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FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

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PhD. THESIS

SUMMARY

MONEY DEMAND DETERMINANTS.

EVIDENCE FROM SELECTED CEE COUNTRIES

Supervisor:

PhD. Dr. Habil. Professor Monica Ioana SILAGHI

Ph.D. candidate:

Valentina-Ioana MERA (married CHEREGI)

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INTRODUCTION

"[Economics] is a method rather than a doctrine, an apparatus of the mind, a technique of thinking which helps its possessor to draw correct conclusions."

John Maynard Keynes

The motivation that supports the research on money demand and its determinants comes from a larger topic, which is concerned with the role of financial system and central bank in procuring economic stability. Economists from all over the world recognize the importance that central banks play in influencing the general economic performance through monetary policy. The existence of an optimal robust monetary framework could improve the quality of the decision making process, due to better understanding of the monetary policies and also to the increased ability to adapt to unforeseen conditions (Paniagua, 2016). The challenge that policymakers has to face in order to implement an optimal policy comes from adapting their models to the behaviour of some key macroeconomic variables such as: inflation, output or unemployment. Reliable and accurate information should be at the basis of this process, because of the necessity to understand exactly how some instrument targets affect the macroeconomic aggregates.

In this context, we underline the useful role that money plays for the implementation of the monetary policy. On late years, the global economic and financial crisis brought new challenges for the central banks and monetary authorities in their attempt to enhance the economic stability. Given that monetary conditions changed, new measures have been imposed and, as a result, the central banks adopted unconventional monetary policy measures. Testing the stability of money demand in these times may have strong implication for monetary policy implementation. Fluctuations in monetary aggregates bring information about the evolution of the aggregate demand and, indirectly, about the development of the financial and economic system as a whole.

Nowadays, the use of monetary aggregates as a target for the monetary policy is diminished, in favour of monetary policy regimes based, for example, on inflation targeting or exchange rate targeting. This is also the case in the countries included in our sample. The fact that many central banks have abandoned over the years monetary aggregates targeting is- to a certain degree- the result of the changes that occurred in the function of money demand, much of them causing instabilities or affecting the effectiveness of making accurate projections based on the existing

models. However, the role of the monetary aggregates for the implementation of the monetary policy is not necessarily diminished, as information on money demand is extensively used in macroeconomic models.

The topic of money demand is brought into actuality in Europe these days in the context of euro area enlargement. In order to complete monetary integration, the euro area candidate countries have to fulfil the convergence criteria, among which money play a crucial role. Being aware that monetary integration will mean for the new member states a giving up to their national currency in favour of euro, we consider that understanding what determines the domestic demand for money has, at least, an important informative role for the monetary policy in the pre-accession period. The role of money can not be neglected nor if we relate to the period that follows the accession, when the monetary policy is subordinated to the European Central Bank (ECB). According to its primary objective- price stability- the European Central Bank follows a two-pillar monetary strategy approach, that analyses both economic and monetary developments. The monetary analysis is based on a comprehensive analysis of the monetary aggregates, their components and their counterparts. Therefore, money play a well-defined role for the medium and long-term economic analysis of ECB, in order to assess their impact on the future economic growth path and inflation developments.

The prospect of becoming euro area members has generated some effects on the domestic demand for money in the candidate countries. As they become more integrated, domestic agents' preference for a foreign currency increases, and they choose to substitute the domestic money with the euro. Dollarisation was a widespread phenomenon in the Central and Eastern European (CEE) countries, even before they became members of the European Union. This form of substitution between the domestic currency and the foreign currency was, in part, the consequence of high inflation rates experienced in the first years of transition towards a market-based economy. Some notable differences can be identified among the countries in our sample regarding the proportion of foreign currency denominated loans or liabilities if we refer, for example, to 2016 data. While countries like Romania, Croatia, Bulgaria or Macedonia have high proportion of foreign currency denominated loans or liabilities, in Czech Republic and Poland the situation is reversed. These data are correlated with the attitude identified in the CEE countries concerning euro adoption. According to the Flash Eurobarometer (2017), in Bulgaria,

Hungary, Croatia or Romania the citizens that are pro euro adoption share a higher proportion as compared to those that are against. In Czech Republic and Poland there is a bigger share of citizens against euro adoption. The preferences regarding euro adoption may be correlated to people's trust in the foreign currency and can, in part, explain the relatively low share of foreign currency denominated loans.

The thesis entitled *"Money demand determinants. Evidence from selected CEE countries"* aims at identifying the determinants of money demand in the CEE countries. We follow this approach by starting from the theoretical grounds and then moving to the empirical view, by analysing the particularities that define the demand for money in the Central and Eastern European countries. Moving beyond the reasons that determine the demand for money from the point of view of the individual, we attempt to offer some insights on the determinants of money demand from an aggregate level. Therefore, the present work is addressing the topic of money demand from a macroeconomic perspective. More specifically, the purpose is to identify the macroeconomic factors and conditions that can induce changes in the domestic demand for money.

In our approach, we start from the theoretical assumptions regarding the factors considered as drivers for money demand. These theoretical considerations are used so as to define the benchmark theoretical model used for testing the empirical hypothesis. In the thesis, the demand for money is studied from the empirical point of view, as our main purpose is to identify the particularities of money demand that characterize the countries from our sample. In the first step, in each country the function of money demand is studied separately, so as to identify the country-specific features. Time series modelling techniques are used for this purpose. In the second step, all the countries are studied from a panel perspective, based on the similarities and differences identified on the country-level analysis. Additional determinants, considered as relevant for the sample of CEE countries in the analysed period, are added in the analysis. The purpose is to identify if the domestic demand for money is influenced by the changes occurred in the period that preceded the European union accession or that precedes monetary integration. The panel analysis covers the period 2008-2017, a period in which some of the countries in the panel were already EU members and were on their path towards euro adoption (Bulgaria, the Czech Republic, Hungary, Poland, Romania and Croatia-only from 2013), while others followed their steps towards EU accession (FYR Macedonia and Turkey). More specifically, we attempt

to answer the question whether the prospective of European monetary integration and the changing composition of money demand may have caused some instabilities for domestic money demand.

The main *objective* of the present work is to provide updated evidence on the determinants of money demand in CEE countries, in the context of the transformations brought by the process of European integration. In particular, we attempt to identify the factors that are affecting the demand for domestic currency, besides the traditional determinants considered in the literature. The function of money is expanded so as to capture the specific features that characterize monetary development in this region, in order to bring useful insights on the informational role of money for the design of the monetary policy strategy. The topic gains renewed interest in the context of euro area enlargement, due to the reshaping of the economic environment.

The thesis is structured in four chapters, detailed briefly in the following paragraphs.

The first chapter "*Theoretical models of money demand*" is designed to make a review of the main theoretical models that describe the demand for money and its determinants. Based on the theoretical incursion made in this chapter, we will be able to state the assumptions that are further on used in the empirical part of this work. In our approach, we start from the early theories on money demand, which describe the increase in the quantity of money in relation to the evolution of prices. Classical economists, among which we list Adam Smith, Davis Ricardo or John Stuart Mill, bring their contribution in associating money with the exchange and in defining wealth as the result of the production process. Therefore, for the classical theory money was just a vehicle that facilitates transactions and not a variable that could determine fluctuations in the real economy. Irving Fisher, formalized the quantity theory of money through the well-known equation of exchanges. According to this equation, any change in the quantity of money will determine a proportionate change in prices, because the velocity of money is considered to be constant in time. The Cambridge formulation of the quantity theory of money, restates the previously formulated theory, and moves the attention towards the reasons that influence individual demand for money. Money are no longer seen just as a medium of exchange, but they are included in the category of assets.

A fundamental contribution to the theory of money demand was made by John Maynard Keynes. By focusing on the motivations that determine people to hold money, he distinguishes between the speculative motive of holding money and transactional and precautionary reasons. The speculative demand is elastic to changes in the interest rate, while the level of income determines the transactional and precautionary motive. Milton Friedman is bringing other valuable insights on the function of money demand and shapes the monetarist view on money demand. He considers that the demand for money is influenced by the reasons that determine the holding of any asset-money being an asset- and expands the range of assets that may be part of an individual's portfolio. The debate on the reasons that influence individual's money demand or the demand for money at the aggregate level remains an open one. Nevertheless, it is largely accepted (Hardwick, Khan and Langmead (1994), Keynes (1973), Friedman (1987)) that the demand for money is positively determined by the level of income and negatively affected by the opportunity cost of holding money.

Chapter two, entitled *"The specification of money demand function",* makes the transition from theory to empirics. In this section, starting from the theoretical considerations developed in the first chapter, we are trying to define the main elements that describe the empirical function of money demand. In the first part, we rely on the reasons that caused over time changes regarding the role of money demand in the formulation of the monetary policy. Based on the estimates on different forms of the function, the empirical models rely on different indicators to explain the evolution of money demand. Therefore, in what follows, a short review of the money demand empirical literature is presented, for both developed and developing countries, so as to capture the factors that can bring them closer or can differentiate them in terms of the monetary analysis. The review is made also from the perspective of different variables considered as the determinants of money demand in empirical studies (for example: Dreger, Reimers and Roffia (2007), Arnold and Roelands (2010), Kumar (2011), Foresti and Napolitano (2013)), namely: the income, the interest rate, the inflation rate and the exchange rate. The last part of the chapter is supposed to bring us closer to the empirical part of the thesis, by moving our attention on the main characteristics that define the monetary aspects of the countries belonging to the Central and Eastern Europe. Reference is made here to the institutional and structural transformations experienced during transition; the monetary policy regime adopted by these countries; inflation and prices; dollarization or monetization.

In the third chapter, "*Money demand determinants in CEE countries. Updated evidence*" we conduct a country-level empirical analysis on the stability of the demand for money. Our sample consists of the six Central and Eastern European countries that belong to the European Union: Bulgaria, Croatia, Czech Republic, Hungary, Poland and Romania. The purpose is to identify the features that describe the function of money demand, to see how the traditional determinants of money demand can describe current economic developments and to identify possible sources that bring them closer in terms of the factors that affect domestic currency demand. The estimations are conducted using the Auto-Regressive Distributed Lag (ARDL) methodology proposed by Pesaran, Shin and Smith (2001), which allows accounting for both short-run and long-run effects on money demand. In the specification of money demand we include a scale variable-the real gross domestic product- and variables that capture the opportunity cost: the inflation rate, the interest rate and the exchange rate. We also control for the effect of the crisis and for the changes in the monetary policy strategy occurred during the analyzed period. This section aims at finding the similarities among these countries, based on the empirical estimates, in order to draw country-specific conclusions on the stability of money demand.

The last chapter, "*Money demand stability and the role of economic sentiments in the CEE countries*" is dedicated to the study of money demand from a cross-country comparison perspective. Trying to identify the specific determinants related to the ongoing process of monetary integration and European integration, we add to our sample two EU official candidate countries: Turkey and the former Yugoslav Republic (FYR) of Macedonia (the sample is restricted by data availability). Starting from the sources of instability detected in the results offered by the previous chapter, here we extend the traditional formulation of the money demand function. The starting hypothesis is that the ongoing process of economic and monetary integration may constitute for the CEE countries a source of perceived instability or uncertainty. We rely on the changing perception regarding euro area membership and on the visible differences existent among the countries in our sample regarding the attitude against euro adoption. The extended version of money demand function includes a measure of economic sentiments-the European Sentiment Indicator. The panel data analysis is conducted over 2008-2017, on quarterly data, by employing panel cointegration techniques. The long-run money demand function is estimated based on the Dynamic Ordinary Least Squares (DOLS) methodology proposed by Kao and Chiang (2000). In more details, the purpose of this chapter is

to see if the attitude regarding the adoption of the euro or the changing composition of money demand has influenced the stability of money demand in the CEE countries.

This work contributes to the empirical literature on the determinants of money demand in several ways:

- Firstly, it provides updated evidence on the determinants of money demand in the Central and Eastern European countries using both the country-level analysis and the panel analysis. This approach is followed in order to identify if there are some notable differences regarding the stability of the money demand function between the countries. Based on the differences identified, in a second step we perform a regional analysis in order to see if the role of economic sentiments in this region (sentiments related to economic developments and European and monetary integration) have impacted on the stability of domestic currency demand.
- Secondly, we included in our sample two category of countries: European Union member countries and EU official candidate countries. The first category comprises countries that are following steps toward fulfilling the convergence criteria required for euro area accession, while the countries belonging to the second category are on their path towards European integration.
- The traditional specification of the money demand function is extended in our work in order to include the specific characteristics of the CEE countries. More specifically, we account for the perceived uncertainty in this region, by including the European Sentiment Indicator in the empirical function of money demand.
- The observed period allows us to extract from the data the effects of the increased uncertainty associated to the global economic and financial crisis, that could have influenced money demand. The crisis form 2008-2010 caused liquidity problems for money holders and induced episodes of increased uncertainty.

All of the above mentioned steps are expected to offer an updated evidence on the stability of money demand in the Central and Eastern European countries in the years that precede European or monetary integration. We expect to identify country-specific or region-specific features that can describe monetary developments. The results should offer some insights on the reliability of money demand for the monetary policy, based on the level of predictability we can detect from

the data. Some policy implications are going to be offered in the final conclusion section, in order to state how our work effectively contributes to the existent literature on money demand.

SUMMARY CHAPTER 1

Theoretical Models of Money Demand

Theoretical considerations about money demand stood at the basis of the economic thought from hundreds of years. Economists and policymakers were concerned to examine the outcomes that a change in the quantity of money may determine in the real economy. They were keen on determining the channels of transmission of different measures taken in specific economic conditions. The study of changes in the stock of money is motivated by the fact that these changes may affect the purchasing power of money holders and therefore their consumption and wealth. From the aggregate point of view, these changes affect price levels, resulting in inflation pressures which may determine an increase in macroeconomic instability.

The question that triggered most of the theoretical and empirical studies on money demand (as, for example, Friedman (1987), Mauleon and Sarda (1999), Bischoff and Belay (2001), Durani and Qureshi (2016)) is concerned with the role of money in the aggregate level. More specifically, they tried to determine whether money can make any substantial improvement in macroeconomic modelling. Goldfeld (1982) tried to assign a role for money, stating that they are just an asset among a large number of other assets. The demand for money as an asset will be "the function showing the amount of money people want to hold as an asset, as determined by a specified list of economic variables such as their incomes and the cost of holding money" (Henderson & Poole, 1991, p. 388). The decision on the amount of money that should be held as currency has at its basis the possible gains and losses. As currency is the most liquid asset, individuals choose to hold their wealth in this form in order to finance current and expected expenditures. However, they will not increase this amount infinitely, as currency pays no interest.

The demand for money is therefore influenced by the same reasons that influence the demand for any other asset (Mishkin, 2012, pp. 262-263), namely: the wealth of the individual, the expected return relative to other assets, the associated risk and the liquidity. The demand for money is positively linked with an increase in wealth and an increase in the expected return on money

relative to other assets. The risk associated with holding money will negatively influence the demand for money, as people try to avoid possible loses resulted from the appearance of an unexpected risk. In time, as new financial assets with a high degree of liquidity were developed, the demand for money dropped. Therefore, the increased liquidity of other assets negatively influences the demand for money, as it creates new alternatives for storing their wealth.

In this context, the role of the interest rates can be integrated in explaining the demand for money. The relation established by Keynes (1973, pp. 265–266) is an inverse one, as the greater is the interest rate, the smaller will be the demand for money. The rationing is based on the fact that, by holding money, an individual sacrifices the interest rate that could have been earned by holding interest-paying assets. The risk associated with the decision of holding money is represented by inflation, which reduces the real value of money.

Starting with the early theories developed by the classical economists Adam Smith, Jean Baptiste Say, David Ricardo, John Stuart Mill, among others, money was seen mostly as a commodity. Their views form the central point of the classical approach, which redefines money in the economy either by the quantity of labour necessary so as to produce currency (Tutin, 2014, pp. 204-205) or by the utility they bring in facilitating transactions (Say, 1880). Later on, it was put the basis of the quantity theory of money, formalized by Irving Fisher in the equation of exchanges (Fisher and Brown, 1912, p.48). According to the quantity equation, any change in the quantity of money will determine a proportionate change in prices. An important contribution in the field of money demand had Baumol (1952) and Tobin (1956) that analyzed the transaction demand for cash. They developed a theoretical model in which transaction balances, or the transactions demand for cash, are negatively related to the interest rate. The main implication of the model formalised by Baumol (1952) is that the volume of the demand for cash rises in a lower proportion than the volume of transactions. Taking further his idea, Tobin (1956) showed in his model that the demand for cash varies inversely with the rate of interest, while there is a direct relation between the evolution of the demand for bonds and the interest rate.

Keynes (1970, pp.212-216) formulated a model of money demand that explains which are the factors that influence the preference for liquidity. His main contribution to the theory of money demand comes from the fact that he was interested in determining which are the reasons that determine people to hold money and, therefore, he distinguishes the speculative motive of

holding money by the transactional and precautionary motives. The monetarists, whose main representative economist was Milton Friedman, stated the "modern" quantity theory of money. In their perspective, if the function of money demand is stable, there can be quantified the impact of changes in the stock of money on consumption and income. Friedman's main contribution is that he enlarges the range of assets that can be hold in an individual's portfolio (Friedman, 1987, p.12). As compared to the Keynesian theory, he also considers money as a function of a scale variable, of the return on other assets and of the associated risk. But, in addition, he also considers factors such as: the division of wealth between human and non-human forms; the expected rates of return on different assets; variables that may influence the utility of money in terms of other assets, like: the degree of economic stability (negatively related to money demand), the rate of inflation (negatively related to money demand), the volume of trading of existing capital goods (Friedman, 1987, pp. 11-12). The debate between Keynesians and monetarists remains an open debate, in the attempt to explain which are the channels through which money can influence the aggregate demand. The central point of this debate is the different perspective that the advocates of the two theories have on the role of money. While the Keynesians consider money an asset like any other, the monetarists consider that money have specific functions and properties, that differentiate them from all other assets. The implications that result from these views are that: the Keynesians consider money unstable and support the role of the fiscal policy in effectively influencing aggregate demand and the monetarists are advocates of the monetary policy effectiveness in determining aggregate demand, as they consider the money demand function as stable.

If we take a look at the importance given to money from the temporal point of view, we can see a shift from an approach in which money don't affect the business cycle to an approach in which money is all that counts. The supporters of the latter view, among which Friedman (1984), emphasize the existence of an irregular relationship between money and the business activity. In the classical theories the role of money was relegated, as it was considered that money can not affect the real variables in the economy. The advocates of the Keynesian theory argued that the interest rate channel facilitates the transmission of the effects of changes in money supply on the output. By comparison, the monetarist view distinguishes between long and short term. They state that money can affect the real variables in the economy, but only in the short-run, and in the

long-run they can affect only nominal variables. In other words, it is underlined money neutrality in the long-run.

Given that the central element that stays at the basis of this research is the demand for money, we focus our attention primarily on understanding the factors that affect the demand for money, starting from the individual level up to the aggregate demand. As the first chapter demonstrates, money have been regarded by the economists from multiple angles as they were advocates of one or another theory. However, despite all the characteristics that separate these views, at some points all these theories seem to converge (Keynes, 1973; Friedman, 1987). Reference is made here to the fact that the demand for money is in all the models seen as inversely related to the opportunity costs of holding money and positively related to the level of income.

SUMMARY CHAPTER 2

The Specification of Money Demand Function

The topic of money demand has been extensively approached by economists all over the world, starting especially with the second half of the twenty century, and it remains even in the present times a topical issue. As we have detailed in the first chapter, numerous theoretical models were developed over time in order to explain the role of money in the global economic environment, as well as the mechanism of propagation of the fluctuations of money demand in the real economy. In addition, multiple studies approached this topic empirically trying to prove the impact of money in attaining macroeconomic stability. These studies based their effort on real data macroeconomic series, different sample of countries and different methodological approaches.

Moving from the theoretical framework to the empirical one, some aspects worth to be mentioned. As resulted from the theoretical models on money demand, the approach is different from the point of view of model specification. We make reference here to the fact that different determinants of money demand are considered, depending on the underlying theoretical assumptions.

The assessment regarding the role of money demand, as a reliable instrument for the monetary policy, changed in time. This change in perception regarding the importance of money was due

to the empirically tested instability of money demand. In the '90s, Bernanke and Blinder (apud Goux, 2011) state the existence of this issue. According to their view, the instability may be „[…] a product of deregulation and innovation by financial intermediaries" (McCallum and Goodfriend, 1987). The instability of money demand appeared at different points in time if we compare, for example, the United States and the euro area. Despite of these temporal changes in perception, there is widely accepted that the investigation of money demand dynamics is extremely relevant for central bank policies and, more precisely, for monetary policy implementation. It is at the cornerstone that the existence of a stable long-term relationship between money demand and its determinants is the prerequisite for conducting a monetary policy based on monetary aggregates targeting.

Having in mind our objective of testing the stability of money demand in a sample of emerging economies, in the second chapter we try to create a link between the theoretical models and the empirical ones. We do so by first trying to explain what determined shifts in the interest regarding the study of money demand over time. The concepts of money demand and money supply are explained in order to have a clue on different measures of money used nowadays and to understand their use in the conduct of monetary policy. Starting from the four functions that money perform, stated by W. Stanley Jevons (1875, pp. 13–18): medium of exchange, measure of value, standard of value and store of value, we make in this section an attempt to find the main reasons that determine people to hold money.

Then we make a review of the literature by taking into consideration the determinants used in the empirical form of the money demand function, for both developed and emerging economies. This is useful for delimitating the contribution of our empirical work that is the subject of the last two chapters. The study of money demand in developed countries is focused mainly on USA, euro area or OECD countries, the authors' approach being eased by the long series of available data (see, for instance, Mauleon and Sarda, (1999); Guerron-Quintana, (2009); Jawadi and Sousa, (2013); Foresti and Napolitano, (2013); Sousa, (2014); Rezai, (2014); Foresti and Napolitano, (2014)). In the case of the transition or emerging economies, there are less empirical studies and they cover, in general, a shorter time span. Some examples of authors that employed samples of data covering less developed economies or transition economies from Europe are: Fidrmuc, (2009), Bahmani and Kutan, (2010), Bahmani-Oskooee, Kutan and Xi,(2013). They

all invoked data availability as one of the main reason for selecting the countries in their sample. The conclusion that arises from all these studies is that, in its traditional formulation, money demand is defined as a function of a scale variable (i.e. the nominal GDP, a wealth indicator) and of the opportunity cost of holding money (i.e. the interest rate, the exchange rate, the inflation rate). Money demand is positively influenced by the level of income and negatively by the opportunity cost of holding money, as Keynes (1970) stated when he introduced the speculative demand for money.

In the last part of the chapter, some relevant stylised facts of the Central and Eastern European countries are presented in order to create the context for the empirical work that is the subject of Chapter 3 and Chapter 4. For this purpose, we take into consideration previous empirical estimates alongside with real data and we try to identify which variables can be included in the model of money demand for our sample of countries. For filling the gap in the literature, we will focus our attention on transition economies from Central and Eastern Europe. More precisely, the data sample consists of six Central and Easter European countries (*Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania*), based on data availability. The choice of this particular sample of countries is dictated by their current path towards monetary integration. The time span of our study is from 1996 up to 2017, so it is important to establish prior which are the main characteristics of the analysed economies. We therefore present information on inflation and prices, on dollarization and monetization, as well as country summaries on these countries' monetary policy framework.

The stylised facts presented show us that, in spite of all the similarities between the countries we consider in our sample, the sample of countries may not represent a fully homogenous group, because there are differences regarding the degree of monetization and the development of the banking sector.

SUMMARY CHAPTER 3

Money Demand Determinants in CEE countries. Updated Evidence

The demand for money has become an up to date topic in the countries from Central and Eastern Europe that are members of the European Union, as they are expected to join the euro area in the

near future. In this context, assessing the stability of the money demand function can bring additional information for the implementation of the monetary policy decisions.

The aim of this section is to distinguish between those factors that are common among the CEE countries and those factors that reveal country specific characteristics. The results should confirm if there is some sort of convergence between money demand function in these countries in the context of their common goal of euro area accession, or if they keep their national particularities. In this context, we can also identify if there is an effect of substitution between the domestic currency and the foreign currencies. If a strong currency substitution effect is identified, this could be a sign of progress in the process of European integration.

Accordingly, this chapter[1] models empirically the relation between the demand for money and a set of determinants, using the ARDL Bounds Testing Approach proposed by Pesaran, Shin and Smith (2001). We choose to test this relationship in a country-specific framework, on a sample of six Central and Eastern European-CEE- countries. Namely, we include the countries that are European Union members and have not yet accomplished the criteria to join the eurozone. The countries are: Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania. The empirical tests on money demand are conducted considering a time span that covers the period 1996-2016.

We begin the third chapter by trying to restate the relevance of money demand for the CEE countries, in the context of European integration. Therefore, a short description of the common characteristics for our countries is presented, so as to create the context of the study and to assess its importance. The second section makes a short review of money demand literature in CEE countries, with special focus on the countries included in this chapter. These attempts are meant to identify the shortcomings existent in the literature on money demand in this region. Three main sub-areas of research were identified: the study of the stability of money demand function (see for example Dreger, Reimers, and Roffia (2007), Bahmani and Kutan (2010)), the study of the relationship between the domestic currency and a foreign currency (Buch, (2001), (Dumitru, 2002), Selçuk (2003), Komarek and Melecky, (2003), Dreger, Reimers, and Roffia (2007)) and

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[1] Parts of this chapter were published in the article "**Mera, Valentina-Ioana**; Pop Silaghi, Monica Ioana, (2018): *Determinants of the Demand for Money in CEE Countries: Updated Evidence*, Eastern European Economics, 00: 1-24". In the published paper the results differ slightly, as a different interest rate was used in the estimations.

the study on the effectiveness of different monetary policy regimes during transition (Fidrmuc (2009), Slavova (2003)).

The third section describes the empirical function of money demand, the model, the variables used in the analysis and the methodology. A country level analysis is conducted using the ARDL bounds testing approach methodology proposed by Pesaran et al. (2001) which allows for simultaneously testing both short-term and long-term coefficients. The graphical representation from Figure 1 reproduces briefly the main steps conducted in the estimations. Quarterly data are used for the following Central and Eastern European countries: Bulgaria, Croatia, Czech Republic, Hungary, Poland and Romania. Our sample covers a time span extending from 1996:Q1 to 2016:Q1 for Bulgaria, Croatia, Hungary and Poland; from 2002:Q1 to 2016:Q1 for Czech Republic and from 2001:Q1 to 2016:Q1 for Romania.

Figure 1- The empirical approach
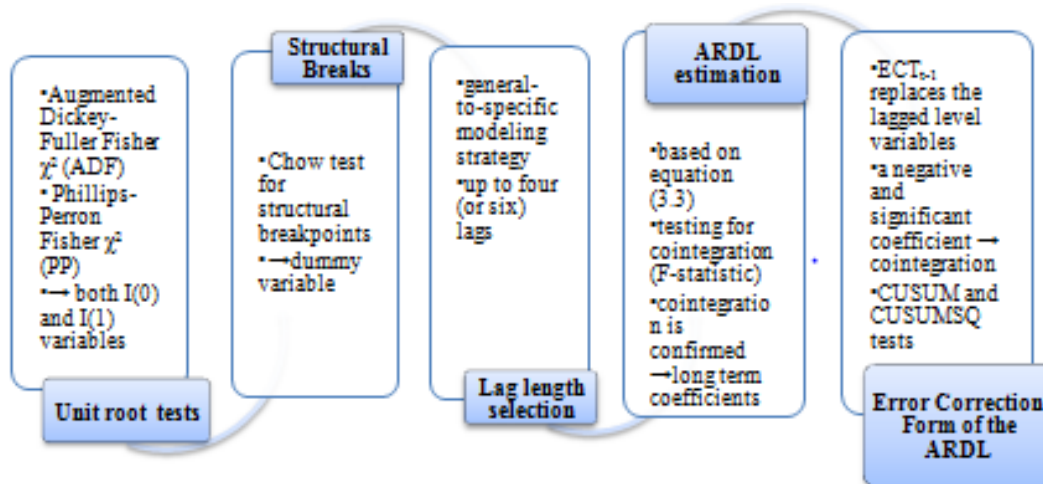
Source: author's representation.

For each country, two models are estimated: the Basic Model and the Extended Model. The Basic model of money demand follows the conventional form developed in the paper of Leventakis (1993):

$$lnM2/P_t = \alpha_0 + \alpha_1 lnY_t + \alpha_2 \pi_t + \alpha_3 R + \varepsilon_t \qquad (3.1)$$

where: M2/P is a measure of a broad monetary aggregate (the real M2), and the real gross domestic product, the inflation rate and the domestic interest rate are represented by Y, π and R, respectively. The coefficients α_i represent the elasticities of money demand with respect to the

income (α_1), inflation rate (α_2) and the interest rate semi-elasticity (α_3), while α_0 is a constant. In the Extended Model we additionally consider the exchange rate in order to quantify the impact of the expectations about exchange rate evolution on the domestic demand for money.

The results provided by the empirical estimations confirm the existence of a long-term cointegration relationship between money demand and its determinants, except for Croatia and Bulgaria. The estimates for the long-term coefficients of money demand have some particularities regarding their magnitude, due to country-specific characteristics. However, some general assessment can be made. The transaction demand for money is significant in all countries, in most of the cases the income elasticity being close to or exceeding unity. This means that the demand for money increases more than proportionally when the income increases.

Furthermore, it is found that the impact of the inflation rate is negative and significant in the long run in Czech Republic, Hungary and Poland. Contrary to our expectation, the currency substitution effect proved significant only in the case of Hungary, Croatia and Bulgaria, while in the Czech Republic the wealth effect dominates the currency substitution effect. Our expectations were based on the fact that, as countries have stepped up their efforts towards European integration, the movements in exchange rate markets should have impacted more and more the domestic money demand. In the case of Poland and Romania this hypothesis is not validated by the estimations, despite of the fact that the in the composition of their currency demand the foreign currencies share a high proportion. The stability of the coefficients is also sustained by CUSUM and CUSUMSQ tests in the case of Czech Republic, Poland, Romania, and partially in Hungary and Croatia. During the crisis, the demand for precautionary balances increased, inducing a positive impact on money demand. To sum up, the empirical results reveal that, except from Bulgaria and Croatia, the function of money demand is stable and information on monetary aggregates can provide reliable information for monetary policy implementation.

Therefore, from the perspective of the policy-makers, the evidence provided in this chapter offers support for money as a relevant indicator for monetary policy (except from the two countries in which the function resulted unstable). By influencing the demand for real money, central banks should be able to stabilize the price level, by keeping a balanced nominal money growth. In addition, a stable money demand function ensures that changes in money supply will not have surprising impacts on other macroeconomic variables.

SUMMARY CHAPTER 4

Money Demand Stability and the Role of Economic Sentiments in CEE countries

In the previous chapter we identified sources of instability in the money demand functions for some of the countries included in our sample. In the light of the results presented on the country-level analysis, in the fourth chapter we try to offer an insight regarding the source of the instability. The detected instability may have, for example, causes that are related to model misspecification. Therefore, we attempt to include additional variables in the specification of money demand in order to account for real economic events that may have destabilised the money demand function.

We hypothesize that economic developments which took place in Central and Eastern Europe over the last twenty five years, may have generated these differences in results. In the context of European enlargement the forces that can determine fluctuations on the domestic money demand have changed. Additional sources of fluctuations and instability can be driven by external economic decisions and policies, which may have influenced domestic demand. The countries from CEE became over the years more and more connected with the euro area or European Union. Some notable examples of the channels that connect these countries are: the trade channel, the financial links or the presence of foreign-owned banks in the CEE countries.

In preparation for becoming members of the European Union, all the countries experienced a sustained process of transformation, based on the restructuration of the economic system from both operational and institutional views. More recently, the six CEE countries we have analyzed in *Chapter 3*- after they became EU members- committed themselves to complete monetary integration by adopting the single currency, as soon as they will fulfil the required criteria. All these changes can be perceived as being sources of economic uncertainty if we relate to people's perception. Therefore, in this section, we attempt to redefine the empirical function of money demand for the CEE countries, by taking into consideration these characteristics.

The question underlying the empirical approach in this chapter is if the demand for money in the CEE countries is still determined by its traditional determinants or the stability of the money demand function is influenced by the perspective of adopting euro. The objective is to find a well

specified money demand function, taking into account the heterogeneities existent between the CEE countries in the context of European integration.

The traditional specification of money demand was extended so as to account for the role of the European Sentiment Indicator. This indicator reflects the overall economic activity, being calculated as a composite indicator which summarizes the developments in five surveyed sectors, namely: industry, services, retail trade, construction and consumers.

The sample of countries comprises two categories of countries:

- European Union members: *Bulgaria, Croatia, the Czech Republic, Hungary, Poland* and *Romania*
- European Union-candidate countries: *FYR Montenegro* and *Turkey*. The other three official EU candidates (Albania, Macedonia, Serbia) were not included in the sample due to data availability for the European Sentiment Indicator.

As compared to the previous chapter, the sample was extended by including EU candidate countries. We intend to report not only to the perspective of monetary integration, but also on the perspective of European integration. Because we added in our sample countries that are not EU members, we can assess the characteristics of the demand for money in the period that precedes European integration, in addition to the sample of six CEE countries that already became EU members. A panel data analysis is conducted over the time span 2008-2017, on a quarterly basis.

In the introduction there is described the context in which the analysis of money demand stability in CEE countries is relevant in the context of economic and monetary integration. Testing the stability of money demand gains renewed interest for CEE countries as it has an important role for the medium-term objective of price stability in the euro area. The focus is, therefore, on the factors that are related to the context of euro integration that may have influenced the demand for money.

As the motivation of our empirical approach in this chapter is related to the perceived uncertainty associated with euro adoption or European accession, we attempt further on to give some examples regarding the attitude in favour or against euro adoption, using recent data provided by the Flash Eurobarometer. The opinion about euro adoption is divided in two categories. The first category comprises those who are in favour of euro adoption, while the second one gathers those

that are against. In Bulgaria, Romania, Hungary and Croatia, the citizens that are pro-euro adoption share a higher proportion as compared to those that are against. In contrast, in the Czech Republic and Poland the situation is reversed. To give a clue on the numbers, in Romania 64% of the respondents are in favour of introducing euro, while in the Czech Republic only 29% think the same. In spite of their preferences regarding euro adoption, when they are asked if they consider that their country is prepared to join the euro area, in all these countries only one in five respondents consider that their country is prepared (Flash Eurobarometer, 2017, p. p.22). Another concept that relates the demand for domestic money with the euro in the CEE countries is the widespread phenomenon of euroisation. In our view, the more likely is their country to adopt the euro, the more willing they are to use the euro in transactions or as a store of their wealth. As a result, this can lead to a switch in their portfolio from domestic to the foreign currency. In the European Central Bank report from April 2017, regarding the role of the euro in the international markets, it is brought into attention the unofficial euroisation that is characteristic to some of the EU official and potential candidate countries from the Western Balkans. Responsible for this are a set of factors, among which are enumerated the confidence in the domestic currency, the intensity of the trade relations with the euro area and also the remittances (ECB Report 2017, pp.5-6).

The model of money demand estimated in this chapter contributes to the previous empirical money demand literature by assessing the role of sentiments on the domestic demand for money, in addition to the traditional determinants. Following the previous empirical studies on money demand, we started from the traditional formulation of the money demand function that includes a scale variable and opportunity cost variables.

Trying to capture the particularities of our sample in terms of monetary developments in the period under analysis, the specification of money demand function was extended by including the European Sentiment Indicator. This indicator is meant to capture the effects of investors' perceptions from five sectors on the overall stance of the economy. In the specification of money demand function this indicator is a measure of the perceived uncertainty. Given that the CEE countries are on their way towards European integration (FYR Macedonia and Turkey) or towards monetary integration (Bulgaria, Croatia, the Czech Republic, Hungary, Poland and

Romania) we hypothesized that the degree of perceived uncertainty coming from the European Union or Euro Area may significantly affect the demand for domestic money.

The results from the panel Dynamic Ordinary Least Squares (DOLS) estimator (Kao and Chiang, 2000) on the money demand function offered some reassuring results regarding the stability of money demand, when the degree of perceived uncertainty was considered empirically. Cointegration between real money and its determinants is confirmed regardless the proxy used for the exchange rate. For exemplification, we report in Table 1 the results of panel DOLS estimator for the long run money demand function, from two benchmark models: *Model 1*, in which is included the exchange rate against euro, and *Model 2*, that uses as a proxy the exchange rate against USD.

Table 1- Panel money demand estimations DOLS-main results

Panel money demand estimations DOLS– Benchmark models		
Dependent variable M2	*Model 1*	*Model 2*
Y	1.019***	1.007***
	(0.000)	(0.000)
R	-0.001***	-0.001***
	(0.000)	(0.000)
Π	-0.018***	-0.034***
	(0.000)	(0.000)
EX_EUR	-0.242***	
	(0.000)	
EX_USD		-0.202***
		(0.000)
ESI	-0.402***	-0.311***
	(0.000)	(0.000)
T	37	37
N	264	264

Notes: 1) ***, ** and * denotes significance at 1%, 5% and 10%. 2) Two lags and one lead were included in DOLS first differences. 3) All variables, except for the interest rate, are in logs. 4) The panel includes: Bulgaria, Croatia, The Czech Republic, Hungary, FYR Macedonia, Poland, Romania and Turkey. Sample period: 2008Q1-2017Q1.

Additionally, we checked the robustness of the benchmark models, by: i) replacing the bilateral exchange rates with the nominal effective exchange rate and the real effective exchange rate; ii) assessing the impact of the global financial crisis that hit the economy during 2008-2010; iii) using another methodological approach, the Fully-Modified Ordinary Least Squares (FMOLS) estimator proposed by Phillips and Moon (1999) and Pedroni (2000).

The main results can be summarized as follows. The traditional determinants of the demand for money (real GDP, interest rate, inflation rate) are significant and have the expected sign. The

income elasticity was around unity and significant in all cases. The interest rate had small, but negative effects on the demand for money, the same effect being observable also in the case of inflation rate. This outcome was expected, as the two variables capture the opportunity cost of holding money. The currency substitution effect between the national currencies and foreign currency was confirmed for both bilateral exchange rates - against euro (*Model 1*) or USD (*Model 2*) - with a smaller coefficient for the latter. As six out of eight countries in our sample belong to the UE during in the years covered by the analysis, we find a significant currency substitution effect in favour of the euro.

The role of economic sentiments proves to be significant for the domestic demand for money. The lower is the value of the ESI indicator, the greater is the perceived uncertainty. This leads to an increase on money demand due to precautionary reasons. The robustness check provided in the robustness check section, confirms the validity of the model with respect to the sign and the significance of the ESI. The results remain in line with the benchmark models, regardless of the use of different exchange rate proxies. The only coefficient that changes its significance is the real effective exchange rate, which – in contrast to the benchmark models – suggests the presence of the wealth effect. Even when we control for the effects of the global economic and financial crisis from 2008-2010 the estimates provide nearly the same results. Moreover, a negative impact of the crisis was identified when the bilateral exchange rate was included in the estimations, this indicating that money holders redirect their holdings into less volatile assets, given the increased uncertainty.

The results provided in this chapter demonstrate that the extended money demand function- in which the role of economic sentiments is considered- provides a relatively good explanation for the behaviour of money demand in CEE countries. We conclude that the stability of the demand for money is indeed influenced by the changes occurred in the process of integration. Taking into consideration consumer and investors assessment regarding the overall economic activity inside European Union, helps us identify a stable money demand function for this sample of countries.

CONCLUSIONS

The study of money demand determinants in the Central and Eastern European countries regained renewed interest due to the reshaping of European Union economy. In the context of the transformations that these countries experienced during European integration, domestic money demand can not be considered anymore as only internally determined. As the integration process becomes more and more profound, the demand for money is more likely to be driven by factors coming from European Union or euro area.

The role of money is acknowledged nowadays by the large number of theoretical and empirical models (see, for instance: Schabert (2009), Heer, Maußner and McNelis (2011), Lioui and Poncet (2012), Taylor (2016), Caraiani (2016)) that approach this topic and also by their use in the conduct of monetary policy by central banks all over the world. The underlying requirement for using money as a monetary policy instrument is that a stable relationship can be detected between money and other relevant macroeconomic variables. The stability of money demand function would make money a reliable monetary policy instrument, able to correctly predict the impact that a change in money supply will have on the real economy. Over the years, the prospects over the use of money in macroeconomic models have changed, due to the detected instabilities in the function of money demand, as related to the traditional determinants. Nevertheless, money still remains an important variable in macroeconomic modelling, even though it has more an informative role for the monetary policy implementation process.

Nowadays, not only central banks rely on information on money demand, but also a vast number of studies related to topics like: monetary policy strategies, inflation evolution, exchange rate regimes, the use of unconventional monetary policies, and so on. In this branch of the literature, a segment is occupied by the implicit study of money demand determinants. By looking at the factors that can explain the shifts in money demand in the recent economic developments, authors try to reassess the role of money by expanding the traditional function. Additional variables-capturing country-specific characteristics- are added in the specification of money demand in order to see if the detected instabilities can be modelled and assessed empirically. For this purpose, they rely on information about monetary aggregates with different degrees of liquidity. Based on the underlying assumptions of the model used in the analysis, a narrow or a

broad measure of money is used in the studies (for example: Dreger, Reimers and Roffia (2007), Bahmani-Oskooee, Kutan and Xi (2013), Apergis (2015)).

In relying on the existing literature on money demand determinants we identified and detailed in the present work the main directions on which the literature is focused:

- The demand for money is largely approached in empirical and theoretical studies in developed countries like United States of America, Euro Area or the United Kingdom. Benefitting from large data series the function of money demand was extended in many cases so as to capture the effects of the main international events or the developments of the domestic economic environment. As a result, a large proportion of the studies conducted on money demand have developed around the developed countries.

- With reference to the other group of countries, that includes developing and emerging economies, the literature has made a progress mainly in the last two decades. The empirical literature is relying on developing countries from Europe, Asia, Latin America or Africa, using either the country-level analysis or the panel analysis. Among the reasons that conducted to the scarcity of studies on money demand in these regions (scarcity with respect to the developed countries), the lack of long data series available is the most invoked one. As we are interested mainly in the case of the Central and Eastern European countries, we observed from the existing literature that empirical studies about the countries from this region have became more popular after the waves of EU enlargement.

Moving our attention towards the countries that belong to the Central and Eastern Europe, we identified three main sub-area of research. A first category of studies tries to offer a response regarding the level of stability of money demand, by putting the demand for money in relation to the monetary policy decisions (Dreger, Reimers and Roffia, (2007), Fidrmuc, (2009), Bahmani and Kutan, (2010)). Secondly, there are papers that try to capture the substitution between the domestic currency and a foreign currency or the capital substitution effect, by taking into account the specific characteristics of the countries belonging to this region, during transition (Selçuk (2003), Dreger, Reimers and Roffia (2007), Hsieh and Hsing (2009), Bahmani-Oskooee, Kutan and Xi (2013) among others). Lastly, more recent studies are concerned with the role of money

demand in the context of the unconventional policies adopted after the crisis by the European Central Bank (Gertler and Karadi (2011), Dreger and Wolters (2015b), Neely (2015)).

From the empirical point of view, the methodologies used in studying money demand have to take into consideration some basic requirements. First of all, the specification should include as many explanatory variables as required by the theoretical assumptions, in order to overcome the omitted variable bias. In the same time, taking into account the limited temporal length of the data series, including too many explanatory variable can lead to overparametrization. So, there is a trade-off between overparametrization and omitted variable bias. Secondly, the choice of the methodological approach has to be made so as to overcome both econometrical requirements and theoretical assumptions. One such example in the study of money demand is endogeneity. In order to address and overcome these issues, the estimation methodology should fit the theoretical assumptions of the model and correct these shortcomings.

Based on the analysis of the recent literature on money demand on the CEE countries (studies presented mainly in the second and third chapter), we identified two shortcomings, that constitute our point of departure for this study. To the best of our knowledge, there is no study that aims to identify the characteristics of the money demand function for the CEE countries from both a country and regional perspective in the pre-accession period. We consider this comparison a very useful one as these countries can be considered to be moving together in terms of monetary developments given the process of European integration. However, in order to adapt to their current stance of the economy, each country adopted country-specific measures in terms of monetary policy. This may determine some differences also in the function of money demand. The second issue we consider that can enrich the study of money demand in the CEE countries is the assessment of the factors that influence domestic money demand, factors coming from the European Union or euro area (according to the level of integration). To be more specific, we started from the hypothesis that the perspective of European or monetary integration can induce some specific effects on domestic demand. The first is related with the substitution between the domestic and the foreign currency (the euro), as these countries become more and more integrated to the euro area. The second effect is materialized in the perceived uncertainty associated to the process of integration among the citizens and economic agents. Moreover, our

study benefits from more recent data as compared to the previous studies, which allow us to include and assess the impact of the global economic and financial crisis.

The present thesis was structured in four sections, that followed our approach in deepening the study of money demand, from both a theoretical and an empirical point of view. The first chapter was designed to make a temporal review of the theoretical models developed around the concept of money over the years. Here we focused our efforts mainly on summarizing the assumptions that stood at the basis of every model, in order to be able to choose the working hypothesis used further on in the empirical sections of our thesis. The second chapter made the transition to the empirical section of our work. It relied on the empirical literature on money demand, with special focus on the determinants considered in the literature. From the theoretical models we have reached the conclusion that money demand is positively related to the level of income and negatively related to the opportunity cost of holding money.

Before presenting the results of the current work, we consider important to state the characteristics of the monetary developments identified in the second chapter, because they formed the presumptions of our empirical study. From the analytical point of view, we observed data on different variables that reflect monetary developments in our sample of countries. Some useful conclusions were drawn regarding both common trends and country-specific trends. The study includes six CEE countries that are European Union members and are following their path towards monetary integration: Bulgaria, Croatia, the Czech Republic, Hungary, Poland and Romania. Even though a concrete agenda for euro adoption was not established in these countries, they are expected to join the euro area as soon as the convergence criteria are fulfilled.

- Going back at the beginning of the 1990s, some notable changes were made in order to reconfigure the economic stance in the former post-communist countries. Starting from two digit values for the inflation rate at the end of the twentieth century, countries like Bulgaria, Hungary, Poland or Romania managed to reduce these values well below ten percent, by targeting inflation or the exchange tare. Croatia, in contrast to the above mentioned countries, had a good performance in keeping inflation below 5% for the most of the period. For all these countries, the changes related to the monetary policy strategies on the path towards European integration can be

considered an important contributor for keeping inflation at a low and relatively stable rate.

- A widespread phenomenon that characterizes the CEE countries is euroisation. As a consequence to the distrust citizens have on their domestic currency, they chose to replace the domestic currency with a foreign currency, in order to protect their holdings against depreciation or to keep them safe from the inflationary pressure. In 2016 for example, the share of foreign-currency denominated loans was around 50% in countries like Bulgaria, Croatia or Romania, while in Poland or Czech Republic the share was only around 30%. Given the ongoing process of monetary integration in place in these countries, the trust in the European currency can be perceived as a positive factor for fostering this process. However, we can not neglect the effect that it can have on the stability and controllability of the domestic currency demand.

- In strong relation to the previous described fact is the perception and the attitude of the citizens and economic agents regarding the readiness of their country to join the euro area. Over the last years, the reputational value of the euro area has suffered important changes. Seen mostly as a positive factor before the economic crisis from 2008, euro area membership was not regarded with the same optimism in the aftermath of the crisis. The perception of consumers and investors changed, and the countries adopted different positions regarding euro adoption, according to the Flash Eurobarometer. While in Bulgaria, Romania, Hungary and Croatia, the proportion of those that are pro-euro adoption is higher than the proportion of those that are against, in the Czech Republic and Poland the situation is reversed. Despite their positioning pro or against euro adoption, when citizens are asked if they consider their country prepared to adopt euro, in all the countries only one in five respondents consider that their country is ready to adopt the single currency.

- Euro became a widespread used currency in the European Union members that have not already adopted the single currency due to the channels that connect them to the euro area. The trade channel facilitated the use of euro in transactions, while the financial sector and the presence of the banks originating in the euro area, strengthened the channels of shock transmissions.

- • In order to overcome the economic requirements needed during transition or in the process of integration, the CEE countries adopted monetary policy strategies based either on inflation targeting (Czech Republic, Hungary, Poland and Romania) or on exchange rate targeting (in Bulgaria a currency board arrangement is in place, while Croatia has a managed floating exchange rate regime).

The main results of this thesis are extracted from the empirical analysis conducted in chapters three and four. In what follows, a short presentation of the main results is made for both the country-level analysis and the panel analysis.

The country-level analysis on the determinants of money demand was conducted on a sample of six Central and Eastern European countries (namely: Bulgaria, Croatia, Czech Republic, Hungary, Poland and Romania), covering quarterly data from 1996:Q1 up to 2016:Q1. The results provided by the ARDL Bounds testing approach, gave us information on both short run and long run coefficients of the money demand function. Two models were estimated for each country: a basic model that included as determinants: the real GDP, the interest rate and the inflation rate; and an extended model, that additionally included the exchange rate as a determinant. Some general conclusions can be drawn regarding the determinants. The interest rate semi-elasticity has only a small magnitude in the long-run. The impact of the inflation rate is negative and significant in the long-run in Czech Republic, Hungary and Poland, suggesting that an increase in the price level will redirect people's choice towards holding financial or real assets instead of money. A result that contradicts our expectations is that the currency substitution effect is significant only in the case of Hungary, Croatia and Bulgaria, while in the Czech Republic the wealth effect dominates the first one. In the first three countries, the estimated coefficients are significant and positive and suggest that a depreciation of the domestic currency reduces the demand for domestic currency. In the Czech Republic, the results may be influenced by the fact that the central bank kept the exchange rate of the national currency against euro fixed from 2013 to 2017. In this context, the behaviour of the investors and households did not change in accordance to the exchange rate fluctuations, because they trusted the commitment made by the central bank to keep the exchange rate fixed.

Overall, the results from the country-level analysis revealed the existence of a long-run cointegration relationship between real money and the traditional determinants considered in the

literature, except for Bulgaria and Croatia. In these two countries, the function of money demand is not stable with respect to the determinants traditionally considered in the literature. Therefore, the use of money demand as a tool for the monetary policy may offer impaired signals. In contrast, in the other four CEE countries considered, money demand function may be used as an informative tool for the monetary policy, as it is stable with respect to its determinants. The stability of money demand function makes money a reliable instrument for the monetary authority as it allows them to properly predict the impact of a change in the determinants on the demand for real money.

The panel analysis starts from the results provided in the previous chapter where, at the country level, some notable differences were identified among the six CEE countries. The starting point of this section was the identification of some possible sources that determined the differences in results, in order to see if it is possible to model them empirically. In this sense, we have tied our hypothesis to the common path towards European integration. In order to take account of the heterogeneities of the CEE countries, we extended the traditional specification of money demand by including a variable that captures the perceived uncertainty in the region. The European Sentiment Indicator is a measure of the perceived uncertainty in the sense that it captures the perceptions, actions or sentiments existent in these countries, with respect to the overall economic activity. The ESI includes confidence indicators of economic agents coming from five sectors of the economy: industry, services, consumers, construction and retail trade. Overall, this indicator reflects the assessment of the future course of the economy.

In the empirical analysis on the panel framework we worked on quarterly data from 2008 to 2017, on a sample of eight CEE countries. As compared to the country-level analysis, we added two official EU candidate countries, Turkey and Macedonia FYR. The panel Dynamic OLS estimator was used to estimate the relation between money demand and real GDP, inflation rate, interest rate, exchange rate and the European Sentiment Indicator. In the benchmark models we used as a proxy for the exchange rate the bilateral exchange rate against euro and USD. Robustness checks were conducted: by replacing the bilateral exchange rate with the nominal effective exchange rate or the real effective exchange rate; by adding the impact of the crisis and by using another methodological approach, the Fully Modified OLS estimator.

The estimates offered some reassuring results regarding the stability of money demand in the CEE countries, when the role of sentiments is included in the estimations. The traditional determinants of money demand (real GDP, interest rate, inflation rate) are significant and carry the expected sign. The income elasticity was significant and close to unity, indicating a nearly proportionate increase in M2 money demand as the level of income increases. The opportunity cost variables-the interest rate and the inflation rate- carry both a negative coefficient, but with a relatively small magnitude. A significant currency substitution effect was identified for the bilateral exchange rates, against euro or USD. However, as expected due to the fact that six out of eight countries belong to the EU during the years covered by the analysis, the exchange rate elasticity is greater in magnitude when the exchange rate against euro is considered. The role of economic sentiments on money demand was found to be significant. The negative coefficient carried by the ESI indicate that an increased perceived uncertainty- reflected by a less than average value for the ESI indicator- determine an increase in the demand for money due to precautionary reasons.

The robustness check section confirmed the validity of the benchmark models. Regardless of the use of different exchange rate proxies, the results were in line with our benchmark models. The only coefficient that changes its significance is the real effective exchange rate, which – in contrast to the benchmark models – suggests the presence of the wealth effect. The results are not different even when we control for the effect of the economic and financial crisis from 2008-2010. Accounting for the effects of the crisis, we observe a decrease in money demand during this period, but only when the exchange rate against euro or USD is included. This result is somehow intuitive, given that in periods of high instability and risk, money holders will chose to direct their holdings towards less volatile assets. In all the specifications, the economic sentiments are significant and invoke the presence of the precautionary motive of holding money.

The research conducted in this thesis was an attempt to offer an updated evidence on the determinants of money demand, by using information on real economic events that may have influenced the function of money demand from the macroeconomic perspective. Some limitations of our study should be mentioned at this point, in order to delineate it from the previous or subsequent works on this topic. We consider the lack of long data series as our main

drawback in applying our working hypothesis. For example, we consider that a comparison between the sample of euro area candidate countries and the EU official candidate countries could have offered an interesting insight on the magnitude of the determinants, with respect to both monetary and European integration. But the lack of data on the sentiment indicator for the remaining of the EU official candidate countries, restricted our area of research. Moreover, the changes that occurred in the context of European integration diminished the role of some variables, for which data series are no longer available, or increased the importance of others, by making available data on new macroeconomic variables. This limits the temporal span, either at the starting point or at the ending point.

In the end, we consider important to move our attention towards the implications of our results from a policy perspective. We started our study having in mind the role that money play in the context of the monetary policy. The conclusions provided in our analysis point towards a stable money demand function in the Central and Eastern European countries, if we account for the characteristics of the current regional economic context. In the country-level analysis (for some countries) we identified some sources of instabilities in the money demand function, sources that were not accounted empirically by simply relying on the traditional determinants considered in the literature. When the attention moved towards the presence of the currency substitution effect in the context of European integration and towards the perceptions regarding the overall economic assessment, the results changed. A stable money demand function was identified when we accounted empirically for the role of economic sentiments in the period that precedes euro area or EU accession.

From a policy perspective, we can state that if we take into consideration the perceived uncertainty in these countries, the extended function of money demand can provide a relatively good explanation for the behaviour of money in this sample of countries. Incorporating individuals' perceptions regarding the future path of the economy and their sentiments related to the evolution of economic aggregate variables in the context of European integration may increase the reliability of the money demand function. By doing that, monetary authorities can gather additional information on money demand and can anticipate unexpected fluctuation in money demand, fluctuations that can not be explained by the traditional determinants. The results we provide in the empirical sections lead to a predictable money demand function in the

long-run, when the perceived uncertainty is included in the estimations by means of the European Sentiment Indicator. The long-run equilibrium relationship among money and the determinants considered in the analysis, are related -from the policy perspective- to a question regarding the usefulness of the money demand in the monetary policy implementation process. Our evidences suggest that money demand is a predictable function and, as a result, it can have an useful informative tool for the monetary policy analysis.

In consequence, the role of money should not be neglected, but reassessed by taking into consideration consumer and investors assessment regarding the overall economic activity inside European Union. The drop in uncertainty regarding the path towards integration and the moment when this will occur, may have a favourable effect on the effectiveness of the ECB monetary policy after the completion of the integration process.

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