money function was determined, it was moved away from the equilibrium gradually. The foreign price level and oil prices were also included in the model used in that work, and it was determined that the coefficients, estimated related to those variables, were valid statistically. This is explained with the oil dependency of the economy and showing the high openness of the country to abroad. However, the distribution of error terms in both works is not normal. This causes that the model specifications are failed and the possibilities may not be calculated. According to the obtained results, the power of monetary authority in the aforesaid country is insufficient to achieve the ultimate macroeconomic objectives. The attention is attracted to the power of ğass-through effect of the oil prices via international reserves and it is stated that use of exchange rate is proper for implementing the monetary policy in the study.

In the work by Sanches-Fung (2004) for Dominic Republic, the demand for money is estimated with error correction model using the monthly data during the period of 1991 – 2003. The obtained results show that the process toward equilibrium during the post-1990 period disappears. In the previous works, it is one of the primary results of study that when the process toward the equilibrium is taken into account, even if it works slowly, that structural change must be considered. The impacts of all explanatory variables used in the model are statistically valid on the demand for money. As it is determined the existence of cointegration relationship in this study, it is found that the obtained results are compatible with the theory (i.e., the explanatory variables have the expected signs).

In the study aiming to estimate the demand for money for Guyanese economy, Egoume and Bossogo (2000) mention that there is a cointegration relationship between the variables. In this study, the monthly data is used and the value of income elasticity is determined close to the unity, and the attention is attracted to the negative relationship between the interest rate and alternative assets. In fact, the demand for money is not affected by the net deposit interest rate and real income movements in long-term.

Halıcıoğlu and Uğur (2005) studied the stability of demand function for narrowly defined money (M1) in Turkey during 1950 – 2002. The researchers estimated the M1 demand using the cointegration technique recommended by Pesaran et al. (2001) and tested the stability of this function via CUSUM and CUSUMSQ techniques. According to the obtained results, there was a stable demand for money function in Turkey during the studied period and M1 monetary aggregate might be used as the intermediate target in the implementation of monetary policies.

In the work by Siklar and Gerek (2002), the demand for money model is estimated for M1 and M2 using the monthly data in Turkey during 1987 – 2000. In the study which investigates the effects of inflationary expectations and currency substitution on the demand for money in an high inflationary environment, the error correction model was used based on the Johansen – Juselius cointegration approach and the stability of demand for money was

discussed. The authors determine the instable demand for money as presenting a powerful expectation impact and existence of a powerful currency substitution process.

In the Siklar's (2001) study which the technical details of Johansen's cointegration analysis were discussed, this technique was applied to the demand for money in Turkey. After discussing the explanatory powers of variables affecting the demand for money via cointegrating vectors, it was stated that the income, exchange rate and inflationary expectations were the variables which must have been taken into account during the process of demand for money, and that since the interest rate did not reflect the opportunity cost during the high inflation period, it was statistically insignificant in the model.

This study has two objectives. The first is to examine the cointegration relationship between M1 (and M2) and income, inflation and exchange rate in Turkey using the ARDL approach. The second is to test the stability of M1 and M2 demand functions. As stated in the literature, since the ARDL approach doesn't consider whether or not the relationship between the variables is stable, this point gains importance.

The remainder of the paper is organized as follows: the demand for money model to be estimated and ARDL approach are discussed in the second section. Empirical results are presented and evaluated in the third section, the fourth section summaries the results of study.

II. Demand For Money Model and ARDL Approach

It is possible theoretically to talk about various factors determining the demand for money. The common tendency in the literature is that the demand for money equation covers a scale variable related to the transaction volume in the economy and a variable representing the opportunity cost of holding money. For the summary of theoretical discussions on this topic, Khan (1994), Pradhan and Subramanian (1998) and Bahmani-Oskooee (2001) may be studied. In an open economy with free capital movements, in order to observe the effect of changes in the value of domestic currency on money demand, it is recommended that a variable reflecting the relative return of foreign currency with respect to domestic one such as exchange rate, foreign interest rate or interest rate differential should be included in the money demand equation (Chowdury, 1997; Khalid, 1999). Since the developing countries do not have a deepened financial system and well organized markets inflation rate is also added to the demand for money model representing the opportunity cost of holding money. In the study of Bahmani-Oskooee and Rehman (2005), with reference to the above summarized reasons, it is accepted that the demand for money function has the following form:

$$\log(M_t) = \beta_0 + \beta_1 log(Y_t) + \beta_2 \pi_t + \beta_3 log(E_t) + \varepsilon_t \qquad (1)$$

where, M denotes the monetary aggregate (M1 or M2), Y denotes a criterion related to the real income as a scale variable, π denotes the inflation rate, E denotes the exchange rate and ε denotes the error term. According to Arango and Nadiri (1981), it is expected that β_1 coefficient has a positive value while β_2 coefficient has a negative value. β_3 coefficient may have either negative or positive value. If E is defined as the value of one unit of foreign currency in terms of domestic currency, depreciation of domestic currency or an increase in E raises the value of foreign assets in terms of domestic currency. If such enhancement leads to an increase in the wealth value, then the demand for domestic currency increases and causes that β_3 coefficient has a positive value. In fact, if the increase in E stimulates expectations that the erosion in the domestic currency would continue, then the society would tend to hold less

domestic currency and more foreign asset. In this case, it is expected that β_3 coefficient would have a negative value.

In order to implement the cointegration technique, it should be known the integration level of each variable in the model. As the attention is attracted in the literature, the weaknesses in the unit root tests cause that the different tests produce the different results. Considering this issue, Pesaran et al. (2001) suggested an alternative method in order to test the cointegration relationship. In this approach known as Autoregressive Distributed Lag (ARDL) approach, in contrary of the traditional cointegration tests, it doesn't need to classify the variables as *I(1)* or *I(0)*. This makes execution of pre-tests such as unit root test unnecessary. Since we work with the time series for which it is possible that it is not stable at the level such as the monetary aggregate and exchange rate, but stable at the level such as inflation rate, the ARDL approach is a proper model for the demand for money which we provided in the equation (1). The error correction version of ARDL model, including the variables in the equation (1), may be indicated as follows:

$$\Delta log(M_t) = \beta_0 + \sum_{i=1}^{n} \beta_{1,i} \Delta log(M_{t-i}) + \sum_{i=1}^{m} \beta_{2,i} \Delta log(Y_{t-i}) + \sum_{i=1}^{l} \beta_{3,i} \Delta(\pi_{t-i}) + \sum_{i=1}^{k} \beta_{4,i} \Delta log(E_{t-i}) + \alpha_1 \log(M_{t-1}) + \alpha_2 \log(Y_{t-1}) + \alpha_3(\pi_{t-1}) + \alpha_4 \log(E_{t-1}) + \varepsilon_t \quad (2)$$

As a result of estimation of this equation, the null hypothesis that there is no cointegration relationship (H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$) is tested using traditional *F* test against the alternative hypothesis that there is a cointegration relationship (H_1:$\alpha_1 \neq 0$, $\alpha_2 \neq 0$, $\alpha_3 \neq 0$, $\alpha_4 \neq 0$). Asymptotic distribution of traditional *F* test is not standard independent from the variables being *I(1)* or *I(0)*. Pesaran et al. (2001) presented a table related to the two groups of proper critical values. As it is assumed that all variables were integrated [*I(1)*] at the first level in the first of these groups, it is assumed that the integration [*I(0)*] was provided at the zero level in the other. In this case, a band including the all possible classifications of variables as *I(1)* and *I(0)* is provided. If the calculated *F* statistics is higher than the upper band, then the null hypothesis is rejected and it is concluded that there is a cointegration relationship. If the calculated *F* statistics is under the lower band, then the null hypothesis is not rejected and it is found that there is not any cointegration relationship. In the event that the *F* statistics is within the band, no conclusion may be reached. This testing process is called *Bound Test*.

III. Estimation Results

In our study, the period from 2002, when the inflation targeting regime was applied in the implementation of monetary policy, to the end of 2014 in Turkey is discussed using the monthly data. All data was obtained from the database of the Central Bank of the Republic of Turkey (CBRT). Accordingly, the null hypothesis that there isn't any cointegration relationship is tested against the alternative for January 2002 – December 2014 period in the study. At the first stage, the cointegration relationship is tested using the F statistics together with the new critical values that were mentioned before. According to Bahmani-Oskooee and Brooks (2003), the F test is affected by the lag number in the variables which their difference is taken. Therefore, the 2nd, 4th, 6th, 8th and 10th lags were considered for each of the first differenced variables in the equation (2). The conducted F test's results are given in the below Table 1. According to the table, since the F statistics is beyond the critical values at all lag levels, it is understood the existence of cointegration relationship between the monetary aggregate (M1 or M2) and income, inflation and exchange rate.

Table 1: Wald Test Results

Variable	Lag Order				
	2	4	6	8	10
M1	6,25	3,60	2,59	2,18	2,23
Marginal significance	(0,00)	(0,01)	(0,04)	(0,07)	(0,07)
M2	5,21	3,92	2,99	2,71	2,31
Marginal significance	(0,00)	(0,00)	(0,02)	(0,03)	(0,06)

At the second stage, Akiake Information Criterion (AIC) is used in order to determine the lag length for each first difference (Δ) variable in the equation (2). After the proper lag structure was determined, the equation (2) was estimated for the *M1* and *M2* monetary aggregates again and the obtained results were summarized in the Table 2 and Table 3. At this stage, assuming that the real monetary aggregate (*M1* and *M2*), income, inflation and exchange rate were cointegrated; the error correction form of the equation (2) was used. Thanks to this, the short-term dynamics in the model may be seen. Tables 2 and 3 consist of two parts each. In the part A, the coefficient estimations related to the lagged first difference variables in ARDL model (the estimations related to the short-term coefficients) are available. In the part B of tables, the estimations related to the long-term coefficients are available. Those values are the estimations related to the α_1, α_2, α_3 and α_4 coefficients in the ARDL model. These elasticity values related to the long-term demand for money were standardized dividing by ($-\alpha_1$) (Peasan et al., 2001).

Table 2: Estimation Results of ARDL (6,2,3,4) Model for M1 Demand for Money,

Short-term Coefficient Estimates				
Lag Level	Explanatory Variables			
	Δ *log (M1)*	Δ *log (Y)*	Δ (π)	Δ *log (E)*
0		-0,035 (2,22)	-0,001 (0,84)	0,129 (0,02)
1	-0,312 (2,05)	0,030 (0,24)	0,044 (3,57)	-0,041 (2,44)
2	0,157 (4,66)	0,823 (2,45)	0,127 (07,8)	0,211 (0,99)
3	0,547 (1,95)		-0,725 (4,87)	-0,429 (1,86)
4	0,376 (0,26)			-0,352 (3,37)
5	0,220 (3,32)			
6	0,127 (1,23)			

Long-term Coefficient Estimations					
	Constant	*log (Y)*	π	*log (E)*	ECT_{t-1}
Coefficient	-8,75	0,81	-0,55	0,68	-0,48
t-ratio	6,24	3,75	4,41	9,23	3,05
$AdjR^2$	0,88				
LM (2,134)	0,19 (0,82)				
RESET (1, 135)	2,88 (0,69)				

Note: Numbers in parenthesis beneath each coefficient show the absolute t ratio, next to coefficient indicate the marginal significance level

The income elasticity of demand for money is about 0.81 according to the part B of Table 2 and statistically significant according to the *t* statistics. The elasticity coefficient related to the inflation rate has a negative value (-0.55) conforming to our theoretical expectations. Since

the elasticity coefficient of exchange rate has a positive value, the demand for money increases, when the depreciation occurs in Turkish Lira. This validates the wealth effect argument which we discussed previously. On the other hand, the error correction coefficient is a coefficient which must theoretically have the negative sign and represents the speed of adjustment process. This coefficient having the negative sign shows that the process toward equilibrium regarding the M1 demand for money in Turkey is about 8 months.

Part B of the Table 2 also covers some diagnostic tests. The results of LM serial correlation test and RESET specification test in this part of the table indicate that there is not any serial correlation issue in the model and no specification error.

Table 3 summarizes the estimation results obtained for M2 demand for money. As seen in the part B of the table, the coefficient related to the error correction term is not valid statistically. In this case, the ARDL model related to the real M2 demand for money shows that there is not any cointegrating relationship among the relevant variables. So, it is not meaningful to evaluate the other coefficients in the table. When considering the diagnostic tests, the model has a serious serial correlation issue (LM test) and includes the specification error (RESET test). As a result of this, it appears that M1 monetary aggregate is a better monetary indicator in the formulation of monetary policy.

Table 3: Estimation Results of ARDL (3,1,1,2) Model for M2 Demand for Money

Short-term Coefficient Estimates				
Lag Level	Explanatory Variables			
	Δ *log (M2)*	Δ *log (Y)*	Δ (π)	Δ *log (E)*
0		0,551 (1,98)	0,001 (0,64)	0,085 (1,20)
1	-0,758 (5,22)	0,236 (0,88)	0,021 (1,53)	0,099 (3,71)
2	-0,014 (4,66)			0,113 (1,05)
3	-0,009 (0,83)			

Long-term Coefficient Estimates					
	Constant	*log (Y)*	π	*log (E)*	ECT_{t-1}
Coefficient	-17,21	3,19	0,88	0,18	-0,01
t-ratio	2,52	0,29	1,00	0,11	0,05
$AdjR^2$	0,63				
LM (2,134)	5,22 (0,01)				
RESET (1, 135)	8,24 (0,00)				

Note: Numbers in parenthesis beneath each coefficient show the absolute t ratio, next to coefficient indicate the marginal significance level

The existence of stable and determinable relationship between the demand for money and factors determining it is a necessary precondition in the implementation of monetary policy strategy toward targeting. Thus, the stability of long-term coefficients would be examined as the third stage in our study. As stated by Laidler (1993) and Bahmani-Oskooee (2001), the instability issue may arise from improperly modeling of short-term dynamics. For this reason, it is better to study the stability of long-term parameters including the short-term dynamics. For this purpose, CUSUM and CUSUMQ tests, which are mostly preferred in the literature, will be used. The calculated test statistics is transferred to the graphic in those tests that are applied to the residual terms obtained from the real M1 and M2 ARDL model, and these

statistics are showed with 5% significance levels. Below Figure 1 through 4 show the obtained test results.

Figure 1 CUSUM Test for M1 Demand

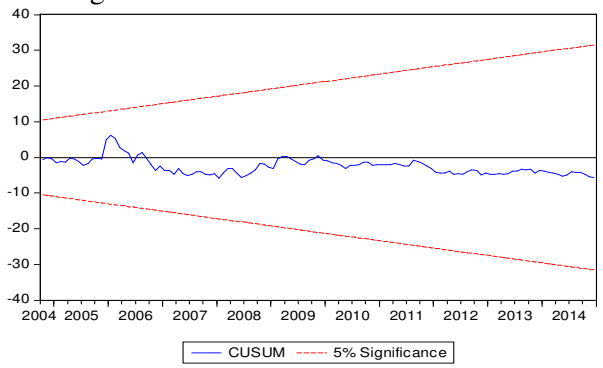


Figure 2 CUSUMSQ Test for M1 Demand

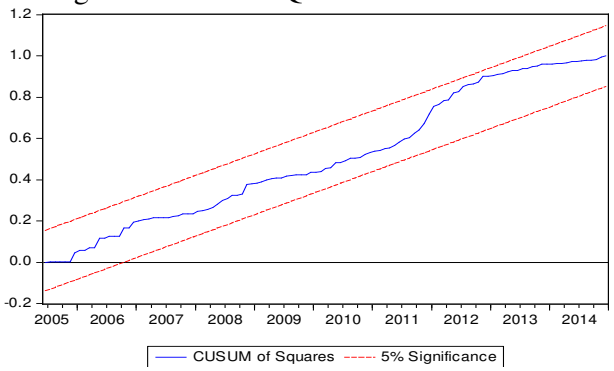


Figure 3 CUSUM Test for M2 Demand

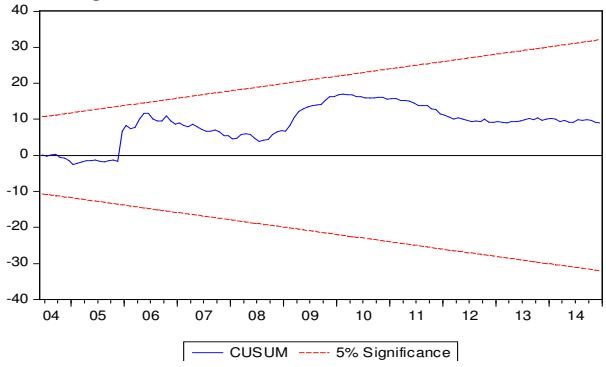
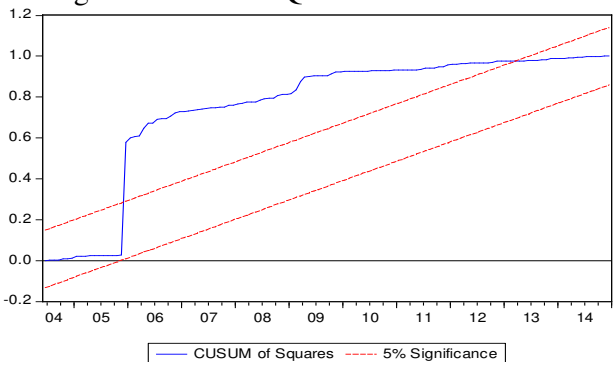


Figure 4 CUSUMSQ Test for M2 Demand



Since the calculated test statistics in the CUSUM and CUSUMQ graphs for M1 do not cross the critical value lines from above or bottom, but lie within the band, it is understood that the real M1 demand is stable. When the graph of CUSUMQ statistics, calculated for residuals obtained from M2 demand for money model, is studied (Figure 4), it is found that the critical values are interrupted and test statistics go beyond the band. This indicates an instability problem in the real M2 demand. When it is evaluated with the results that we obtained previously for M2, it is possible to say that the indicator which should be considered as the monetary aggregate of CBRT in the implementation of monetary policy is M1.

IV. Conclusion

In this study, the demand for money in Turkey was estimated using the ARDL approach to cointegration analysis. Since the ARDL approach doesn't need to have the knowledge about integration degrees of used variables, it is a proper method for analysis of cointegration relationship between the integrated time series from different degree.

The obtained results show that the income and exchange rate variables present a positive relationship with M1 demand, and the inflation rate affects the M1 demand in negative direction. Adverse effect of inflation rate on M1 demand supports the theoretical expectations that increase in the inflation rate would reduce the real demand for money. This represents that the economic units substitute the money balances with the real (physical) assets against the increase in the inflation rate. Positive effect of exchange rate on the real M1 demand indicates that the demand for money increases in case of domestic currency depreciation and the wealth effect is dominant.

Recent developments in cointegration analysis show that cointegration doesn't mean a stable relationship. As if the results obtained for M2 in this study support this view. The conducted stability tests show that as the real M1 demand for money is stable, the real M2 demand for money is instable. In this case, it is possible to say that the monetary aggregate that should be considered by CBRT as basis for formulating the monetary policy and implementing the monetary control function is M1.

Appendix*:* Data Used

All data used in the study is the data related to January:2002 – December:2014 period. All data is obtained via CBRT Electronic Data Distribution System. The data definition and coverage are as follows:

M1: Narrowly defined money stock (covers the currency in circulation and demand deposits in TL and foreign currency in the banking system including the participation banks)

M2: Broadly defined money stock (covers M1 and time deposits in TL and foreign currency in the banking system including the participation banks)
π: Inflation rate (monthly percentage change rate in the consumer price index (2003=100))
E: Exchange rate in USD/TL (defined as the value of one unit foreign currency in terms of domestic currency)
Y: Industrial production index (Since the GDP data in monthly basis is not available, 2010=100 basis industrial production index is used as a proxy variable in order to represent the scale variable)

References

Arango, S, Nadiri, M. I. (1981) "Demand for money in open economy, *Journal of Monetary Economics*; 7; 69-83.

Atkins, F. (2005), "Financial crises and money demand in Jamaica", Bindoeck Working Papers in Economics and Finance, University of London, 22p.

Bahmani-Oskooee, M. (2001), "How stable is M2 money demand function in Japan?", Japan and the World Economy 2001; 13; 455-461.

Bahmani-Oskooee, M, Brooks, T. J. (2003), "A new criteria for selecting the optimum lags in Johansen's cointegration technique", *Applied Economics*; 35; 875-880.

Bahmani-Oskooee, M, Rehman, H. (2005), "Stability of the money demand function in Asian developing countries", *Applied Economics*; 37; 773-792.

Bashier, A. and Dahlan, A. (2011), "The money demand function for Jordan: An Empirical Investigation", *International Journal of Business and Social Science,* Vol.2, No.5, 77-86.

Canova, L. (2006), "Estimating demand for money in Jamaica". MPRA Paper No.1023.

Chowdhury, Abdur R. (1997), "The Financial structure and the demand for money in Thailand", *Applied Economics*; 29; 401-409.

Egoumé-Bossogo, P. (2000), "Money demand in Guyana". Working Paper WP/00/19, International Monetary Fund.

Halicioglu, F. and Ugur, M. (2005), "On stability of the demand for money in a developing OECD country: the case of Turkey", *Global Business and Economics Review*, 7(2&3): 203 - 213.

Johansen, S. (1988), "Statistical analysis of cointegration vectors", *Journal of Economics Dynamics and Controls*; 12; 231-254.

Johansen, S, Juselius, K. (1990), "Maximum likelihood estimation and inference on cointegration: with applications to the demand for money", *Oxford Bulletin of Economics and Statistics*; 52; 169-210.

Khalid, A. M. (1999), "Modelling money demand in open economies: the case of selected Asian Countries", *Applied Economics*; 31; 1129-1135.

Khan, A. H. (1994), "Financial liberalization and the demand for money in Pakistan", *Pakistan Development Review*; 33; 997-1006.

Laidler, E. W. D. The demand for money: theories, evidence and problems, 4th edition, HarperCollins College Publishers: London.

Lungu, M., Simwaka, K., Chiumia, A., Palamuleni, A. and Jombo, W. (2012), "Money demand function for Malawi: implications for monetary policy conduct". *Banks and Bank Systems* Vol.7, No.1, 50-63.

Narayan, P. and Narayan S. (2008), "Estimating the demand for money in an unstable open economy: The case of the Fiji Islands". *Economic Issues,* Vol.13, No.1, 71.

Pesaran, M. H, Shin, Y, Smith, R. J. (2001), "Bounds testing approaches to the analysis of level relationships", *Journal of Applied Econometrics*; 16; 289-326.

Pradhan, B. K, Subramanian, A. (1998), "On the stability of the demand for money in India". *The Indian Economic Journal*; 45; 106-117.

Rao, B.B. and Kumar, S. (2007), "Structural breaks, demand for money and monetary policy in Fiji,' *Pacific Economic Bulletin*, 22, 54-62.

Rutayisire, M. J. (2008), *Liberalization, monetary policy and demand for money: 1980-2005.* National Bank of Rwanda, Research. The African Economic Research Consortium.

Sánchez-Fung, J. R. (2004), "Modelling money demand in the Dominican Republic", School of Economics Discussion Paper, *Kingston University*.

Sriram, S.S. (2001), Survey of literature on demand for money: Theoretical and empirical work with special reference to error-correction models Working Paper WP/99/64, International Monetary Fund.

Siklar, I. and Gerek, S. (2002), "Yuksek Enflasyon ve Para Talebi: Turkiye 1987 – 2000, Anadolu Universitesi Iktisadi ve Idari Bilimler Fakultesi Dergisi,

Siklar, E. (2002), Esbutunlesme Analizi ve Para Talebine Uygulanması, Anadolu Universitesi Yayınevi, 02/65, Eskisehir.

Watson, P. (2003), "Macroeconomic dynamics in Trinidad & Tobago: Implications for monetary policy in a very small oil-based economy". Department of Economics Working Papers, University of the West Indies.

Authors

Burhan Doğan, Department of Economics, Faculty of Economics and Administrative Sciences, Anadolu University, burhand@anadolu.edu.tr