Universitatea BABEŞ-BOLYAI

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

FSEGA

FINANCE DEPARTMENT

Abstract

PhD Thesis

STRATEGIES AND POLICIES REGARDING EURO ADOPTION IN ROMANIA

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CLUJ-NAPOCA

2011

SUMMARY

INTRODUCTION

The historiography of monetary integration is already significant. It is expressed both quantitatively and qualitatively through the theorisations necessary in the argumentation of the process, ten years after the introduction of euro. First class works belong to renowned authors, both from the West and from the new member states: Richard Baldwin, Anne Marie Gulde, Miroslav Jovanovic, Robert Mundell, Wolfgang Muckle, Andre Sapir, Malcolm Townsend, Michelle Cini, Ali El-Agra, Jacques Delors, De Grawe, Paul Krugman, Silviu Cernea, Moisă Altar, Ionuț Dumitru, Daniela Beju, Nicolae Dardac, Mugur Isărescu, Daniel Dăianu, etc.

In Romania, the monetary and financial and banking integration literature is at the beginning. But note that this detaches in economic research by the comparative side of analysis and by using quantitative methods, mathematical models, by spectral and temporal analysis based on dynamic correlation defined in the frequencies field, of the graphic representations, of correlation coefficients, etc. This scientific emulation is meritorious, since on medium term (2014/2015), our country has decided to enter the euro area. For this goal to materialise, Romania will have to "integrate interests" and to generate governmental strategies and appropriate monetary policies consistent with those projected by the European Central Bank.

The main objective of the thesis is to assess Romania's readiness for accession to the Economic and Monetary Union and to see how the Romanian monetary policy is correlated for adopting the euro.

Starting from this objective, we also intend to analyse other secondary objectives, such as the degree of preparation of the Romanian banking system for euro adoption. To reach the stage of euro introduction we must meet the imposed convergence criteria. This led us to analyse another secondary objective, but one of great importance, the degree of fulfilment of the nominal convergence criteria.

Another secondary objective that we considered is the analysis of the euro impact on the Romanian economy, more precisely estimating the costs and benefits of euro introduction in our country.

The research that we have developed in the thesis allowed us to outline the benefits of the euro in the euro area with a more nuanced analysis of financial markets, trade, investment, fiscal policy. In the thesis we extend the research on the factors that contributed to the international status of the euro currency stability, confidence in the size and strength of the euro area economy and its integration in international terms. Our analysis has confirmed Issing, 2008, and Freivalds, 2009, regarding the size and openness of the euro area financial market.

A vast literature was available to us during the doctoral internship in 2010 at the Economic University of Vienna, at the Institute for Austrian and International Tax Law. The scientific contact with specialists from the prestigious Viennese University allowed us to verify our scientific hypotheses and to simulate several applied models that we used in the thesis. The modelling and the simulation of business processes using mathematical functions allowed us to configure the *fuzzy clustering* analysis.

Banks in our banking system do not have a projection on the cost of euro introduction, in short term, medium or long term. This drawback can partially be explained because of the uncertainty that hangs over the euro in euro zone countries, but also due to the uncertain timing of accession to the euro zone.

The results of the research confirmed what the literature had several times outlined, namely that the unilateral shift to the euro is not a real option for Romania, although the business environment in our country adopted the euro and there are many areas where the commercial activity is dominated by the euro. It is no secret that most bank loans on the Romanian market are expressed in euro and that this trend is becoming more and more common. The case study that we conducted in the doctoral thesis using real data processed from a Romanian bank portfolio confirms the above.

The results we have reached confirm the importance of the financial banking system in the process of introducing the euro. It has often been suggested that foreign capital grouping in Romanian banks is not random, but without bringing scientific arguments.

During our research we were concerned about aspects of shock transmission from the euro area. Moreover, the transmission of external shocks has major political implications. In the case of Romania, the evolution of domestic macroeconomic variables and the country's business cycle is largely determined by external factors, which is why these variables should be considered in developing national strategy and policies.

The current economic and financial crisis revealed that it is useful to decode how domestic economy is globally affected by the development of macro and microeconomic indicators.

Our PhD thesis strongly suggests that Romania needs complex assessments before entering ERM II and announcing the date of entry in the EMU. So far no country has missed the announcement of effective entry into EMU. The failure of a public notice from the authorities involves major risks that can lead to a reversal of market or capital flows and undermine economic stability.

Euro adoption in Romania by 2015 also involves achieving a coherent strategy for governments, the National Bank of Romania, the financial and banking system and the business environment.

Our doctoral thesis is part of the literature and, along with warnings, calls for a reassessment of the Romanian banking system potential. The case study that we conducted confirms the achievement of a certain level of preparation of the banking system that Romanian authorities can use to configure the design and the content of integration in the euro area.

A first conclusion is that Romanian literature fits into the general European debate of specialists and that the results are integrated at a European level. Besides, working groups in Romania are generally integrated into the European and regional level ones *(see Euroteam Romania*). However, from the perspective of monetary processes and of the introduction of the euro, the results are not sufficiently communicated or compared with best practices in countries that joined the euro area - Slovenia, Slovakia and recently Estonia.

Our research took into account these limits and explained the financial and banking processes in the euro area and the steps to be followed by Romania in order to enter the euro zone in 2015.

We chose a case study carried out on one of the banks representative for the Romanian banking system, with a Romanian capital majority. The bank that we have chosen is among the first ones in Romania, by held assets, and the analysis that we performed showed us that the trend followed by the bank is relevant for the entire banking system in Romania.

Chapter I

European Monetary Integration. Principles. Requirements. Experiences

In this chapter we have outlined a necessary debate of the implementation issues of the monetary integration on all three levels that we have made a priority in our research – the European general level, located in the area of the European Central Bank in Frankfurt, the Central European level, located in the economic institutions of the countries in the region and the national level developed by National Bank Policies and by governmental policies.

The comparative approach to new member states has allowed us to bring into question a number of problems insufficiently reported in the scientific literature. We have argued that financial services and financial integration issues are a significant part of the agenda of the EU internal market. The essence of this set of problems is to create regulatory legislation for the financial services sector, seen in a vision of European financial markets integration. This is also the great challenge of European integration. The euro has made essential contributions to the integration of money markets, bond markets and stock markets and has brought benefits of low costs in the acquisition of capital for companies. The retail banking market is still divided and crossed by national borders. This reality is reflected by the low volume of loans from abroad. Therefore, positive effects for the population and small businesses are deficient. Although methods of support have been implemented, the existence of national consumer protection rules prevents the development of the common market for its loans.

At the EU level, the discussion concerns consumer directives necessary for harmonising laws, regulations and administrative provisions of the loans. Beyond the legislative barriers, integration is hampered by national language and cultural barriers, but also by other factors such as preference for local suppliers of services, problems in estimating the risk for a customer in another EU state, difficulties in assessing accounts of customers in other member states. Among the problems that slow the integration of the common financial market we mention the relatively slow implementation of European rules in national regulations, the inconsistent implementation of European standards at a national level and the non-harmonization because of the lack of supervisory mechanism for cross-border cooperation of European financial supervisors.

We explicitly pointed out in the research that the main reason why experts and decision makers in European issues require the promotion of tax rules is because of the perpetuation of "sovereign" deficit manifested in the implementation of the fiscal policy by almost all EU countries and governments. The uneven political process in the euro area, the trend of spending more and indebting future taxpayers is the constant practice of the EU government. The main negative consequence of this policy is the accumulation of government debt and the increasing pressure on interest rates seen with long-term negative impact on economic growth.

Chapter II

Strategy and Policies on Adopting the Euro in Romania. The Role of the National Bank and of the Government Institutions

This chapter was dedicated to the analysis aimed at meeting the real and nominal convergence criteria by Romania in the process of adopting the euro.

In the investigation we did not neglect the economic and financial crisis that has affected all countries in the last years, including Romania. We tried, in this sense, to capture the effects of the crisis and the monetary policy strategies implemented by NBR, and public policies. Convergence Programme 2009 – 2012 of the Romanian government, published in February 2010, shows a relative lack of vision and solutions, being limited to quantify challenges. One of them is aimed at reconciling the objective of budgetary nominal convergence criteria in a sustainable way with required measures for limiting the effects of the global financial crisis on our economy. In this regard, the budgetary targets have been directed to mitigate the cyclical economy, reducing inflationary pressures and external deficits limit.

We demonstrated in this chapter that inflation targeting is a successful strategy only through central bank credibility and through an appropriate monetary policy management. We also subscribe to analyses suggesting that inflation targeting requires the use of models designed to help the guidance of monetary policy.

In the case of the Romanian economy, this modelling phenomenon is difficult due to structural changes. It takes a long time until a model gives results. The forecast accuracy is essential, and it depends on the personality of teams and decision makers.

In implementing the new monetary policy strategy, the National Bank sought not only the compliance with the inflation targets set by the Administrative Board following a consensus process conducted with the Government, but also the sustainability of the disinflation process scheduled. In this sense, in implementing the strategy, short-term objectives have been subordinated to the medium and long term ones. In the time since the adoption of the inflation targeting regime, the domestic macroeconomic environment has been burdened by a series of structural changes and shocks from factors outside the influence of monetary policy. The National Bank of Romania was concerned with maintaining financial stability and mitigating external imbalances occurred in the process. Meanwhile, the National Bank of Romania has committed to meet the criteria necessary to achieve the strategic goal of accession to the Exchange Rate Mechanism II and subsequently to adopt the euro.

All the sources we consulted led us to the following preliminary conclusion: it is necessary for the monetary policy to maintain its cautious character in the future. The pace and the adjustment of future interest rates of the monetary policy and of monetary conditions will be correlated with the magnitude of the disinflationary effects exerted by deepening and extending of the aggregate demand deficit and of diminishing the dynamics of inflation expectations. Another important part of the decision to adjust monetary policy instruments is the likelihood of risks attached to the inflation forecast on the time horizon relevant for monetary policy, especially the threat of side effects of the adjustment of administered prices and increased price of fuel. Thus, the NBR will have to act pro-actively in order to anchor the inflation expectations and to ensure the pace of disinflation targets in the medium-term, and creating conditions for a sustainable revival of loaning and sustainable recovery of economic activity. Such a configuration of monetary policy is strictly conditioned on maintaining the macroeconomic policy mix and structural reforms along the lines agreed at the multilateral external financing arrangement concluded with the EU, IMF and other international financial institutions (Convergence Programme 2009-2012, February 2010).

Statistical data analysis confirms the realistic assertions of specialists that conclude that in 2010 and 2011 the adverse effects of the international economic and financial crisis remain. From this perspective based on a modest increase, the need to preserve financial stability and to ensure a sustainable disinflation can be achieved only by rebalancing and increasing the coherence of the macroeconomic policy mix and by accelerating the structural reforms. In what concerns the fiscal policy, its main objectives for 2009 – 2012 regard ensuring the sustainability of public finances over the medium term and equitable intergenerational distribution of taxes and spending, and on short-term to support monetary policy, especially in symmetric operation of automatic stabilizers in order to limit the volatility of the economy, the return of inflation and of interest rate at a low level.

Romania differs from most countries in the region that wish to adopt the euro, because in 2008 it had no major problems on budget deficit and on government debt, precisely in areas where other countries operate the strongest adjustments. Instead, the country had major problems in the area of inflation and interest rates. This asymmetry probably results from a somewhat different strategy of Romania's participation in ERM II compared to that of other countries in Central and Eastern Europe.

To avoid discretionary fiscal policies, the new framework of fiscal responsibility (Fiscal Responsibility Framework – FRF), adopted in 2010 (Fiscal Responsibility Law – Budget), based on rules and procedures on standards regarding transparency and the monitoring mechanisms, is decisive. In a framework of fiscal responsibility, the rules which often refer to the budget deficit and public debt or to multiannual budget programs preparation are included in a medium-term fiscal scenario that is based on realistic macroeconomic assumptions (Daban et al., 2003).

The deepening of the economic and financial crisis led to the rapid growth of Romania's public debt estimated at about 36.7% of GDP, mainly due to the financial aid package from the IMF and the European Union (EUR 19.95 billion), and to domestic loans.

The debt strategy will have to reconcile the constraints where the credibility of the process of economic recovery is crucial. In the absence of policies aimed at economic recovery, the reduction of government deficit, the strengthening of international reserves and the resumption of disinflation, the state budget financing will prove more difficult to achieve. In this context, the

IMF agreement in place and the support the new framework agreement created the conditions for overcoming the recession and resuming economic growth.

The average HICP (Harmonised Index of Consumer Prices) recorded in Romania in April 2009 – March 2010 was of 5%, superior to the reference level of 1%. Its evolution must be analysed in terms of GDP, which has seen robust growth in the last decade and after 2008 has stagnated and even experienced drastic adjustments.

Another unfulfilled criterion is that of long-term interest in national currency. The situation is somewhat predictable given the fact that this criterion is closely related to that of inflation. Moreover, long-term debt instruments are underdeveloped in Romania.

Exchange rate stability depends critically on the inflation criteria. Once inflation was brought to levels consist of a single digit, the exchange rate began to show a degree of stability consistent with this criterion. It is important to note the fact that the relationship between inflation and exchange rate is bi-univocal in the sense that they reinforce each other. In other words, a more stable exchange rate is not only a result of low inflation rates, but by simply going through a nominal depreciation or a lower larger real appreciation, it may lead to a lower inflation rate.

We, like other specialists, found that of the five nominal convergence criteria, Romania fulfils only one. Thus, Romania has to make substantial efforts, without which the euro cannot be introduced.

Romania is not participating in ERM II, therefore there a central parity is not yet defined for appreciating the exchange rate fluctuations in the level of ± 15% (Apostoaie, 2010). The Romanian leu is traded under a flexible exchange rate regime. Compared to the euro, the leu has seen a substantial depreciation in the period of 2008 – 2009, afterwards it recovered slightly. In March 2010, the exchange rate of the leu compared to the euro somehow exceeded the historical averages over the past 10 years.

By analysing the data we can say that Romania is not prepared to join EMU. In what concerns the nominal convergence criteria present in the Maastricht Treaty, Romania has problems with the inflation, the budget deficit and the average nominal long term interest. Moreover, the legislation has not been fully adopted. These problems, along with the unfavourable economic situation in the country and in the world are complicated and delay the achievement of the nominal criteria for euro entry in 2015 in an optimistic scenario.

Chapter III

The Impact of Euro Adoption on the Financial and Banking Environment

In this chapter we focused the research on the contribution of the business environment to accelerating the introduction of the euro.

First we analysed the contributions of Romanian specialists on the *Theory of optimum monetary areas*, and the results they obtained.

We suggest that in the context of enlarging the data set, some changes are required in the econometric methodology, namely:

- *unit root* testing of time series used to take into account the possibility of structural failure (*structural breaks*). There are enough events to justify considering the macroeconomic impact in the analysis of such breaks at different times:

- example. 1: 2004 – 2007 was the period of economic boom, with the climax of Romania's EU entry in 2007, so structural failure may occur somewhere before 1 January 2007 (because of expectations of economic agents) and after (ex-post impact event);
- example. 2: at the end of 2008, the international crisis hit the Romanian economy, so we expect structural breaks in time series at a certain time during this period.

Identification and testing of structural breaks in time is important, because all *unit root* tests (eg, ADF - Augmented Dickey Fuller, PP - Phillips-Perron, KPSS) lose much of their power of discrimination in the presence of this phenomenon.

- treatment of structural breaks can be done in the following ways (see for details zivot & Andrews, 1992, Perron & Zhu, 2005; Lumsdaine & Papell, 1997):

- by direct identification of possible moments for structural failure (based on historical events - economic) and the testing of these candidate moments throughout tests such as Chow, adapted for time series that have *unit root*;
- by econometric instruments and test that identifies endogenously and simultaneously the breaks, without need for the researcher to point out moments of candidate (zivot - Andrews test is such a methodology).

In our opinion, even in the period 1995q1 - 2004q1 enough structural failure may occur in the time series of real exchange rate (on quarterly data). Therefore, conflicting results of the two tests may be due to the presence of structural breaks in the data. Tests should be conducted in subseries of time between two consecutive structural breaks (if the length of time in subseries permitting) or you can use unit root testing technologies that are tailored to series of structural breaks.

As a conclusion regarding the merit of Romanian literature approaches, the problem of structural failure untreated can affect even the results of studies on the Balassa – Samuelson done on time series until 2004.

Another important observation concerns how the estimation Balassa – Samuelson effect was done in Romania:

- one method is based on the univariate Hodrick – Prescott filter: variables are undistorted by the filter and then multivariate , respectively bivariate VECs are estimate. The approach is correct, but the question remains if there can be a model in which to make variables filtering based on Kalman filter. This is a multivariate filter which takes into account the relationships between various macroeconomic variables;
- the Kalman filter implementation is an approach that depends on the robustness of results. The conclusions will be truly robust if confirmed on a qualitative level by a methodological approach involving the Kalman filter. If we extend the data set, it is advisable to add the methodology used by Alexander-Chidesciuc Codirlaşu and a filtering model in which the variables to be based on Kalman filter.

In a comparative perspective, Balazs Égert analysed the influence of differential productivity on inflation and concluded that the Czech Republic, Slovenia and Slovakia, the phenomenon of B – S resulted in an increase in inflation by about 1.5 percentage points. In the case of Hungary and Poland, he considers that the phenomenon of B – S was higher, contributing to inflation by about 3.8 percentage points, while in Romania, the effect of B – S record 1.43 percentage points (Égert, 2001:361-379).

In order to observe business trends in Romania and the way in which the economy and population react to the euro zone integration, we considered appropriate the use of the *fuzzy clustering* analysis for the two indicators: the industrial confidence and consumption per capita.

We considered that in the classification process two sets appear: a set of objects X and a set of objects Y. We will note by $X = \{x^1,\ldots,x^p\} \subset R^d$ the set of objects to be classified. The feature set is $Y = \{y^1,\ldots,y^d\} \subset R^p$. y_j^k, which is the value of the k characteristic regarding the object j, so that we can write $y_j^k = x_j^k$.

Applying the *cluster theory* in the area of monetary integration, real convergence, referring to the financial and banking field, industrial field, etc. we have reached the most interesting conclusions, which we illustrate below throughout two sets of indicators – industrial indicator and consumption per capita. Of course, our analysis will continue on other indicators.

The results we obtained allowed us to group countries (except Ireland, whose data was not released by Eurostat) in several groups, as shown in Figure 1 (data from which the figure and the table were designed were processed in the laboratory according to the methodology described above). The membership of countries based on the processed data can be seen in the table below.

Figure 1. **Classification of countries according to the industrial confidence indicator**

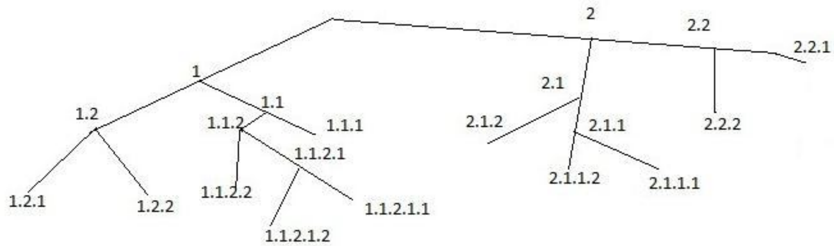


Table 24. **The countries membership according to the industrial confidence indicator**

<table>
<tr><td colspan="6">1
PT, ES, PL, BG, LT, RO, EL, LU, FR, CY, LV, BE</td><td colspan="5">2
ML, SL, DE, FI, SK, EE, CZ, HU, DK, SE, UK, AT, NL, IT</td></tr>
<tr><td colspan="4">1.1
PT, ES, PL, BG, LT, RO, FR, CY, LV, BE</td><td colspan="2">1.2
EL, LU</td><td colspan="3">2.1
DE, FI, CZ, EE, ML, SE, SK, DK, SL</td><td colspan="2">2.2
HU, UK, AT, NL, IT</td></tr>
<tr><td rowspan="3">1.1.1
RO, CY, FR, LV, BE</td><td colspan="3">1.1.2
PT, ES, PL, BG, LT,</td><td rowspan="3">1.2.1
EL</td><td rowspan="3">1.2.2
LU</td><td colspan="2">2.1.1
DE, CZ, EE, SE, FI</td><td>2.1.2
ML, SK, DK, SL</td><td>2.2.1
HU</td><td>2.2.2
UK, AT, NL, IT</td></tr>
<tr><td colspan="2">1.1.2.1
ES, PL, LT</td><td rowspan="2">1.1.2.2
PT, BG</td><td rowspan="2">2.1.1.1
DE, SE, FI</td><td rowspan="2">2.1.1.2
CZ, EE</td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>1.1.2.1.1
PL</td><td>1.1.2.1.2
ES, LT</td></tr>
</table>

As we can observe from the analysis, in terms of confidence indicators by sector and industrial confidence indicator, Romania falls into a group which also includes Portugal, Spain, Poland, Bulgaria, Lithuania, Greece, Luxembourg, France, Cyprus, Latvia and Belgium. This is not surprising, given that economic relations with these countries are quite developed. Moreover, in the subgroup that Romania was included in, we see that we are positioned close to France, one of the strongest investors in Romania. Through the results we can say that a correlation with the French economy is favourable. The results indicate a closeness of Romania to Greece, due to Greek companies and investments that are carried out in Romania (Greece is the third largest investor in the banking market in Romania). This may lead to questions, if we take into account the economic crisis that is affecting Greece at present. Unfortunately, the correlation does not continue with the other countries which Romania has strong economic partnerships with, such as Austria, the Netherlands and Germany. They lie on the other side of the system along countries like the Czech Republic and Hungary, countries that have become a priority for the German group (Germany and Austria).

We continue with the analysis of the real convergence criteria and we analyse the group in which Romania is located by observing the *per capita* consumption increase, taking as a reference the year 2000. In the analysis we also included the member states of the Common European Area – Iceland, Norway, Switzerland, former Yugoslavia countries and Turkey.

The results obtained from processing the data from the database of the European Union (Eurostat) according to *fuzzy clustering* model can be observed in Figure 2.

Figure 2. **Classification of countries according to per capita consumption indicator**

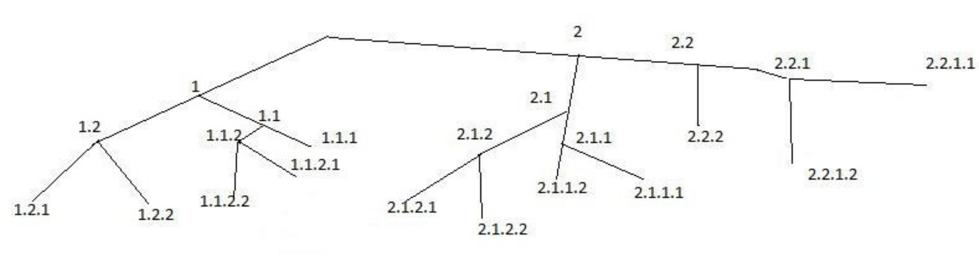


Table 25. **The countries membership according to per capita consumption indicator**

<table>
<tr><td colspan="5">1
LT, EE, LV, RO, BG</td><td colspan="7">2
FR, ML, AT, ES, DK, PT, BE, NL, DE, NO, UK, YU, CY, LU, IS, IT,
SE, SL, CH, IE, CZ, EK, TR, PL, FI, HU, SK</td></tr>
<tr><td colspan="3">1.1
LT, EE, BG</td><td colspan="2">1.2
RO, LV</td><td colspan="4">2.1
ML, AT, BE, NL, DE, ES, LU, IT, CY, FR,
DK, IE, CH</td><td colspan="3">2.2
NO, EL, SL, CZ, UK, SE, PL, HU, TR, YU, SK, FI, IS</td></tr>
<tr><td rowspan="3">1.1.1
BG</td><td colspan="2" rowspan="2">1.1.2
LT, EE</td><td rowspan="3">1.2.1
RO</td><td rowspan="3">1.2.2
LV</td><td colspan="2">2.1.1
NL, BE, DE, LU, IT, CY, PT, ML, AT</td><td colspan="2">2.1.2
ES, FR, DK, IE, CH</td><td colspan="2">2.2.1
EL, SL, CZ, PL, HU, NO, SK</td><td>2.2.2
UK, SE, FI, IS, TR, YU</td></tr>
<tr><td rowspan="2">2.1.1.1
BE, DE, ML, AT</td><td rowspan="2">2.1.1.2
NL, BE, LU, IT, PT</td><td rowspan="2">2.1.2.1
ES, IE</td><td rowspan="2">2.1.2.2
FR, DK, CH</td><td rowspan="2">2.2.1.1
EL, HU, SK</td><td rowspan="2">2.2.1.2
SL, PL, CZ, NO</td><td rowspan="2"></td></tr>
<tr><td>1.1.2.1
EE</td><td>1.1.2.2
LT</td></tr>
</table>

(Source: author's analysis based on Eurostat data)

If we are to analyse the data set and the result, it can be observed that most countries in Central and Eastern Europe are grouped in the second table, many of them (Slovenia, Poland, the Czech Republic) forming a special group that cannot be separated. We can see that very close to this group there are Hungary and Slovakia. Consumption per capita has increased over the past year in these economies also due to the low share of indirect taxes, leaving freedom for the market and allowing prices to be determined only by inputs.

In what regards the class in which the new member states of the EU are situated, we see that the most advanced countries in terms of economy are also highly clustered – Germany, Austria, Switzerland, France, the Netherlands, Denmark and Belgium (extrapolating we could include even Ireland).

Romania is at the other end, in a group that includes Lithuania, Latvia, Estonia, and Bulgaria. Romania was often included along with Bulgaria, both countries having entered the European Union at the same time and having the same structural problems. It is no wonder that Romania and Bulgaria began to increase indirect taxes (on consumption), while decreasing the share of direct taxes in total taxes collected by the state. As a first step, Romania would have to decrease consumption taxes and rely more on direct taxation of profits and income trend that started in Europe 10 years ago. This measure can bring Romania closer to other countries that are far ahead, in terms of real convergence criteria.

Chapter IV

An Analysis of the Monetary, Financial and Banking Correlations Concerning the Adoption of the Euro

The case study we conducted was done on one of the top five banks in the Romanian banking system. Valuable judgments in the paper are supported by the case study. Interpretation of statistical data series shows once again the poor expression of our economy, still far from the moment of introducing the euro.

All tables and graphics in this chapter are contributions of the author. They will complement the information about the euro, analysed by professional historians in our country. The data we used shows that the banking system – with its few bank-owned Romanian capital and subsidiaries – is ready for the euro.

We used three sets of simulation data:

- at a micro level, the credit institution's model review;
- at a macro level, the Romanian banking system model;
- at a European level, the European Central Bank model.

We distinctly followed the evolution of the same indicators (comparative values) on each level, so that finally, by comparison, we were able to formulate the necessary conclusions. We used a data set with an observation period of four years, consisting of 48 observations, meaning monthly values for the interval January 2007 - December 2010. (For 2011 many values are not processed or are provisional values (NIS, NBR, ECB), for which the period of observation is limited to December 2010).

We worked with time series for which we calculated regression indicators. Given the evolution of different indicators, we used three methods for determining the regression:
- linear model;
- exponential model;
- logarithmic model.

In this abstract we exemplified, based on the bank data used in the case study, just a few elements of our research – loan evolution in domestic currency (Fig. 23).

The evolution of credits allowed us to see that if we divide the observation period into three sub-periods of credit developments: first: 2007 – June 2008, second: June 2008 – January 2009; third: January 2009 – December 2010, we have a faithful image of the Romanian economy. In the first period, the trend is exponential and corresponds to a growth with a maximum rhythm of the three models, since it took place during the boom period. In the second sub-period, economic growth slowed down, but remained steady in the sub-period. Regarding the third sub-period, we notice a decrease from the first period (first half of 2009), and then a logarithmic increase in the final curve period. Mathematically speaking, the slope of the three periods in the first subinterval is minimal, and the last sub-period has the minimum slope of growth.

We calculated the correlation indicators for a wide range of issues. Each correlation was considering a deterministic parameter (x) and the resulted one (y). The purpose is embodied in the correlation indicator that expresses the intensity of the relationship between the two time series analysis.

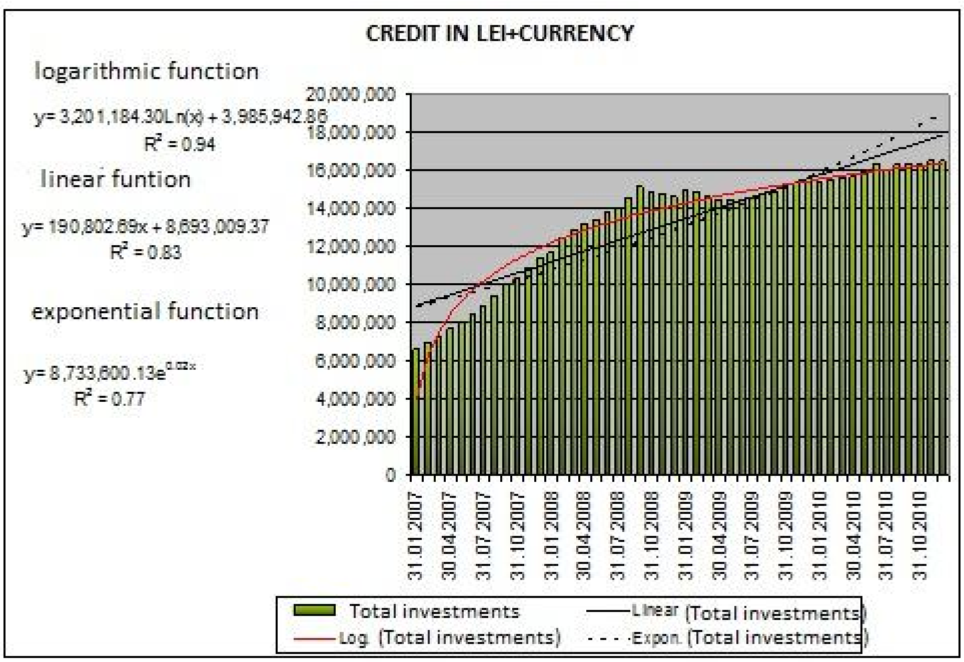
The calculation of correlation coefficient was obtained with the formula:

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{n(\sum x^2) - (\sum x)^2}\sqrt{n(\sum y^2) - (\sum y)^2}}$$

where n = the number of observations (in our case n = 48).

Another aspect followed in the case study was related to the trend of constant currency savings. Since $R^2 = 0.96 > R^2 = 0.92$ than is in the regression for the series as it is in domestic resources in lei, it shows that the attracted resources (savings funds in banks) in foreign currency in recent years support more the constant (linear) growth of total resources. In other words, the savings in domestic currency prevail. On the other hand, it is a positive element in the idea of transition to the euro in the future (should we consider that the savings in foreign currency translate into savings in euro, as the remaining share of exchange used as money saving is insignificant – less than 10%).

Figure 23. **Evolution of credits in lei + currency**



It can be seen from Figure 23 that in the total loan portfolio, the best regression (R^2 = 0.94) follows the same logarithmic growth, in other words there is no increased appetite for foreign currency loans than for loans in lei, the motivation being the same: customers are more cautious during the economic crisis.

It can be seen from Figure 22 that in the total credit portfolio of resources, the best regression (R^2 = 0.96) follows the same linear growth, in other words there is a tendency of constant currency savings. Since R^2 = 0.96 > than R^2 = 0.92 as it is in the regression for the series in lei resources, it is showed that attracted resources (savings funds in banks) in foreign currency in recent years support more the constant (linear) growth of total resources. In other words, the savings in domestic currency prevail. On the other hand, it is a positive element in the idea of euro transition in the future (should we consider that the savings in foreign currency translates into savings in euros, as the remaining share of exchange as money saving is insignificant – less than 10%).

Another followed in the case study was related to:

- the correlation of resources in euro, mobilised in credit institutions in the Romanian economy with the ones mobilised in credit institutions in the euro area of European Union. In this case the correlation indicator is:

- R = 0.898918

- the correlation of credits in euros in the Romanian economy with those granted by credit institutions in the euro area European Union. In this case the correlation indicator is:

- R = 0.859527

A conclusion shows that there is a close connection in terms of the trend of the two pairs of corresponding statistical series in order to prepare the changeover.

The changeover involves an alignment to the values of indicators in the EU. In the case study we conducted a broad parallel between long-term interest rates (they were always characterized by additional stability in the short term), and between inflation in Romania and the EU.

This also confirms that the parallel between interest rates and inflation in Romania and in the European Union has a direct connection, reflected in a correlation index:

- R = 0.626135

Of course, this is an expression of economic globalization, the interdependence of economies, of the influence of the economic crisis, but looking distinctly, the inflation in Romania can be seen more clearly above the normal levels and relapse periods above the average level in EU. The existence of the conditions of integration and the changeover involves correlation index values closer to 1.

In what concern the correlation between long-term interest of Romania and of the European Union, there is not a direct link; on the contrary, it is an indirect one and it results in a negative correlation index:

- R = -0.27657

In this case, in order to consider Romania's economy ready for the changeover, we need correlation index values closer to 1, with positive values.

Finally, the research presents the specific processes of Romania’s euro adoption, in the casuistry of broader processes of this type in Central Europe, and from this perspective it has a strong comparative background (Waters 2008:43-44). We have not used this method only for simple emphasis on similarities and differences between Eastern and Central European countries in the process of adopting the euro, but because of the need to innovate through this process and to highlight the original elements of the region. For this purpose, in the comparative methods used in the research, we borrowed many elements from other social disciplines – humanities, such as sociology or political science, namely the interdisciplinary field. Equally, the comparative methods approach encouraged us to permanently assign monetary, financial and banking processes of our analysis in time intervals (Ragini 1989:73).

One of the advantages of using comparative methods is that the research we have conducted, used a variety of sources - primary and secondary. Given its diversity, the comparative approach has become a focus of excellence that has guided us and hierarchies the sources we used. This is also the central research approach – European at our level. We noticed this trend during the doctoral internship in the European Tax Law Institute in Vienna which we already mentioned.

The sources we have investigated there certified us the actuality and the importance of the theme dedicated to monetary integration in the economic research and allowed us to check the methodology we accessed, based on qualitative and quantitative methods. The comparative method is very used in literature, and even if it does not claim to investigate the issue of "big theories" (which describe the society as a whole), it has certain facets of research at the level of the "medium theories," dedicated to the monetary policy. Many of the identified variables have become conclusions of economic research vanguard (Ragini 1989:169).

CONCLUSIONS

Given the exceptional importance of the euro, of the monetary integration process for European construction today, but also for the future of EU, in this thesis we paid attention to the stage of transition to the euro countries in former communist Central and Eastern Europe countries, of course, with focus on Romania. We were interested in monetary and financial matters, in policies adopted by central banks in the area, in governmental strategies adopted by executives of the Member States in adopting the euro. Finally, we focused on the involvement of business in support of adopting the euro in each of these countries, in administrative measures, and in the steps of euro adoption in cultural processes that includes collective mentalities. Given the broad range of issues addressed, by the systematization and by the econometric modelling we used, we recorded and quantified the monetary integration on the one hand, and on the other hand, we brought throughout the opinions we have made, some necessary clarifications and contributions to historiography of the problem, mainly at the Romanian level.

Through the research we have initiated we have shed light on the financial and banking processes of the euro area and the steps to be followed by Romania, which wants to join the euro area in 2015.

It is not encouraging that the Romanian Government's Convergence Programme 2009 - 2012, published in February 2010, shows a relative lack of vision and solutions, being limited to quantifying challenges. One of them is aimed at reconciling the objective of nominal budgetary convergence criteria in a sustainable way with required measures in decreasing the effects of global financial crisis on our economy. In this regard, the budgetary targets are directed towards diminishing the cyclicity of the economy, reducing inflationary pressures and external deficits limit.

We demonstrated in this study that inflation targeting is a successful strategy only through the credibility of the central bank and through an appropriate monetary policy management. We also subscribed to the analysis that suggests that inflation targeting requires the use of models designed to help the guidance monetary policy.

The issues that we have made clear, especially those from the business, financial and banking fields, exemplified in a case study conducted on a Romanian bank, show the country’s readiness in adopting the euro. This is the first case study in literature on the integration of Romania's banking system in euro adoption. With the help of the application that we made using the *fuzzy clustering* theory, we have shown the importance of the banking sector in the process of euro adoption.

Along with the partial conclusions in which we have explained the risks in announcing a certain date in the case of failing to meet it, our research is a professed attempt to support the importance of the business, financial and banking systems in supporting the adoption of the euro in Romania. This perspective is more important, as the analysis of the nominal convergence criteria – which Romania did not meet and for which it records a visible "fatigue" and a trend reversal (see inflation for example) – with those of real convergence indubitably leads to the conclusion that Romania is far from entering the ERM II and still far from the transition to the euro, which should be undertaken starting 2015.

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