5. ARE THE DETERMINANTS OF MONEY DEMAND STABLE IN SELECTED COUNTRIES FROM SOUTHEASTERN EUROPE?

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Abstract

The purpose of this article is to examine the long and short-run determinants of money demand (M1) and their stability in the seven Southeast European (SEE) countries using monthly data from January 2005 to December 2014. The Pool Mean Group Estimation of ARDL was used to find the long-run and short-run dynamic relationships in money demand model. Empirical results provide the evidence that index of industrial production, exchange rate and dummy variable of effect of the European debt crisis explain the most variations of money demand in the long-run, while exchange rate is significant only in short-run. Our findings also show that real money demand in the SEE countries, despite their turbulent transition from socialist to market economy, was relatively stable in the analyzed period.

Keywords: money demand, determinants, Southeast Europe, panel ARDL
JEL Classification: C12, C33, E41

I. Introduction

Effective and stable money demand estimations are the precondition for the monetary authorities to design an effective monetary policy. The importance of the money demand function has encouraged a wide range of economists to empirically study its determinants. But, while the money demand literature has focused on developed countries, there have been relatively few studies examining the money demand function in transition economies and especially in SEE countries.

The relative absence of empirical money demand studies for SEE economies, is usually explained by the instability of the transition process itself, and with concerns over the lack of available data on selected determinants of money demand over longer periods of time (Payne, 2003). Although economies of the SEE countries improved markedly over the beginning of the last decade; they faced significant challenges since the global financial

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crisis began in 2008, and continued with the European debt crisis, from 2011. These factors are suspected to contribute to the stability/instability of money demand function in SEE countries. Estimating a stable money demand function is essential for the central banks from SEE countries with respect to their targets of sustainable growth and price stability.

Considering narrower concept of money supply – M1 as a measure for money in the selected countries, our research adds to a growing literature by determining the variables of money demand in the selected countries from SEE. We focused on seven countries from Southeast Europe (Albania, Bosnia and Hercegovina, Bulgaria, Croatia, Macedonia, Serbia and Romania), using monthly data, for the period 2005- 2014. The sample has been chosen because these countries are relatively homogenous, with common history and similar institutions and economies.

The analysis of this study will contribute to the existing level of knowledge in several ways. First, it will give new insights into the origins, characteristics and consequences of long and short determinants and their stability in SEE economies as a whole. Namely, most studies focus on individual country cases and according to the knowledge of the authors there are none for this region. This is an initial effort to reveal the parameters that govern this key relationship in economics

Second, some of the existing panel studies (Kumar et al. 2010; Nautz and Rondorf, 2010) usually considered only several variables (e.g. income, prices and a measure of the opportunity costs), in the money demand equation. But, in the period of transition exchange rate can also play a crucial role in explaining money demand. Namely, during periods of high inflation, the countries in our study experienced a partial replacement of domestic with foreign currencies, either as a store of value or as a medium of exchange. Also, all selected countries from SEE are "small" open economies, and the foreign trade liberalization during the transition process has therefore, affected countries behavior with respect to their demand of foreign and domestic financial assets. These countries could switch more easily between foreign and domestic currencies. This may have affected the money holdings in these economies. The exchange rate on money demand is also important for these countries in view of the fact that they are tending to join the euro area sometime in the future and are likely to focus on minimizing the volatility of the domestic currency value against the euro. Therefore, the exchange rate might become an important factor explaining money demand behavior in these countries and will be used in the analysis.

Third, compared to previous studies, this paper uses a newly developed econometric technique known as panel ARDL model or Pooled Mean Group (PMG) estimation proposed by Pesaran et al. (1999). This model is able to capture the long-run and short-run relationship among the variables of interest, and also to examine the dynamic effects of selected variables on money demand.

Also, in this study we will include two dummy variables, the global economic crisis from 2008/2009 and current European debt crisis. We think that these two dummy variables will be an important factor for explaining money demand behavior. According to the knowledge of the authors, there has been only one study Kjosevski (2013) that has used global crisis 2008/2009 and the European debt crisis 2011/2012 in his model of money demand.

The structure of the paper is as follows. After the Introduction, Section 2 reviews the literature on empirical findings relevant to the determinants of money demand. The sources of the data employed as well as methodology are presented in Section 3. Section 4 presents the empirical results and section 5 concludes the paper and gives policy recommendation.

II. Literature Review

A considerable body of literature has investigated the demand for money both in developing countries Omotor (2009) and in developed countries (Beyer 1988; Brand and Cassola 2000; Calza, et al. 2001). But, there are only several papers on money demand in SEE countries (Anusic 1994; Sonje 1999; Babic 2000; Maravić and Palić 2005; Karla, 1998; Kjosevski, 2013).

Maravić and Palić (2005) examined the long-term and short-term money demand in Serbia for the period from January 1996 to March 2005 applying Johansen cointegration technique and the VECM model. The results of their study indicate that real money M1 has a strong cointegration relationship with economic activity, interest rate on dinar deposits and inflation. Furthermore, the results of the VECM model show that inflation and exchange rate were the most important determinants of money demand, while interest rate on deposits in dinars, were statistically insignificant in the short term.

Among the first analyses that explore the demand for money in Croatia are Anusic (1994) Sonje (1999), and Babic (2000). Anusic (1994) used an ordinary least squares method for the period from January 1991 to November 1993. His study indicates that in the period of hyperinflation in Croatia inflation and GDP were the main determinants of the demand for money. The results also show that interest rate had no significant impact on the demand for money in the analyzed period. On the other hand, Sonje (1999), analyzed money demand in the period after hyperinflation, offering empirical evidence that inflation no longer had a significant effect. Babic (2000) also suggests that inflation is statistically insignificant variable and has no influence on the demand for money in Croatia.

Karla (1998) estimates relationship between money, inflation, prices, exchange rate, and interest rate in Albania during 1993-1997 using parsimonious error correction model. She finds that in the long run there is a positive relationship between the price level and the exchange rate, and between real money demand and exchange rate expectations, interest rates and the level of economic activity

Kjosevski (2013) applies Johansen cointegration technique and VECM model to estimate the money demand in the Republic of Macedonia using monthly data from January 2005 to October 2012. The empirical results in his paper provide evidence that exchange rate and interest rate payable on dinar time deposits up to one month explain the most variations of money demand in the long-run, while interest rate is significant only in short-run. His findings show that real money demand M1 in the Republic of Macedonia was stable in the analyzed period.

There is only one study Ozturk and Acaravci (2008) which examines a portion of the South Eastern European countries although they included only four SEE countries in their study: Bulgaria, Croatia, Macedonia and Romania). They estimate the demand for M2 for a panel of 10 transition countries (Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Poland, Romania, Russian Federation, Slovak Republic and Ukraine) using data from 1994-2005 with feasible generalized least squares. The results show that the demand for money and quasi money (M2) is positively related to real GDP and negatively to inflation rate and the real effective exchange rate. The estimated common long-run income elasticity for the ten transition economies is about unity.

III. Data and Methodology

III. 1 Model Specification and Data

Following earlier works on the money demand function (Arango and Nadiri 1981; Stock and Watson 1993; Ericsson 1998; Mark and Sul, 2003; Valadkhani and Alauddin 2003) the empirical model of the money demand can be summarized by the following function.

$$\frac{M}{P} = F(Y, OC) \tag{1}$$

where: M denotes nominal money, P price level, Y a scale variable representing the transaction volume in the economy and OC denotes opportunity costs of holding money.

Before going to identify potential determinants of money demand it is necessary to identify the dependent variable. In the literature (Payne, 2003; Skrabic and Tomic-Plazibat, 2009) the narrower concept of money supply should be used for economies with a relatively underdeveloped financial system. Bearing in mind the current development of the banking and financial systems in the SEE's countries, as a measure for money in this paper we use M1 monetary aggregate, which covers currency in circulation and sight deposits. We then deflate M1 with consumer price index (CPI) to get the measure of the real money balance of M1. The use of a narrow monetary aggregate has several other advantages. First, M1 is a good measure of liquidity in the economy since it consists mainly of financial assets held for transaction purposes. Second, the central bank is able to control this aggregate more accurately than broader aggregates such as M2 and M3 Dobnik (2011). Third, M1 definitions tend to be relatively consistent across countries and, therefore, allow straight comparisons Bruggeman (2000).

Some authors indicate that using GDP as the measure of economic activity leads to overestimation of the level of transactions in the economy and suggest alternative measures such as the level of consumption Mankiw and Summers (1986) or the index of industrial production (Payne, 2003; Skrabic and Tomic-Plazibat, 2009). For the purpose of our study we will follow Payne (2003) and Skrabic and Tomic-Plazibat (2009) and we will use index of industrial production. For this variable we expect a positive correlation with money demand.

According to Payne (2003) exchange rate is an important factor in the demand for money in transition economies. But, the effect of the exchange rate on money demand is not entirely clear. Namely, Komárek and Melecký (2001) indicate that depreciation of the domestic currency is likely to induce extra demand for domestic goods from abroad and the induced rise in domestic production implies higher domestic inflation rate and a need for more money in the economy as the amount of transactions increases. Hence, being the exchange rate denoted as units of domestic currency per unit of the foreign currency, its coefficient should be positive. On the other hand, according to the currency substitution approach Calvo and Rodriguez (1997), depreciation reduces the confidence in the domestic currency, thereby lowering money demand via a substitution effect with foreign money. Hence, its coefficient should be negative. According to the above studies we expect real exchange rate to be ambiguously related to money demand. As a determinant of the exchange rate in this paper we use the nominal exchange rate of domestic currencies per euro.

To measure opportunity cost we use nominal (domestic) short-run interest rate from Central Banks of the selected countries. We choose this variable because according to Ericsson (1998) long-run rates should not be included in the model for money demand when M1 monetary aggregate is used. Also, Komárek and Melecký (2001) suggest that the portfolio

motive of holding such money plays only a minor role relative to the transaction motive. For this variable, we expect a negative correlation with money demand.

The next variable used in our research is the inflation rate. It is used to measure the monetary stability of the country. This variable is expressed by annual increase in CPI (annual percentage base 2005 = 100). The negative impact of inflation has been widely documented in previous research (Hosein 2007; Mehrotra 2008; Dreger and Wolters 2009). Therefore, we also expect a negative relationship with money demand.

Given the variables specified above, we construct a panel data regression model as shown below. The real money demand and exchange rate were transformed into natural logs.

$$L(\mathrm{M1}_i / CPI_i)_t = \sum_{i=1}^{n=7} \alpha_{0i} + \beta_1 (IIPS_i)_t + \beta_2 L(EXRS_i)_t + \beta_3 (NIRATE_i)_t + \beta_4 (INFS_i)_t + \beta_5 (DUM_i)_t + \beta_6 (DUM1_i)_t + \varepsilon_{it} \quad (2)$$

where: i denotes a specific country varying from 1 to 7, t is time starting from January 2005 to December 2014; M1t / CPIt = Real money *(M1* deflated with consumer price index *CPI*); *IIPS* = Index of industrial production (base 2005=100) (seasonally adjusted); *EXRS*= Exchange rate of domestics currencies per euro (seasonally adjusted); *NIRATE*=Nominal interest rate; *INF* = Rate of inflation. (base 2005=100) (seasonally adjusted); *DUM* = effect of the 2008/09 global economic crisis; *DUM1* = effect of the European debt crisis; ε_{it} is a white noise error process;

In order to capture inter-country heterogeneities, one can use the fixed effects model, which allows α_0 to vary across countries by estimating different intercept terms ($\alpha_{01}, \alpha_{02...,} \alpha_{05}$) .

For our research we focus on factors that determine money demand in seven countries from South- Eastern Europe (Albania, Bulgaria, Bosnia and Hercegovina, Croatia, Macedonia, Romania and Serbia). In order to obtain more observations, we used monthly data from January 2005 to December 2014. The choice of the countries and the time period in this paper ware contingent upon the availability of time series data on all the variables included in the model. Some of the above-mentioned determinants, such as: index of industrial production, exchange rate and inflation, are seasonally adjusted using the Tramo-Seats method. Apart from the actual variables in the empirical model we follow Kjosevski (2013) and we include two dummy variables. With DUM we mark the global economic crisis that has value 1 for the period from October 2008 to December 2009 and 0 for all other periods. With DUM1 we mark the European debt crisis that has value 1 for the period from January 2011 to December 2012, and 0 for all other periods.

Data are obtained from various sources. Data of the dependent determinant the M1 is obtained from the websites of the Central Banks for selected countries. Index of industrial production, the consumer price index and inflation are taken from the websites of the State Statistical Offices and the World Bank. Nominal interest rates and the exchange rate of domestic currency per euro are also taken from the websites of the central banks of selected countries.

III. 2 Methodology

In order to analyze the determinants that are affecting the money demand in seven selected SEE countries, we use the panel data analysis. Among the main advantages of panel data, compared to other types of data, is that the approach allows the testing and adjustment of

the assumptions that are implicit in cross-sectional analysis Maddala (2001). A number of econometricians state that the use of panel data analysis can be very beneficial in a number of ways, including: (i) panel data suggest that individual countries etc. are heterogeneous; (ii) panel data give more information, more variability, less colinearity among other variables, more degrees of freedom and more efficiency; (iii) panel data can capture and measure effects that are not detectable in cross-section time-series analysis, as well as provide a platform on which to test more complicated behavioral models Hsiao (1986).

Before proceeding to econometrics techniques, i.e. to choose which method will be used in our study, we need to verify stationarity of selected variables. According to Campbell and Perron (1991) standard unit root tests can have low power against stationary alternatives for the important cases. As an alternative, recently developed panel unit root tests are applied. Therefore, in the paper we have applied, the IPS test Im, Pesaran and Shin (2003) and Fisher-Type test using ADF and PP-test (Maddala and Wu,1999). These procedures allow for deterministic and dynamic effects differing across the panel members.

Maddala and Wu (1999) further disagreed with the average ADF statistics method and instead, they employed a Fisher test to combine the p-values from unit root tests for each cross-section. Their tests have more advantages because: (1) the cross-sectional dimension can be either finite or infinite; (2) each group can have non-stochastic and stochastic components; and (3) the time-series dimension can vary for each cross-section Baltagi (2001). Also, the advantage of the Fisher test is that unlike the IPS test, it does not require a balanced panel, and allows the use of different lag lengths in the individual ADF regression.

In our study we prefer Fisher-type tests but we also report the results of the IPS tests to provide an additional check for robustness.

Table 1

Unit Root Tests

Test Variable	IPS		ADF-Fisher Chi square		PP-Fisher Chi square	
	Level	First Difference	Level	First Difference	Level	First Difference
LM1	-0.65056 (0.2577)	-10.9518 (0.0000)	18.3855 (0.1898)	148.469 (0.0000)	63.1381 (0.0000)	465.887 (0.0000)
IPIS	-0.94063 (0.1734)	-12.1158 (0.0000)	18.7744 (0.1739)	169.440 (0.0000)	38.0038 (0.0005)	566.324 (0.0000)
INFS	-2.59672 (0.0047)		40.9396 (0.0002)		28.2517 (0.0132)	
LEXRS	-7.48097 (0.0000)		135.409 (0.0000)		50.6810 (0.0000)	
NIRATE	-1.29191 (0.0982)		32.3744 (0.0035)		79.1689 (0.0000)	

Source: Authors' calculations.

Table 1 shows the results of the IPS, and ADF Fisher panel unit root tests. While the exchange rate of domestic currencies per euro, rate of inflation and nominal interest rate are stationary in their levels, the results are not consistent for the monetary aggregate M1 and index of industrial production. Namely, the unit root tests show that these variables have unit root at their levels, and become stationary at the first difference.

In view of this problem, we perform panel ARDL model. Pesaran et al. (1999) suggested two estimators for the panel ARDL model: mean group estimator (MGE) and pooled mean group estimator (PMGE). The difference between these two estimators is that the MGE seems to be more consistent under the assumption that both slope and intercepts are allowed to vary across country, while PMGE is consistent under the assumption of a long-run slope homogeneity Ndambendia, Njoupouognigni (2010). According to Pesaran et al., (1999) the basic assumptions of the PMG estimator are 1) the error terms are serially uncorrelated and are distributed independently of the regressors, 2) there is a long-run relationship between the dependent variable and explanatory variables, 3) the long-run parameters are the same across countries. Furthermore, this estimator is particularly useful when the long run is given by conditions expected to be homogeneous across countries while the short-run adjustment depends on country characteristics such as vulnerability to domestic and external shocks, monetary and fiscal adjustment mechanisms, financial-market imperfections, and relative price and wage flexibility Loayza (2004). The PMG estimator is sufficiently flexible to allow for long-run coefficient homogeneity over only a subset of variables and/or countries.

After these explanations, we employ the PMGE estimator in this study. Equation 2 can be rewritten for panel ARDL (pi, qi) form as follows:

$$Y_{it} = \alpha_i + \sum_{j=1}^{pi} \lambda_{ij} Y_{i,t-j} + \sum_{j=1}^{q} \delta_{ij} X_{i,t-j} + \varepsilon_{it} \quad (3)$$

where: Y is a dependent variable (LM1), $X_{i,t-j}$ is the (k x 1) vector of of regressors for group i and α_i represents the country specific-effects (fixed effects).This model can be reparametrized as a VECM system:

$$\Delta Y_{it} = \alpha_i + \theta_i (Y_{i,t-1} - \beta_i X_{i,t-1}) + \sum_{j=1}^{p-1} yij \Delta Y_{i,t-j} + \sum_{j=1}^{q-1} yij \Delta X_{i,t-j} + \varepsilon_{it} \quad (4)$$

where: β_i are the long-run parameters and θ_i are the error correction coefficient measuring the speed of adjustment towards the long-run equilibrium. The PMGE estimator restricts the long-run coefficients to be equal over the cross-section, but allows for the short-run coefficients and error variances to differ across groups on the cross-section; that is $\theta_i = \theta$, for all i.

Next, we examine the structural stability of the error correction model of money demand using cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) of recursive residuals test. These tests are commonly used by authors who explore the demand for money (Bahmani-Oskooee and Shin, 2002). Both the cumulative sum and the cumulative sum of squares statistics lie within 5% of critical values, suggesting the long-run model stability.

IV. Empirical Results

Table 2 presents the results from the Pool Mean Group estimation of ARDL. Maximum lags are based on Akaike information criteria (AIC)

Table 2

Pool Mean Group Estimation of ARDL(1, 1, 1, 1, 1, 1, 1)

Variable	Coefficient	Std. Error	t-Statistic	Probability
Long Run Equation				
IPIS	0.008	0.001	4.991	0.0000
INF	-0.003	0.001	-0.273	0.7804
NIRATE	-2.429	2.385	-0.104	0.9191
LEXRSA	-0.559	0.331	-1.682	0.0921
DUM	-0.156	0.058	-2.667	0.2379
DUM1	0.130	0.049	2.641	0.0084
Short Run Equation				
COINTEQ01	-0.164	0.130	-1.269	0.0263
D(IPIS)	-0.001	0.001	-1.283	0.1989
D(INF)	-0.001	0.002	-0.282	0.7793
D(NIRATE)	0.016	0.014	1.165	0.2435
D(LEXRSA)	-1.523	0.516	-2.952	0.0033
D(DUM)	-0.019	0.013	-1.391	0.1622
D(DUM1)	0.012	0.014	0.919	0.3604
C	1.225	0.911	1.343	0.0790
Country-specific intercept				
Albania	0.020	0.001	12.73	0.0010
Bosnia and Hercegovina	6.658	0.503	13.22	0.0009
Bulgaria	0.283	0.026	10.53	0.0018
Croatia	0.456	0.045	9.965	0.0022
Macedonia	0.113	0.008	13.82	0.0008
Serbia	0.847	0.127	6.672	0.0069
Romania	0.200	0.037	5.381	0.0126

Source: Authors' calculations.

The proposed long-run model suggests that demand for money M1 depends on the income (real industrial output) and foreign exchange rate. Also, in the selected countries the second dummy variables DUM1 which were introduced in the model have statistically significant impact of the demand for money. The coefficient of index of industrial output has a positive sign, meaning that an increase of 1% in the industrial output generates an increase of 0.008% in the demand for real M1. This is an expected result, since based on the underlying theory the income (GDP) elasticity of money demand should be positive. The coefficient on the effective exchange rate is negative and statistical significant. The results are consistent with Kjosevski (2013) and indicate that after depreciation of the exchange rate and if the public expects further depreciation, then the public would demand more foreign currency and less domestic currency, leading to a decrease in M1 money demand. This relationship between money demand and exchange rate is also consistent with the work of Bahmani-Oskooee (1996) which argues that if a depreciation of domestic currency results in an increase in expectations of further depreciation, the public may decide to hold more foreign currency and less domestic money. The significance of this determinant in the model is confirmed by the high degree of euroization in selected countries.

The results of the second dummy variable are in line with the result of Kjosevski (2013). The coefficient is statistically significant and indicates a 0.012 higher demand for real M1 money, solely as a result of the European debt crisis. This result is not surprising, because European debt crisis and lack of confidence in the euro triggered a rebound in demand for domestic currency Kjosevski (2013).

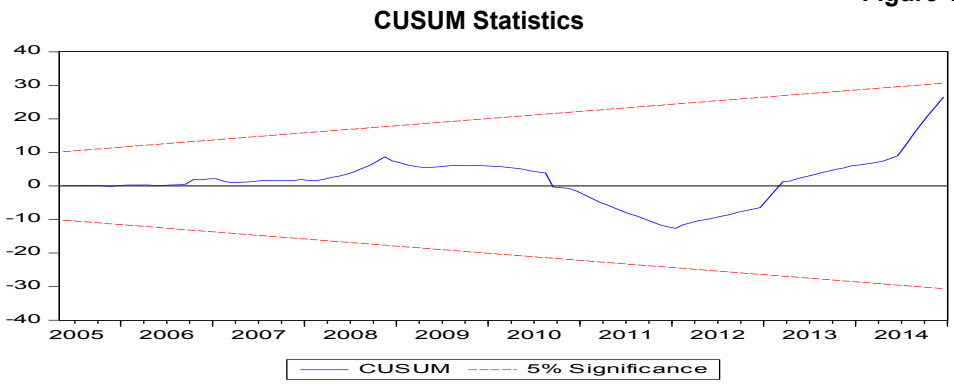
Furthermore, we estimated the short-run model. Almost all estimated coefficients of a short-run dynamic model are small and not significant but display signs as expected from theory. Changes in index of industrial production, the nominal interest rate, rate of inflation and the two dummy variables are insignificant in the short run model. Given this result, the exchange rate is the only variable that holds both in the long and in the short run. The estimated coefficient of the error-correction term is highly significant, validating the significance of the cointegration relationship of the common components in the short-run model for money demand. A negative sign implies that the money demand adjusts in the current month following disequilibrium in the previous month. In other words, if there is an excess of money in the current month, in the next month the agents will reduce their money holdings. In terms of size, the adjusting parameter is small, which means that either the cost of disequilibrium is reduced or the cost of adjustment is high.

A comparison of the three further panel data studies applying an error-correction model by (Valadkhani 2008; Nautz and Rondorf 2010; Dobnik 2011) leads to the following conclusions. First, their estimated short-run dynamics are also smaller than the long-run coefficients. Second, Valadkhani (2008) supports that changes in the exchange rate are insignificant in the short run. Third, the other short-run coefficients estimated in this study are smaller compared to the other three studies, except the impact of changes of lagged real money, which is within the range of both studies. The coefficient of the error-correction model might be bigger in this analysis because it measures the speed of adjustment towards overall equilibrium path. Namely, real money is adjusting faster to an equilibrium relation which reflects long-run money demand of not decomposed variables, which is the case in study of Dobnik (2011), who in addition to the common factors also include the country-specific idiosyncratic components. For example, in the study of Valadkhani (2008) coefficient of the error-correction was -0.26, while in the studies of Nautz and Rondorf (2010) and Dobnik (2011) the coefficients were -0.09 and -0.002, respectively.

Since we are particularly interested in whether the estimations achieved are stable over time and therefore useful for forecasting purposes, we proceed with CUSUM and CUSUMQ tests. The result of the test statistics for evaluating the vector stability is presented in Figure 1 and Figure 2.

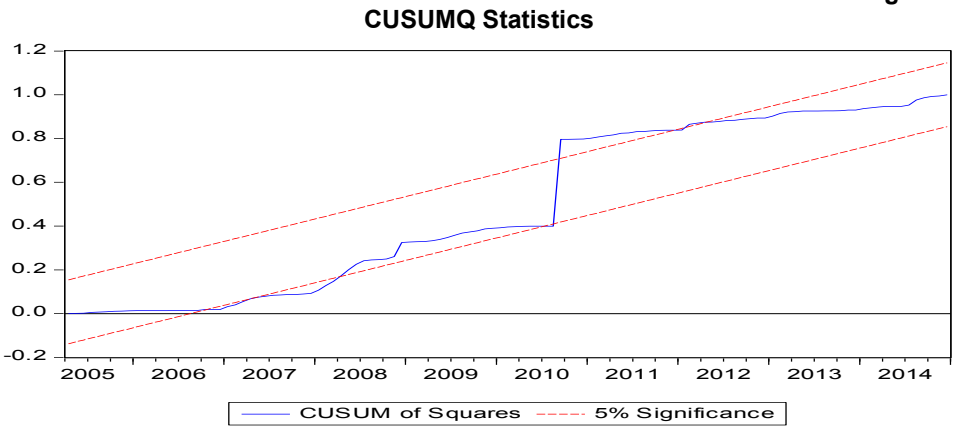
Based on the CUSUM test results, we can say that the demand for M1 monetary aggregate in countries from Southeastern Europe is predictable and can be used for effective implementation of monetary policy. The result of CUSUMQ test shows that M1 demand functions were unstable in 2007 and 2008 and in the end of 2010 till the end of 2012. These results may imply that the global economic crisis and European debt crisis did have a significant impact on the demand for money in the countries from Southeastern Europe. However, this impact on stability was temporary, as stability of M1 demand is not rejected after the end of 2012. Further, M1 stability is not rejected in the whole-sample period. These results confirm that the long-run money demand is stable in the countries from Southeastern Europe.

Figure 1



Source: Authors' calculations.

Figure 2



Source: Authors' calculations.

V. Conclusions

This research study examines factors affecting money demand in seven countries from Southeast Europe (Albania, Bosnia and Hercegovina, Bulgaria Croatia, Macedonia, Romania and Serbia) for the period 2005-2014. To our knowledge, this is the first empirical study to analyze money demand in the selected countries from Southeast Europe. The research results indicate that the main forces affecting money demand are real income, exchange rate of domestic currencies per euro and European debt crisis, which explain the most variations of money demand in the long-run, while real income and interest rate payable on domestic currency up to one month are significant in short-run. Long-run money demand function indicates capacity for relatively quick adjustment and recovery of the equilibrium. Also, based on the presented results, the estimated coefficients in the model are stable. These results show that despite the turbulent times in the region in the past two decades, demand for money was relatively stable in the analyzed period.

The results obtained in this paper can provide useful policy guidelines to the central banks in their quest for price stability. Namely the central banks of selected SEE countries should carefully monitor the exchange rate as most important monetary policy indicator, because this determinant is among the most important drivers of money demand both in the short and long run.

This study does not face significant limitations, but their removal will certainly contribute to broader results. The biggest constraint is the lack of available data on selected determinants for longer periods. The existence of long time series of data would enable obtaining more accurate and more reliable results.

The future research on this issue should include other monetary aggregates such as the M2 and M4, in addition to money supply M1. The further research may also take into consideration other determinants, such as inefficiency of the banking system, interest rates on long-term domestic and foreign currency deposits and interest rates on treasury bills. Econometric techniques that researchers could use in the future regarding this topic, should be either the method of two or three least squares, the generalized method of moments or the dynamic ordinary least squares-DOLS.

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