IIIE Journal of Economics and Finance, 2020, 1(1)

Impact of Monetary and Other Economic Uncertainties on Demand for Money: Evidence from Pakistan

Shehla Gul1[1]and Ghulam Mustafa Sajid[2]

Abstract

The study investigates the impact of monetary and other economic uncertainties on demand for money for Pakistan in the short run as well as in the long run. To comprehend this objective the auto regressive distributed lag (ARDL) bounds testing approach and error correction model (ECM) developed by Pesaran et al. (2001) are employed to annual data for the period of 1970 to 2014. The empirical results reveal that in the short run both measures of uncertainty are significantly related to demand for money in Pakistan. Whereas, in the long run monetary uncertainty does not influence money demand while other economic uncertainties have long run negative impact on demand for money. The results also indicate that there is long-run relationship between demand for money and other factors considered in the analysis. The findings of ECM supports co-integration among the variables and that the dependent variable adjusts towards equilibrium level with the speed of 51 percent per year. To check the stability of money demand function in the presence of monetary and other economic uncertainties, CUSUM and CUSUMSQ tests are applied to the residuals of the model. The findings of both tests confirm the stability of long run money demand function for Pakistan.

JEL Classification: E41; E42; E52

Keywords: Demand for money; monetary uncertainty; stability; economic uncertainty

1. Introduction

Money demand has a crucial role both in macroeconomics and monetary economics. In macroeconomics, it has a general impact through transaction, speculation and precautionary motives while in monetary economics it

[1]International Institute of Islamic Economics, International Islamic University, 44000 Islamabad, Pakistan, email: khan.shehla1@yahoo.com

[2]International Institute of Islamic Economics, International Islamic University, 44000 Islamabad, Pakistan, email: ghulammustafa@iiu.edu.pk

has a specific role to play regarding the performance of monetary policy. According to the perception of conventional economics, real demand for money is a function of income and interest rate. The rise in income has the tendency to enhance money demand while the increase in rate of interest declines the desire of economic agents to keep money with them. Monetary uncertainty is also a determinant of money demand which has positive impact on demand for money (Friedman (1984)). When supply of money becomes more uncertain, people raise their demand for money and velocity of money declines. Economic uncertainty is another important determinant of money demand highlighted in the literature (Bahmani-Oskooee & Xi, 2011). The impact of economic uncertainty on money demand is uncertain. It can be positive as in the period of high economic uncertainty a risk averse agent prefers to hold safe and liquid assets. It can be negative in the sense that if monetary value is expected to decline in future due to economic uncertainty, then the economic agents are expected to prefer holding of other assets such as gold and commodities instead of risky assets. Therefore the omission of uncertainty variables from money demand model can result in invalid conclusions which can also influence the monetary policy planning. Thus it is important to include economic and monetary uncertainty variables in money demand equation. The prevailing literature points to the fact that considerable attention has been paid to the investigation of money demand function and its determinants in emerging economies like Pakistan since 1970. However, these earlier studies on demand for money examined just the very common determinants by applying different techniques and have ignored the role of uncertainties as determinants of money demand in Pakistan.

This study is an attempt to fill this gap in the literature on money demand function in Pakistan. Hence the study inclined to revisit the demand for money function in Pakistan by adding two more factors i.e. monetary uncertainty and economic uncertainty. The study also contributes to the available literature on demand for money in Pakistan by investigating whether monetary uncertainty and economic uncertainty along with real income, price level, interest rate and exchange rate plays any role in the stability of monetary aggregate M2 in Pakistan. This study aims to appraise the demand for money function of Pakistan for the time period of 1970 to 2014. To accomplish this aim, the study applies the error correction representation of ARDL model. The stability of money demand function is checked by applying CUSUM and CUSUMSQ tests to the residuals of the model.

The rest of the study is organized as follows. Section 2 reviews literature on the issue. Section 3 contains model specification and estimation technique. Source of data, variable description and construction are discussed in section 4. Section 5 interprets the empirical results. The last section presents conclusions of the study.

2. Literature Review

In 1982 there was a huge decline in income velocity of money which causes real GNP to fall in USA. According to Friedman's volatility hypothesis (1984) this decline in velocity was due to increase in volatility of money supply because of announced variations in the operating techniques of Federal Reserve in October 1979. Whenever money supply becomes more volatile the demand for money increases and velocity declines which in turn reduces GNP (Hall & Noble, 1987). Friedman's volatility hypothesis failed in case of Germany (Bruggemann & Nautz, (1997)), Oskooee and Bohl (2000)) while it did hold for the USA (Choi & Oh, 2003).

Both monetary and economic uncertainties are important determinants of money demand. It is evident from the evidence found by Hun Lee and Chung (1995), Bahmani-Oskooee and Bahmani (2014) for Korea, Jackman (2010) and Atta-Mensah (2004) for Canada, Oskooee et al. (2012) for China, Oskooee and Xi (2014) for six Asian countries[3], Kones (2014) for 21 African countries[4], Kiptui (2014) for Kenya. The studies conducted on different Asian countries such as Ibrahim (1998, 2001) for Malaysia, Khan (1992) for India and Pakistan, Baharumshah et al (2009) for China, Kundu and Mollah (2014) for Bangladesh, Ajmi et al. (2015) for ten Asian countries[5], Apergis, (2015) for East Asian countries, Tang (2007) for five countries of South Asia i.e. Indonesia, Singapore, Malaysia, Philippine and Thailand, proved that the long run demand for money function was stable for these Asian countries.

A number of studies also estimated money demand function for Pakistan by applying different techniques and got diverse results such as Khan (1982) examined the demand for money function in six developing nations of Asia. A significant relationship of expected inflation rate with money demand was found for Pakistan, Korea and Sri Lanka. The study also suggested

[3]Malaysia, Indonesia, Singapore, Pakistan, India and Philippine

[4]Burundi, Cote d'Ivoir, Burkina Faso, Cameroon, Ethiopia, Gabon, Egypt, Ghana, Kenya, Morocco, Niger, Madagascar, Nigeria, Senegal, Mauritius, Seychelles, Rwanda, Sierra Leone, Tanzania, South Africa, and Togo.

[5]Malaysia, Singapore, Indonesia, Korea, Japan, India, China, Philippines, Fiji and Hong Kong

that interest rate has a considerable role in determining the opportunity cost of holding money in Pakistan. Nisar and Aslam (1983) also observed the same results regarding significance of interest rate for Pakistan. Khan and Sajjid (2005) investigated a long run stable relationship between demand for money and real variables i.e. rate of inflation, real income, foreign interest rate, and real effective exchange rate. Haider et al. (2013) also discovered a stable money demand function for Pakistan. Other studies which examined money demand function for Pakistan includes "Akhtar (1974), Abe et al. (1975), Mangla (1979), Khan (1980,1982), Nisar and Aslam (1983), Sarwar et al. (2010), Azim et al. (2010), Qayyum (2001, 2005), Khan and Sajjid (2005), Omer (2009), Anwar and Asghar (2012), Mall (2013), Naseer (2013) , Faridi and Akhtar (2013), Haider et al. (2013)". A common feature of all these studies is that they analyze the relationship of money demand with its determinants by applying different techniques. Most of these studies also checked the stability of money demand function for Pakistan using CUSUM and CUSUMSQ tests.

2.1 Literature Gap

The literature reviewed above make it clear that no study[6] has been conducted on Pakistan by considering uncertainties (monetary and other economic). Therefore this study estimates the relationship of money demand with monetary and other economic uncertainties and also checks the impact of these uncertainties on the stability of money demand for Pakistan.

3. Model Specification

Real or nominal GDP, price level, interest rate and exchange rate are considered as main determinants of money demand in every country. Money demand function for Pakistan has no exception. Therefore we identify the demand for money function which relates the demand for broad money M2 to real GDP, nominal effective exchange rate, price level, interest rate and two measures of uncertainty (monetary and economic). The leading model of money demand for Pakistan is presented in equation (1) which is a standard specification:

[6]Bahmani-Oskooee (2014) conducted a study on Asian countries including Pakistan similar to our study. but we started work independent of it and it was not available on internet at that time. Our study is different in one aspect; we measure economic uncertainty by an index of five variables, while Bahmani-Oskooee (2014) measured it by a single variable (GDP).

$$LM_t = \beta_\circ + \beta_1 LY_t + \beta_2 LP_t + \beta_3 R_t + \beta_4 LEX_t + \beta_5 V_t + \beta_6 EU_t + \varepsilon_t \quad (1)$$

L is the log of variables.

The equation (1) states that real money demand is the function of real GDP, price level, interest rate, nominal effective exchange rate and two uncertainty variables (monetary and economic). V represents monetary uncertainty while EU is economic uncertainty index. Following the literature, the sign of β_1 and β_2 are anticipated to be positive, β_3 to be negative. β_4 could be positive or negative depending on the value of exchange rate. Increase in exchange rate reflects decline in the home currency value. Thus with the rise in exchange rate the value of overseas possessions in the form of home currency increases, that is rise in the value of assets, which may give rise to money demand. However if there is an expectation of further decline in value of currency, it may lead to increase in demand for foreign currency or decrease in demand for domestic currency. β_5 and β_6 could take any sign. If a measure of uncertainty persuades people to be more careful and to hold more liquid assets, value of coefficients will be positive. However, if any measure of uncertainty (monetary or economic) creates substitution effect so that people move away from holding cash towards less volatile assets then the signs of β_5 and β_6 can be negative.

In order to estimate the short run and the long run coefficients equation (1) is transformed into error correction format. Thus, following the ARDL bound testing approach of Pesaran et al. (2001), we have the following equation:

$$\begin{aligned}\Delta LnM_t = \alpha_\circ + \sum_{i=1}^{n} \alpha_1 \Delta LM_{t-i} + \sum_{i=0}^{n} \alpha_2 \Delta LY_{t-i} + \sum_{i=0}^{n} \alpha_3 \Delta LP_{t-i} + \sum_{i=0}^{n} \alpha_4 \Delta LEX_{t-i} + \\ \sum_{i=0}^{n} \alpha_5 \Delta r_{t-i} + \sum_{i=0}^{n} \alpha_6 \Delta V_{t-i} + \sum_{i=0}^{n} \alpha_7 \Delta EU_{t-i} + \rho_\circ LM_{t-1} + \\ \rho_1 LY_{t-1} + \rho_2 LP_{t-1} + \rho_3 LEX_{t-1} + \rho_4 r_{t-1} + \rho_5 V_{t-1} + \rho_6 EU_{t-1} + \varepsilon_t\end{aligned} \quad (2)$$

The 2nd equation is the error correction representation of ARDL model. This is a bit different from the standard error correction model in the sense that all variables from equation (1) are included in equation (2) in their lagged level form instead of including lagged error term. This specification is mostly favored by Pesaran et al. (2001) because by estimating equation (2) the short run and long run effects of variables can be found in one step

estimation. The estimates of the coefficientsα_1, α_2, ….α_7, reflects the short run effects whileρ_1, ρ_2, …, ρ_6 normalized by ρ_0 reflects the long run effects. However, in order to make estimates of the long run coefficients meaningful, there is need to check co-integration among the variables.

To establish co-integration Pesaran et al. (2001) proposed a nonstandard F test (also called bound test), which has new critical values for joint significance of lagged level variables. They provide the upper bound and lower bound critical values. For the existence of co-integration among variables, the calculated F statistics should be greater than the upper-bound critical value. However if the test statistics lies below the lower bound then the null hypothesis of no co-integration is accepted. If the test statistic lies between the upper and lower bounds, the results are considered as inconclusive. Co-integration is checked by applying F-test on the output of equation 2. Equation (1) is estimated to get the residuals which are further used as error correction term. Equation (2) is re-estimated by replacing the variables representing long run relationship (lagged level variables) with the lagged error correction term. The estimated value of error correction term will provide evidence for co-integration among variables and also shows the adjustment of variable towards equilibrium only if it has significantly negative value.

4. Source of Data, Description and Construction of Variables

Annual data for the period of 1970 to 2014 are collected from different issues of Economic Survey of Pakistan, annual reports of the State Bank of Pakistan and International Financial Statistics (IFS). Detail of variables is given bellow:

M2= real money supply. Its data is obtained from annual reports of SBP.

Y= GDP at constant market prices. The data is taken from economic survey of Pakistan.

P= log of CPI. CPI data is also obtained from economic survey of Pakistan

EX= nominal effective exchange rate. It is defined as the value of dollar in terms of rupee. Its data is taken from IFS.

R= interest rate as Govt bond yields. Its data is also taken from IFS.

V= monetary volatility. It is estimated by applying GARCH (1,1) technique on monthly data of nominal M2. Monthly data of nominal M2 is taken from monthly bulletins of the State Bank of Pakistan. The volatility calculated from monthly data of M2 is then converted into annual volatility by taking the average of every 12 monthly observations.

EU= economic uncertainty index. It is the index of five variables which are; government expenditures, exports, imports, foreign remittances and foreign direct investment (FDI). Volatility of variables is calculated by taking the standard deviation of each five observation through rolling method. The index is then constructed by putting values in the formula:

$$EU = \sum_{i}^{n} \gamma_i \left(\frac{(V_i - \overline{V_i})}{\delta_v}\right)$$

where V_i shows the volatility of variable 'i', $\overline{V_i}$ is the average volatility, δ_v δ_v is the standard deviation of volatility and γ_i represents the actual weights attached to each factor.

5. Discussion and Interpretation of Results

One of the preconditions of ARDL model is that, none of the variables should be I(2) and It can be used with a mixture of I(0) and I(1) variables. Therefore the Augmented Dickey Fuller (ADF) unit root test is applied to all variables both at level and first difference to check time series properties of variables. The results of the test are reported in table 1. Which indicates that all variables are stationary at first difference except interest rate which is stationary at level I(0). The results also shows that no one of the variables is I(2). Thus it provides the validation for ARDL bound testing approach to be used for examining the determinants of money demand for Pakistan.

Table 1: Results of ADF Test

Null hypothesis: There is unit root in the data

At level	Optimal lags	t-statistics	At first difference	Optimal Lags	t-statistics
LM2	0	-0.2567	DLM2	0	-5.3597***
LY	0	-1.2106	DLY	0	-4.7118***
LP	1	-1.1902	DLP	0	-3.3595**
LEX	0	-2.0640	DLEX	0	-5.0113***
R	1	-3.2916**	DR	1	-5.7099***
V	0	-1.9770	DV	0	-4.6227***
EU	0	-1.6036	DEU	0	-5.6549***

Note: *** and ** represents significant at 1% and 5% level of significance respectively

The first step in application of error correction model is the optimal lag selection for each variable. First we impose 3 lags on each first differenced

variable and just one lag on level variables and estimate the equation. The insignificant lags are dropped out one by one through Schwarz Criteria (SC). The short run coefficients are reported in table 2 while the table 3 reports long run estimates of ARDL model. It is clear from table 2 that at least two coefficients of each variable are significant which means that monetary and economic uncertainties along with all other variables have short run significant impacts on money demand. The same result was found by Bahmani- Oskooee et.al (2012) for China and Choi and Oh (2003) for USA.

Table 2: Estimates of Short-Run Coefficient

	Lag Order			
Variables	0	1	2	3
DLM2	– –	0.3859*** (3.91)	0.2192*** (3.16)	0.2813*** (3.98)
DLY	1.3318*** (4.65)	1.2532*** (3.69)	2.1676*** (6.42)	1.3014*** (4.53)
DLP	-0.836*** (6.04)	0.9120*** (6.47)	– –	-0.2881 (1.36)
DLEX	-0.170*** (3.199)	– –	– –	0.4521*** (7.37)
DR	-0.002 (1.01)	0.0157*** (5.52)	0.0052* (2.03)	0.0179*** (8.38)
DV	-0.003** (2.53)	0.0022*** (3.19)	– –	0.0010 (1.79)
DEU	-0.001** (2.24)	0.0005 (1.34)	0.0021*** (7.75)	0.0016*** (5.50)

Note: *, **and *** represents significant at 10%, 5% and 1% level of significance respectively
Figures in parenthesis represent t-statistics value

Table 3 shows that coefficients of all variables except monetary uncertainty are significant and have their expected signs. The real GDP and price level have positive signs which are according to economic theory.

Table 3: Estimates of Long run Coefficients

Variables	Coefficients	t-statistics	p-value
C	8.5394	4.6569	0.0009
LY	0.3479	2.413	0.0365
LP	0.4479	5.204	0.0004
LEX	-0.2327	5.523	0.0003
R	-0.0173	3.903	0.0029
V	0.0014	1.206	0.2557
EU	-0.0019	3.398	0.0068

R-squared= 0.99 Adjusted R-squared= 0.97 F-statistic= 40.08
Prob(F-statistic)= 0.000 Durbin-Watson stat= 2.078

The findings of the study are consistent with the findings of almost all studies conducted on money demand for Pakistan and other countries such as Akhtar (1974), Hun Lee and Chung (1995), Ibrahim (1998, 2001) Choi and Oh (2003), Atta-Mensah (2004), Qayyum (2001, 2005), Anwar and Asghar (2012), Naseer (2013), Bahmani-Oskooee and Bahmani (2014), Bahmani-Oskooee et.al (2012) and Apergis (2015).

The other variables such as R, EX and EU are negatively related to demand for money. The reason for the inverse relation between exchange rate and money demand may be that a rise in EX indicates decrease in value of domestic currency (M2) due to which demand for M2 declines. People convert their holdings (in the form of M2) into foreign assets due to expectations of further decline in the value of domestic currency. Similarly whenever interest rate gets higher, the returns on saving deposits and other assets increases which in turn raises the opportunity cost of holding money. Therefore people prefer to hold alternatives to money and hence demand for money declines. This is consistent with theory and in line with the findings of Mangla (1971), Ibrahim (2001), Inoue and Hamori (2008) and Kiptui (2014) for different countries. All these studies found that both interest rate and nominal exchange rate have significant but inverse relationship with money demand. However the relationship of monetary uncertainty with money demand is statistically insignificant for Pakistan in the long run. This result is consistent with the results of Oskooee and Wang (2014), Kones (2014). The reason for insignificant coefficient of monetary uncertainty can be the less

volatile behavior of M2 money supply in Pakistan. The less volatile behavior is predicted from very small values of volatility series for money supply calculated through GARCH technique.

The negative and small value of coefficient of economic uncertainty means that although its impact on money demand is negative but very small in case of Pakistan. The inverse relationship of economic uncertainty with demand for money is supported by the findings of Bahmani-Oskooee and Xi (2014) for Malaysia and Indonesia. However, to make these long run coefficients meaningful it is necessary to establish co-integration among these variables. Therefore we move towards Table 4.

Table 4: Results of Diagnostic Tests

F-statistic	ECM_{t-1}	Adj R^2 R^2	LM	CUSUM	CUSUMSQ
25.9206	-0.5123 (3.68)	78.60	4.8465 (0.09)	Stable	stable

The ARDL bound test result shows that the value of F-statistic is much higher than upper bound critical value (3.61). Therefore the hypothesis of co-integration among variables is accepted.

Next, we run the regression of real demand for money on its determinants at level to get the error correction term. The lagged level variables are then replaced with the lagged level error correction term (EC_{t-1} C_{t-1}). The resultant equation is re-estimated. A negative significant value of error correction term is obtained which indicates the adjustment of money demand towards equilibrium at the speed of 51% per year. The value of Long-range multiplier (LM) test is also reported in the table which is applied to check serial-correlation. The LM statistics is much smaller than the critical value 9.48, which is an evidence of no serial correlation in the residuals.

One of the objectives of the study is to check the stability of money demand function for Pakistan in the presence of uncertainties variables. Therefore after estimating the money demand function, we check its stability with the help of CUSUM and CUSUMSQ tests proposed by Brown et.al (1975). The results of the tests are presented in figure 1 and 2. The dotted straight lines in both figures signify the critical bounds at 5% level of significance. Both figures show that money demand function is stable even

with the introduction of two new variables in the model because the test lines lie inside the critical bounds.

Figure 1: CUSUM test to the residuals of equation (2)

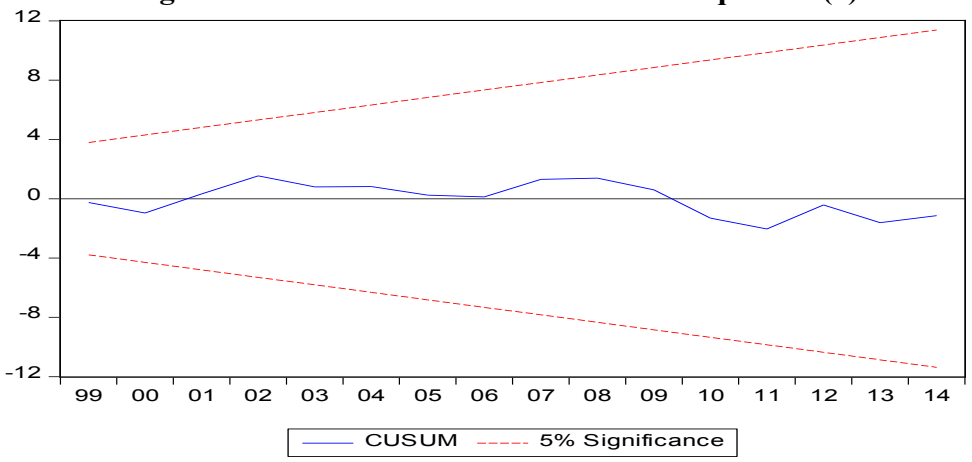
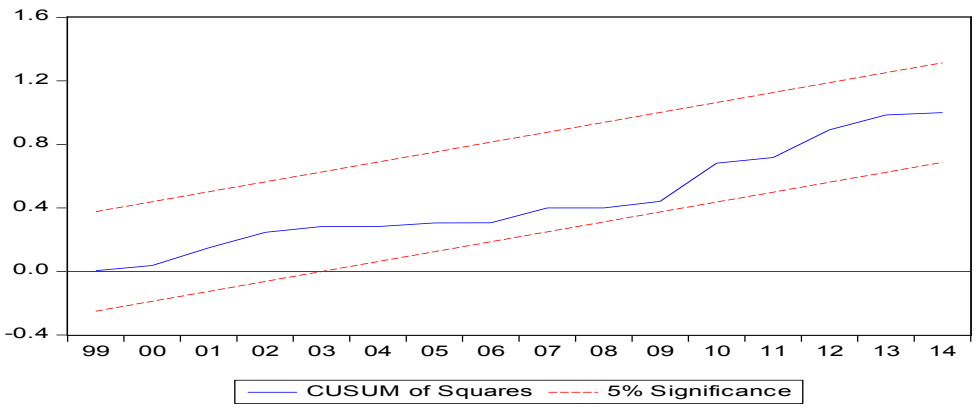


Figure 2 CUSUMSQ test to the residuals of equation (2)



6. Conclusion

The demand for money in any country depends upon the price level, real income, opportunity cost variable and the exchange rate. However, the monetary and economic uncertainties are also considered as the important variables affecting demand for domestic currency. Both the variables can have a positive or negative relationship with the demand for money. The purpose of this study is to investigate the impact of monetary and other economic

uncertainties on the demand for money in Pakistan. For this purpose the money demand function was estimated by applying ARDL bound testing approach of Pesaran et al. (2001). The monetary uncertainty was calculated through GARCH model while economic uncertainty was obtained through standard deviation. It is concluded that both measures of uncertainty are significantly related to demand for money in the short run. But in the long run only economic uncertainty has significantly negative impact on money demand, while monetary uncertainty has no effect on demand for money in the long run for Pakistan. The negative impact of economic uncertainty justifies the substitution effect due to which people move away from holding cash towards less volatile assets. In addition to it, it is also concluded that money demand function is stable for Pakistan even in the presence of both uncertainty variables (monetary and other economic uncertainties).

References

Abe, S., Fry, M. J., Min, B. K., Vongvipanond, P., & Yu, T. P. (1975). The demand for money in Pakistan: Some alternative estimates. *The Pakistan Development Review*, *14*(2), 249-257.

Ajmi, A. N., Apergis, N., & Montasser, G. E. (2015). Old wine in a new bottle: money demand causality for 10 Asian countries. *International Journal of Emerging Markets*, *10*(3), 491-503.

Akhtar, M. A. (1974). The demand for money in Pakistan. *The Pakistan Development Review*, *13*(1), 4-54.

Anwar, S., & Asghar, N. (2012). Is demand for money stable in Pakistan? *Pakistan Economic and Social Review*, 50(1), 1-22.

Apergis, N. (2015). Long-run estimates of money demand: new evidence from East Asian countries and the presence of structural breaks. *Applied Economics*, *47*(31), 3276-3291.

Atta-Mensah, J. (2004). *Money demand and economic uncertainty*. Bank of Canada. Working paper 2004-25

Azim, P., Ahmed, N., Ullah, S., Zaman, B. U., & Zakaria, M. (2010). Demand for money in Pakistan: an Ardle Approach. *Global Journal of Management and Business Research*, *10*(9), 76-80.

Baharumshah, A. Z., Mohd, S. H., & Masih, A. M. M. (2009). The stability of money demand in China: Evidence from the ARDL model. *Economic systems*, *33*(3), 231-244.

Bahmani-Oskooee, M., & Bahmani, S. (2014). Monetary uncertainty and demand for money in Korea. *Asian Economic and Financial Review*, *4*(3), 317-324.

Bahmani-Oskooee, M., & Bohl, M. T. (2000). German monetary unification and the stability of the German M3 money demand function. *Economics letters*, *66*(2), 203-208.

Bahmani-Oskooee, M., Xi, D., & Wang, Y. (2012). Economic and monetary uncertainty and the demand for money in China. *Chinese Economy*, *45*(6), 26-37.

Bahmani-Oskooee, M., & Xi, D. (2011). Economic uncertainty, monetary uncertainty and the demand for money in Australia. *Australian Economic Papers*, *50*(4), 115-128.

Arize, A. C., Spalding, J. B., & Umezulike, B. N. (1991). Impact of foreign monetary developments on demand for money: regression estimates and forecast results. *Journal of Economic Studies*, *18*(2), 39-48.

Bahmani-Oskooee, M., & Xi, D. (2014). Economic uncertainty, monetary uncertainty, and the demand for money: Evidence from Asian countries. *Australian Economic Papers*, *53*(1-2), 16-28.

Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society. Series B (Methodological)*, 37(2), 149-192.

Brüggemann, I., & Nautz, D. (1997). Money growth volatility and the demand for money in Germany: Friedman's volatility hypothesis revisited. *Review of World Economics*, *133*(3), 523-537.

Cheong Tang, T. (2007). Money demand function for Southeast Asian countries: an empirical view from expenditure components. *Journal of Economic Studies*, *34*(6), 476-496.

Choi, W. G., & Oh, S. (2003). A money demand function with output uncertainty, monetary uncertainty, and financial innovations. *Journal of Money, credit, and Banking*, *35*(5), 685-709.

Faridi, M. Z., & Akhtar, M. H. (2013). An Estimation of money demand function in Pakistan: Bound Testing Approach to Co-integration. *Pakistan Journal of Social Sciences (PJSS)*, *33*(1).

Friedman, B. M. (1984). Lessons from the 1979-1982 monetary policy experiment. *American Economic Review*, 74(2), (May 1984), 382-387.

Haider, A., Jan, A., & Hyder, K. (2013). On the (Ir) relevance of monetary aggregate targeting in Pakistan An eclectic view, http://121.52.153.179/JOURNAL/LJE_Vol_17-SE_PDF/TitleV17-SE.htm.

Hall, T. E., & Noble, N. R. (1987). Velocity and the variability of money growth: Evidence from Granger-Causality tests: note. *Journal of Money, Credit and Banking*, *19*(1), 112-116.

Lee, T. H., & Chung, K. J. (1995). Further results on the long-run demand for money in Korea: a cointegration analysis. *International Economic Journal*, *9*(3), 103-113.

Ibrahim, M. H. (1998). An econometric analysis of money demand and its stability in the Malaysian economy. *Indian Economic Review*, 3(1), 53-66.

Ibrhim, M. H. (2001). Financial factors and the empirical behavior of money demand: a case study of Malaysia. *International Economic Journal*, *15*(3), 55-72.

Inoue, T., & Hamori, S. (2008). An empirical analysis of the money demand function in India. *Institute of Developing Economies Discussion Paper*, *166*.

Jackman, M. (2010). Money demand and economic uncertainty in Barbados. *The Empirical Economics Letter*, 10(May 2011), 1-15

Khan, A. H. (1980). The demand for money in Pakistan: Some further results. *The Pakistan Development Review*, 19(1), 25-50.

Khan, A. H. (1982). Permanent income, inflation expectations and the money demand function in developing countries. *The Pakistan Development Review*, 21(4), 259-273.

Khan, I. N. (1992). The demand for money in Pakistan & India. *Pakistan Economic and Social Review*, 30(2), 181-190.

Khan, M. A., & Sajjid, M. Z. (2005). The exchange rates and monetary dynamics in Pakistan: An Autoregressive Distributed Lag (ARDL) Approach. *The Lahore Journal of Economics,* 10(2), 87-99.

Kiptui, M. C. (2014). Some empirical evidence on the stability of money demand in Kenya. *International Journal of Economics and Financial Issues*, *4*(4), 849.

Kundu, N., & Mollah, M. M. H. (2014). *Empirical approaches to the Post-Keynesian theory of demand for money: An error correction model of Bangladesh* (No. 65727). University Library of Munich, Germany.

Kones, A. (2014). *Impact of monetary uncertainty and economic uncertainty on money demand in Africa* (Doctoral dissertation, The University of Wisconsin-Milwaukee).

Mall, S. (2013). Estimating a function of real demand for money in Pakistan: An application of bounds testing approach to cointegration. *International Journal of Computer Applications*, *79*(5), 32-50.

Mangla, I. U. (1979). An annual money demand function for Pakistan: Some further results. *The Pakistan Development Review*, 18(1), 21-33.

Naseer, M. A. (2013). Demand for money in Pakistan. *African Journal of Business Management*, *7*(42), 4306-4310.

Nisar, S., & Aslam, N. (1983). The demand for money and the term structure of interest rates in Pakistan. *The Pakistan Development Review*, 22(2), 97-116.

Omer, M. (2009). Stability of money demand function in Pakistan. *SBP Research Bulletin*, 6(2), 1-38

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3), 289-326.

Qayyum, A. (2005). Modelling the demand for money in Pakistan. *The Pakistan Development Review*, 44(3), 233-252.

Qayyum, A., & Nishat, M. (2001). Sectoral analysis of the demand for real money balances in Pakistan [with Comments]. *The Pakistan Development Review*, 40 (4), 953-966.

Sarwar, H., Hussain, Z., & Sarwar, M. (2010). Money demand function for Pakistan (Divisia Approach). *Pakistan Economic and Social Review*, 48(1), 1-20.