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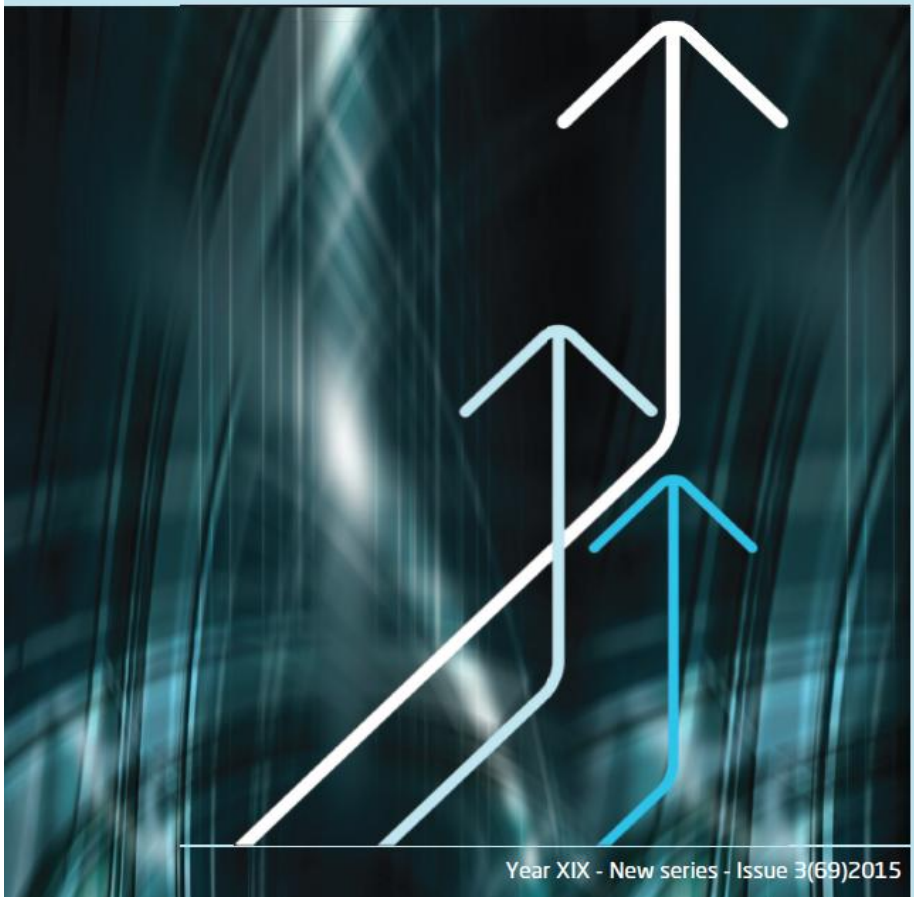

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FINANCIAL STUDIES

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CONTENTS

MONETARY POLICY EFFECTIVENESS IN STIMULATING THE CEES CREDIT RECOVERY

Dan OLTEANU, PhD *

Abstract

This paper aims to appraise the effectiveness of central bank interest rate and quantitative easing measures in boosting private credit recovery from several CEE countries, after the crisis. We found that the monetary policy endeavors significantly succeeded in reducing the money market tensions following the external financial shock. The short-term interbank interest rate strongly responded to the changes in central bank refinancing rate and commercial bank reserves, in all of the analysed countries. Nevertheless, the subsequent links of the transmission chain did not perform as well. Uncertainty in the money market perpetuated a high term spread, while credit risk kept the lending rate at relative high values. The inability of central banks to further stimulate the credit supply put a question mark over the truly factual control of the decision makers on money creation by commercial banks and, consequently, on national economic activity on the whole.

Keywords: monetary transmission, credit supply, Eastern Europe

JEL Classification: E58, E52, E51

1. Introduction

Reviving lending activity is one of the main objectives towards which economic policy in the European countries has been focused, during the recessionary waves following the global crisis. Various empirical studies have explained how the tensions arising in the financial markets led, on the supply side, to a drastic decrease in credit availability, *i.e.,* a credit crunch. Subsequently, indebtedness of economic agents, low income, and negative expectations of business activity and profits further prevented the credit recovery - both on the supply and demand side - although the liquidity crisis came to an end. When commercial bank credit supply and potential borrower credit

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demand are both waiting for the real income revival, but the growth of the latter is subject to credit recovery, central banks have the difficult task of breaking the vicious circle. Such moments are opportunities to assess the effectiveness of monetary policy instruments and also to study the changes in the policy transmission mechanisms due to unprecedented developments of financial systems, financial innovations etc.

The European countries, notwithstanding that they did not constitute the epicenter of the global crisis, they were seriously affected and still experience its effects. All the more so since some of them - the emerging countries of Central and Eastern Europe (CEE) - were in the middle of a financial deepening process at the crisis onset. Such a financial development, characterized by the massive dependence on foreign capital, large current account deficits, excessive credit growth and over-indebtedness of economic agents, is by its very nature a source of economic instability. If we add a financial and trade shocks on this highly unstable economic background, we face a perfect storm indeed.

In these unfortunate circumstances, the CEE countries were "assured" the most drastic domestic product reduction in Europe. Their banking system was severely affected. It faced reserve reductions by cutting external funding together with depositor withdrawals, non-performing assets and capital depletion, along with solvency ratio deterioration. All these led to bank deleveraging, which added up to private sector deleveraging and generated a strong credit crunch. The Central Banks (CBs) have faced – especially on short term –strong currency depreciation pressures caused by net capital outflows, which required large scale spending of foreign reserves. Another challenge was searching for an optimum level of interest rate, high enough to discourage capital outflows, and sufficiently low not to deepen recession. Gradually, with the slowdown of external pressures, the main concern of the CBs became economic recovery in general and credit in particular.

The persistent attempts of the CBs to boost credit, both by policy rate cuts and by quantitative easing, have been shown to have a questionable effectiveness. The volume of new loans, although initially had increased, then stagnated, which prevented breaking the vicious circle formed by credit and the real economy. For this reason, we have proposed in this paper to analyze monetary policy transmission steps in the CEEs, from CBs to commercial banks and, further, to the credit market. Identifying the weak link(s) of the monetary transmission mechanism (MTM) could be useful both

theoretically and for policy makers. We begin by presenting the theoretical framework on monetary policy transmission and obstacles that may arise (section 2). Further, we empirically analyze this mechanism for a group of eight CEE countries in 2007-2013 (section 3). The fourth section summarizes the main findings of the study.

2. Theoretical survey

Theoretical and empirical studies on the effectiveness of MTM and determinants during the crisis are numerous and add up with a vast literature related to financial distress periods, already existing before. According to the old "recipes" for the revival of the economy in descending phases – provided over time by economists as I. Fisher, M. Friedman or B. Bernanke -, recession could be stopped by reflating the economy through interest rate adjustment and quantitative easing measures. The new realities after the crisis, though, show us that pursuing this goal has become a difficult task. As Gambacorta and Marques-Ibanez (2011, p.1) noticed, "*the whole monetary transmission mechanism has changed as a result of deregulation, financial innovation and the increasing role of institutional investors*". Mora (2014, p.112) found that, for the US case, the monetary policy *"pass-through has been significantly weaker since year-end 2008 than during previous period*". Kouretas *et al*. (2014, p.36) also consider that the MTM channels in the Euroarea, USA and UK "*altered and distorted significantly. As a result, the conventional monetary policy become ineffective*". For the CEEs, the literature on the MTM during the crisis is rather scarce. In a previous study (Olteanu, 2012, pp. 8-9) we found a poor performance of monetary conditions in predicting the GDP evolution in Romania during the 2008-2010 period. Also Lyziak *et al*. (2011, p.94) noticed a "*significant drop in the overall monetary policy effectiveness"* in Poland, after the crisis. Regarding to the credit stimulation only, Kara (2012, p.19) reached the opposite conclusion in case of Turkey: "*the CBT has been able to affect ... credit growth ... in the desired direction*".

Bouis *et al.* (2013, pp.7-15) found that the various policy instruments "*could have boosted GDP*" in the OECD countries much more than they have actually done, and this happened because of four factors: (i) a potential decline in the natural real interest rate; (ii) a reduced effect of policy measures on credit cost and asset prices; (iii) the impact of deteriorated balance sheets on both credit supply and credit demand; (iv) a sharp increase in saving rates, due to

uncertainty. These phenomena are related both to the traditional interest rate channel - which concerns the effect of policy rate on demand (investment and consumption) - and to the non-neoclassic narrow/broad bank lending channel (Boivin *et. al*., 2010, pp. 15-22), related to the capacity of MTM to influence the supply of credit. Since the output recovery was strongly related to the credit rebound, this channel has become one of the main concerns of the policy makers, all the more so as stimulating credit had been proved to be a challenging task during recessions.

Various factors interfere with the monetary transmission through bank lending. First, we have the mainstream view represented by Mishkin (2010, p.7) who considers that financial instability occurs only when the shocks to the financial system interferes with asymmetric information, so that the financial system cannot carry out its mission of channeling funds for productive investment opportunities. Second, as Leonardo Gambacorta put it in a discussion organized by the European Research Group on Money, Banking and Finance, "*the bank lending channel had changed a great deal over the last 20 or 30 years*" (GdRE, 2013). In this regard, Romer and Romer (1990, p.12) noticed that "*developments in financial markets … allow banks to be less dependent on reservable deposits to found their lending*". Third, Gambacorta and Marquez-Ibanez (2011) investigated the business model of over 1,000 banks from the EU and the US during 1999-2009 period and found that many structural factors have had interfered with bank credit supply: high amount of short-term funding and securitization activity, high proportion of non-interest income activities, low capital endowment. However, they did *"not detect significant changes in the average impact of monetary policy on bank lending during the period of the financial crisis*" (*ibidem*, p.2).

Finally, although the MTM is successful in accelerating the credit supply, this may be ineffective for stimulating growth if the credit flow is directed - as before the crisis in developed countries - towards non-productive investments (financial assets, real estate etc.). At the same time, the role of banks is crucial as they may direct the liquidities towards the credit market, which will feed the real economy, but they may also invest it in governmental bonds, deposits with the CB, or other risk-free assets. For example, Cecchetti (2010, p.10) was quick to predict a rebound in capital inflows that would revive easy access to credit in emerging markets, but he mentioned that "*a high share of inflows could end up in sovereign bond and bank credit to the government*", not to the non-financial corporate sector.

The short-term interest rate remains the main tool of monetary policy. Since the money creation mechanism had acquired an endogenous character - being determined by the economic activity level - CBs gradually gave up targeting the money supply and shifted to targeting the short-term interest rate, as a mechanism for controlling inflation (Keen, 2009). Subsequently, the failure of conventional policy measures to stimulate lending has given rise to the need for quantitative relaxation, as Croitoru (2013) stated. In the following empirical analysis we deal with the effectiveness of both lowering interest rate and quantitative easing policy measures used by the CBs in the CEE countries.

3. Empirical evidence

Since data on countries' tools of monetary policy are available only for non-euro countries, we confine our analysis to eight non-euro (until 2013) CEE countries: Romania, Bulgaria, the Czech Republic, Poland, Hungary, Latvia, Lithuania and Turkey. In order to assess the monetary policy, we study the dynamics of six indicators:

- refinancing rate of the central banks (%);
- one-day interbank interest rates (%);
- twelve-month interbank interest rates (%);
- lending rate, *i.e.,* interest rate for new loans granted to the private sector (households and non-financial corporations[1]) in national currency (%);
- reserves of the commercial banks (deposits with the CB plus available cash in bank vaults), expressed in national currency;
- credit stock to the private sector issued in national currency, expressed in national currency.

We choose to use the credit issued in national currency only, both for simplifying calculations and for the fact that foreign currency loans substantially rely on an exogenous element, which is the foreign capital inflows. Also, we consider that this component of credit should be stimulated, just as the CEE central bank policy decisions have already proved.

The interest rate set by the central banks for refinancing operations, along with the cash provided to commercial banks are the main tools for credit stimulation. The liquidities injected by the CB are reflected in the bank reserves, consisting of deposits with the CB and

[1] *In some countries, non-financial corporations also include the public ones, so that private credit figures have a small public component.*

vault cash. On the other side, the interest on open market operations is reflected in the interbank rates. Further, the effect of the two policy tools on private credit volume is affected, on *the supply* side, by the commercial banks' interference, through the interest rate on granted loans, besides the eligibility requirements. In this respect, Brown *et al*. (2012), when analyzing the Eastern European credit market, conclude that companies are affected by the high interest rates, high requirements for obtaining credit (including collateral), and slow loan-granting procedures. *The demand* equally plays an important role in accelerating credit, though it is not the topic of this paper. When commercial bank interest rate diminution is not reflected in the growing amount of new loans, the credit demand is usually the impeding factor.

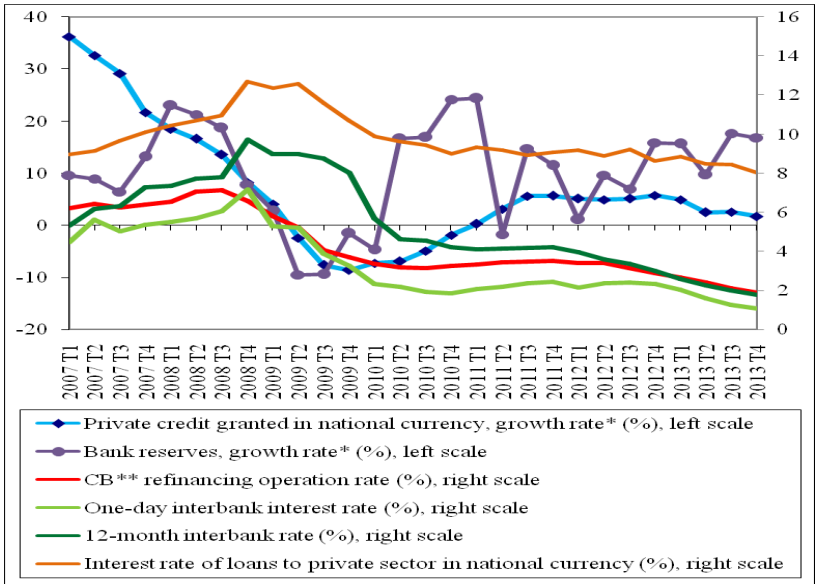
We use quarterly data for the 2007-2013 period. The data sources are the following: for the refinancing rate and the interbank rates - Eurostat and the CB websites; for the interest rate on credit to the private sector[2], the bank reserves, and the credit stock - CB websites. Since credit stock and bank reserve series are non-stationary and include seasonal variation, we use year-on-year growth rates instead of levels. We prefer a narrative analysis to the econometrical alternative, due to the relative short analysed period and to the many qualitative factors involved in the studied issues.

In the next figure we present the average of the CEE countries for each of the six variables mentioned above. The average of bank reserves except Romania, due to the lack of data; as for Bulgaria, the banks' reserves include only the deposits with the CB, for the same reason. In Annex 2 we present separate graphs for each country.

[2] *In Annex 1, we detail the calculation of the lending rate to private sector, which is compiled from interest rates on various types of credit granted to households and non-financial corporations. Since the data were provided by the national bank websites, the indicators used for aggregation are country-specific, so that such detailing is necessary.*

Figure 1

Interest rates, bank reserves and credit recovery in CEE



Source: own calculations, based on data from Eurostat Interest Rates and from the national bank websites.

** compared to the same quarter of the previous year; ** Central Bank. Note: The figures represent simple averages of the analysed CEE countries, except for Turkey due to the extreme values for credit growth and interest rates.*

First, we notice that, between 2007 and 2010, the diminution by over 30 percentage points (p.p.) in the average credit growth rate induced a considerable reduction, by 4 p.p., in the average CB refinancing interest rate, beginning in the mid 2008. The country difference in the size of these adjustments is considerable (see annex 2). It is caused by the various country-specific structural issues at the beginning of the crisis (current account deficit, structural problems of the banking sector, over-lending etc.). For example, in 2008, Bulgaria and the Baltics set pegged exchange rates against the euro.

Therefore, the depreciation tendencies - caused by capital outflow - did not allow for substantial cuts in the interest rate, which would have amplified the pressure on the exchange rate. For this reason, in Latvia for instance, a negative adjustment of over 50 p.p. in

the credit growth rate corresponds with a reduction of only 2.5 p.p. of refinancing interest. By comparison, in Romania, the 50 p.p. increase of credit growth rate imposed a cut by 8 p.p. of the refinancing interest rate. Of course, the changes in the interest rate charged by the CBs are related to the price evolution in each country. Turkey is an illustrative example in this respect; inflation drop from 10.9% per year in Q4.2008 to 5.7% in Q4.2009 required a significant change of the interest rate (-10 p.p.), although the credit decline was insignificant, relative to the other countries.

Further, the graph above and the ones in Annex 2 show a strong impact of the lower interest charged by the CBs on the average money market interest rate. After a crisis-induced hike culminating with a peak in Q4.2008, the one-day interbank rate sharply declined; this trend occured in all of the analysed countries. On the other side, the average 12-month rate was more hesitant to follow the average short term rate, in most of the countries. Between Q1-Q4.2009 the sluggish decrease of the 12-month rate – relative to the one-day rate – had generated high term spreads which, though slowly diminished, persisted until the end of 2012. Taylor and Williams (2008, pp. 5-7) put the high term spread in the aftermath of the crisis on two distinctive factors which are usually associated with financial distress periods: the counterparty default risk in the interbank lending market, along with the lending bank's liquidity risk. Moreover, Eisenschmidt and Tapking (2009, p. 2) explain that, because of the liquidity risk, banks seldom trade on long term and the statistics on the interbank long-term rates did not really reflect the actual rates, but rather the *ask* rates, *i.e*., the rates at which the banks were *willing* to lend. Bulgaria, Latvia and Lithuania are tipical examples of countries where the banking system showed an excessive precautionary behaviour adopted in response to the two mentioned types of risk.

In the long run, expectations of future short-term interest rate use to be the main determinant of long-term rate. A high term spread reveals positive expectations regarding the course of the business cycle because the central bank is supposed to raise the policy rate in response to an overheated economy. But this is not always the case. As Krugman (2010) remarked for the US, the short-term rate has been expected to increase not necessary because of positive economic outlook, but because there was not much room to decrease. Indeed, graphs in Annex 2 reveal that in Bulgaria and the two Baltics, the nominal overnight interbank rate dropped to almost zero, so that it could not have been expected to diminish anymore.

However, a term spread above 2 p.p. - as we can see in Bulgaria, Romania and the Baltics – might suggest that part of it is still due to expectations of economic upswing.

The decline in the average interbank interest was further reflected in the average lending rate, although the effect was not proportional. Figure 1 reveals that, until the end of 2009, term spread raised to more than half of the spread between short-term interbank rate and lending rate. Afterward, the term spread slowly decreased, but the ascending credit risk premium compensated for. The "*abrupt rediscovery of credit risk*" (IMF, 2011, p. 10) became the second cause which hindered the credit supply, after the money market risks described above. Consequently, the difference between the one-day rate and the credit rate persisted.

Bulgaria shows the weakest response of lending rate; although it had a downward trend, the spread against the interbank rate strongly increased starting with the end of 2008; further, the spread began to decrease but very slowly, from the reasons mentioned above. On contrary, in Poland, although the difference between the two indicators increased initially (2009-2010), it returned at the end of the 2011 to pre-crisis values. In the other countries, the difference remained, during the recession period, above that existing before 2009.

By the end of 2009, the decline in the average interest rate charged by the CBs could not stop the drop in the average credit growth rate, although the effect on lending rate was noticeable. An essential factor of this dynamics was the downward evolution of the bank reserves in each country, which added up to the money market risks. The average reserve rate fell sharply during the acute period of the crisis (2008-2009) and took on negative values, for several reasons: because of the insufficiently sterilized currency interventions of the CBs, aiming to defend the exchange rate; because of diminishing deposits, especially term deposits and foreign currency deposits; because of possible migration of excess reserves from eastern European branches to the distressed western headquarters.

Beside the simple bank reserve plummet, some countries like the Baltic ones faced severe banking crises, restructurings, takeovers etc., which prolonged the credit downturn. Starting in 2009 on the average (earlier in the Baltics), the credit in some CEE countries had faced negative rates for a significant period of time: 14 quarters in Latvia, 13 quarters in Lithuania, 12 quarters in Bulgaria, 7 quarters in Romania, and 5 quarters in Hungary. Our figures show that only the

Czech Rep., Poland and Turkey avoided negative quarterly rates (as compared to the previous year) over the analysed period.

We may consider that, earlier (2008-2009), the problems of the banking system –scarcity of liquidities and counterparty default risk – turned the credit crunch into the main cause of the decreasing credit stock. Starting with 2010, the mitigation of the liquidity crisis in the interbank market, along with the return of the bank reserves to a rising trend, stopped the decline of the average credit growth rate (except for the Baltics). At the beginning of 2011 the average credit rate became positive, but its ascending trend only lasts up to Q3.2011, when a ceiling of around 5% was reached.

The major potential causes which obstructed the lending activity were the following: first, the plunging incomes and asset prices deteriorated the balance sheet of households and companies and limited the volume of new loans (the broad credit channel). Second, ascending credit risk offset the effect of decreasing tensions in the money market and kept the lending rate at relative high values. Third, as Brown, M. *et al.* (2012) revealed, credit decline in the CEE countries was due, among others, to the drastically tight collateral requirements and lending standards. Fourth, the endogenous part of credit dynamics - the demand from the private sector – had been waiting for a strong recovery of incomes (real economy) and it might have become the major hindering factor for credit recovery. Thereby, the vicious circle credit-output has hampered the revival of both indicators.

Further, a new decline of credit rate began in 2013, despite that subsequent adjustment of the refinancing rate had already started at the end of 2012, and that the bank reserve rate was rising. The effect of policy rate on credit growth remained insignificant, though there were major differences among countries. For example, Bulgaria and, especially, Turkey, succeeded in 2013 to keep a rising trend and positive credit growth rates. On the other hand, Latvia resumes negative rates. In general, we may say that, in most of the considered countries, neither the CB interest rate adjustment nor the injected liquidities could produce the expected effect of credit stimulation until the end of considered period. This might not necessarily mean that the policy rate has no longer been effective, but that a prolonged period of lower interest was needed for the credit to respond, as it happened in 2010-2011. Also, credit demand is supposed to have played a major role in this dynamics, as before.

4. Conclusion

We may consider that, after the acute stage of the crisis (2008-2009), the monetary policy endeavors in stimulating the CEE credit rebound was significantly effective. By "effective" we mean that they succeeded in reducing the money market tensions following the external financial shock. The short-term interbank interest rates strongly responded to the changes in CBs refinancing rates and commercial bank reserves, in all of the analysed countries.

Nevertheless, the subsequent links of the transmission chain did not perform as well, but this was not the CBs' fault. Uncertainty in the money market perpetuated high term spread up to the end of 2010, and credit risk kept the lending rate at relative high values. Also, the private sector low demand - due to low incomes and shrinking asset values – and drastically tight collateral requirements and lending standards further prevented credit to recover.

The inability of the CBs to deal with the above issues put a question mark over the capacity of the decision makers to manage the national economy anymore. The real question is not whether the monetary policy has been effective or not, but whether the national banks are still truly in charge. Without a real control of the CBs on the money creation by commercial banks, the CEE lending and economic activity on the whole have become exogenous variables. Moreover, these countries are candidates for the Eurozone membership, which will involve losing the remaining monetary autonomy (interest rate and exchange rate). All these restraints, along with the capital account liberalization, will throw the stability of this group of economies at the mercy of foreign-owned banking system and international money masters.

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ANNEX 1

Methodological notes on the interest rate for loans to the private sector, and the source of statistical data

The interest rate for loans granted to the private sector was calculated by aggregating the interest rates on different types of loans granted to non-financial corporations and households. Data were taken from the national bank websites, so that the indicators used in the aggregation process are different from country to country, as follows:

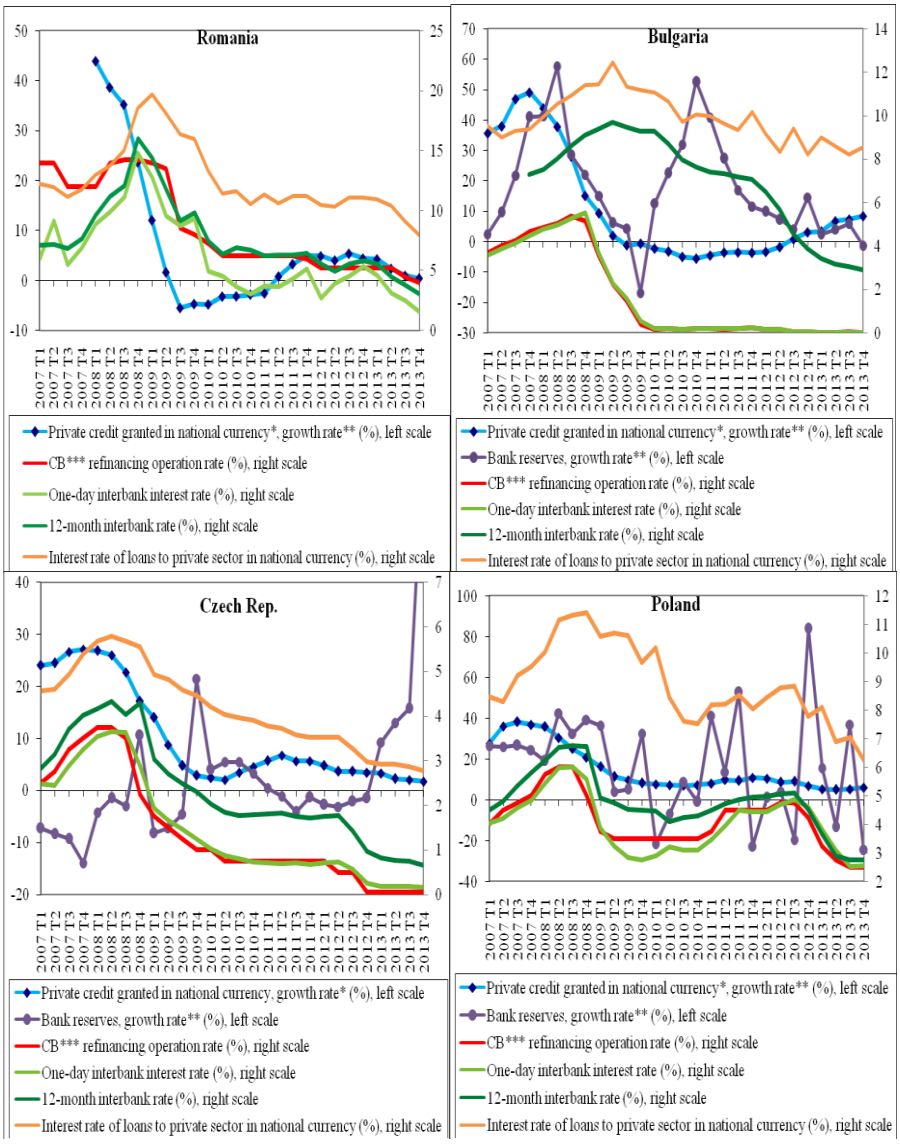
- Romania - the average of the interest rates on loans granted in national currency to non-financial corporations and to households, *unweighted*, due to the lack of data on the volume of new loans. Data source: http://www.bnr.ro/Baza-de-date-interactiva-604.aspx.
- Bulgaria – the average of the interest rates on loans granted in national currency to non-financial corporations and to households (for consumption, for house purchases and other destinations), weighted by the volume of new loans. Data source: http://bnb.bg/ Statistics/index.htm.
- The Czech Republic - the average of the interest rates on loans granted in national currency to non-financial corporations, to households, and to non-profit institutions serving households, weighted by the volume of new loans. Data source: https://www.cnb.cz/en/statistics/.
- Poland - the average of the interest rates on loans granted in national currency to non-financial corporations and to households, weighted by the volume of new loans. Data source: http://www.nbp.pl/ homen.aspx?f=/en/statystyka/oproc/oproc.html.
- Hungary - the average of the interest rates on loans granted in national currency to non-financial corporations (repos, bank overdrafts, and other loans) and to households (repos, bank overdrafts, loans for consumption, loans for house purchase, loans for other purposes), weighted by the volume of new loans. Data source: http://english.mnb.hu/Statisztika/data-and-information/mnben _statisztikai_idosorok.
- Latvia - the average of the interest rates on loans granted in national currency to non-financial corporations (overdraft credit, revolving credit, extended credit card credit, loans up to 0.25 million euro, loans over 0.25 million euro and up to 1 million euro,

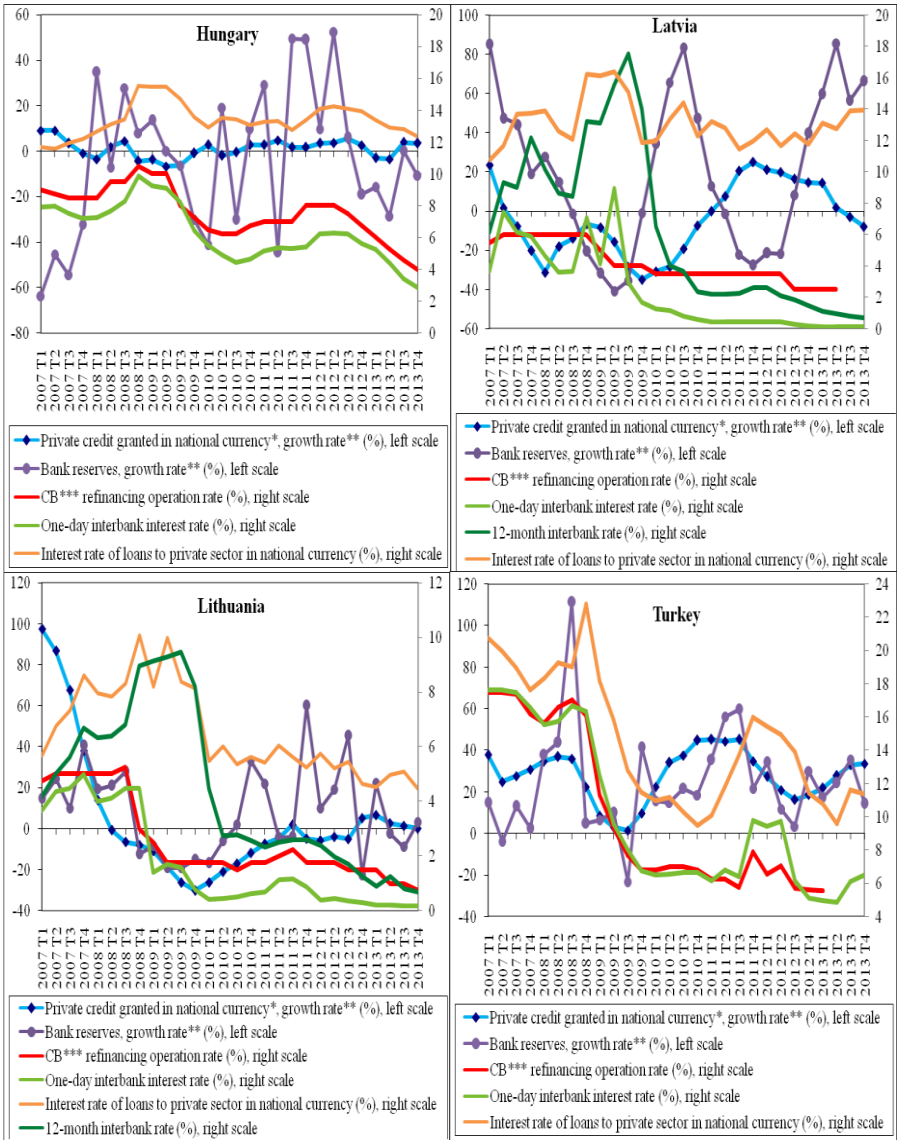
loans over 1 million euro) and to households (overdraft credit, revolving credit, extended credit card credit, loans for house purchase, consumer loans, other loans), *unweighted*, due to the lack of data on the volume of new loans. Data source: http://www.bank.lv/en/ statistics/data-room/main-indicators/mfi-balance-sheet-and-monetary-statistics-data-until-december-2013.

- Lithuania - the average of the interest rates on loans granted in national currency to non-financial corporations and to households, weighted by the volume of new loans. Data source: http://www.lb.lt/ monetary_financial_institutions_ loans_and_deposits _statistics.
- Turkey - the average of the interest rates on business loans granted in national currency and the interest rate on consumption loans granted in national currency (personal, vehicle and housing loans), *unweighted*, due to the lack of data on the volume of new loans. Data source: http://evds.tcmb.gov.tr/index_en.html.

ANNEX 2

Interest rates, bank reserves and credit recovery in CEE





** Except for Turkey, for which we used the total credit, due to the lack of data;*
*** compared to the same quarter of the previous year; *** Central Bank.*
Source: own calculations, based on data from Eurostat Interest Rates and from the national bank websites.

FEATURES OF THE ROMANIAN FINANCIAL SYSTEM REGARDING THE INTEREST RATE TRANSMISSION[1]

Gabriela PREDA, PhD*

Abstract

The monetary impulse transmission channel represented by the interest rate channel transmitting effects of the changes in the interest rate structure on investment as well as on components of the aggregated demand is a classic theme of the present economic literature. Through the investigation of the characteristics of interest rate transmission mechanism, our paper becomes important because the present financial crisis has a mainly weakening impact on the efficiency of the transmission between the inter-banking market exchange rate and the non-banking exchange rate. Our main goal in this research is to emphasize the characteristics and structure of the Romanian banking system (level of concentration), the lending activity of the economy private sector and the saving/investing behaviour of the economic agents that have a direct influence among the reaction of the interest rate flow from the inter-bank monetary market towards the interest rates for the client's lending and deposits of the Romanian banking sector. The exact acknowledgement and the understanding of factors that influence the credit institutions behaviour and the market reaction to the Central Banks decisions have serious implications in the monetary policy efficiency.

Keywords: banking system, interest rate, exchange rate, monetary policy

JEL Classification: E32, E42, E52

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1. Introduction

The monetary transmission mechanism policy is composed of the totality of economic channel through which the monetary policy influences the macroeconomic index of the real economy. The structure of the financial system determines the way the monetary policy shocks are absorbed by liquidities and financial market prices and further transmitted to macroeconomic conduct.

The main focus both for theoretic level and practical level in what concerns monetary policy has to be circumscribed to its efficiency and analysed as a whole.

Antohi, Udrea and Braun (2003) and Cecchetti (1999), Cocris and Nucu (2013) present in their papers the importance of the features in relation to the financial system.

The changes in the Romanian financial system, beginning in 2000, had a positive impact on the interest rate channel, increasing its effectiveness, according to an earlier study conducted by Antohi, Udrea and Braun on the assessment of the monetary transmission mechanism.

2. The monetary policy transmission mechanism characteristics

The impulse of a decision made by monetary authorities at time t takes on the form of a response of certain financial variables at time t + m, in a certain direction and of a certain extent, of a specific length and persistence.

In the Monetary Union countries, asymmetries in the financial structure of their economy are first caused by regulatory discrepancies, and then by the features of the financial markets (Cecchetti, 1999).

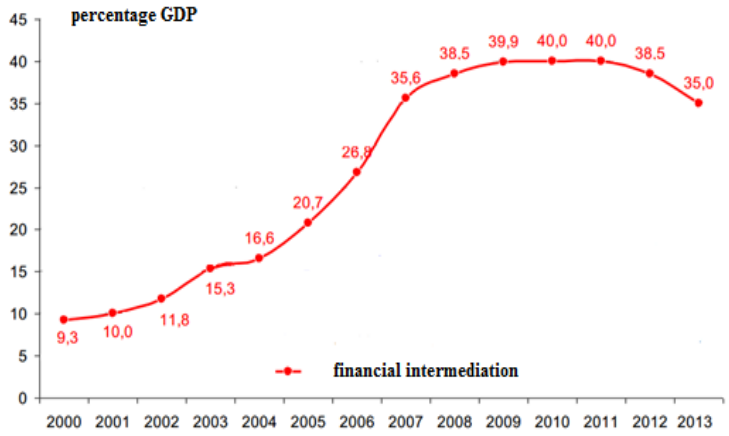
For quantifying the financial development of an economy, literature focuses on two important indicators: **monetisation level of an economy** (computed as weight of aggregate M2 in GDP) and **financial intermediation level in Romania** (weight of non-governmental credit in GDP).

The main beneficiaries of financial intermediation are non-financial companies and the population, while the credit institutions hold a dominant position in supplying financial resources.

The evolution of financial intermediation in Romania between 2000 and 2013 is shown in the next figure.

Figure 1

Dynamics of financial intermediation in Romania



Source: NBR, own computation

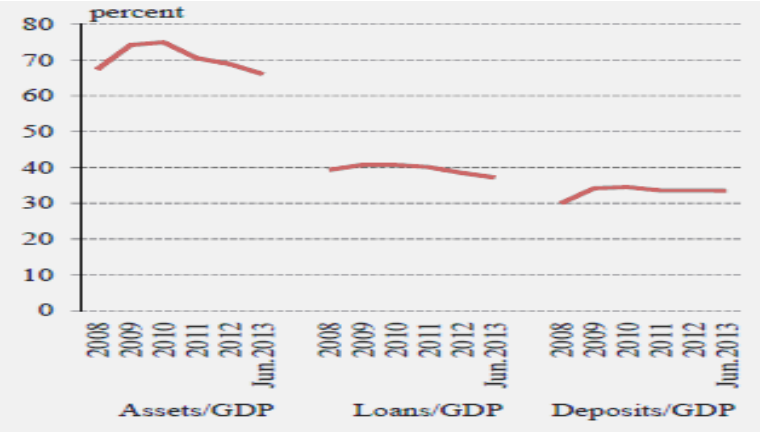
As regards the financial intermediation, even if it considerably increased during 2000-2013 (from 9.3 percent in 2000 to 40 percent in 2011, encountering a decrease of 5 percent at the end of 2013), its level remaining low, acknowledging significant differences as opposed to Central and Eastern Europe.

Also, we notice the prevalent position of the financial banking institutions in Romania. After Romania's transition to the market economy, the number of credit institutions and the mostly private-owned institutions increased and they maintained the dominant position in the financial system.

Even so, if compared to the other member countries (as shown in Figure 3), the financial intermediation level in Romania (Figure 4) is still below the EU-28 average.

Figure 2

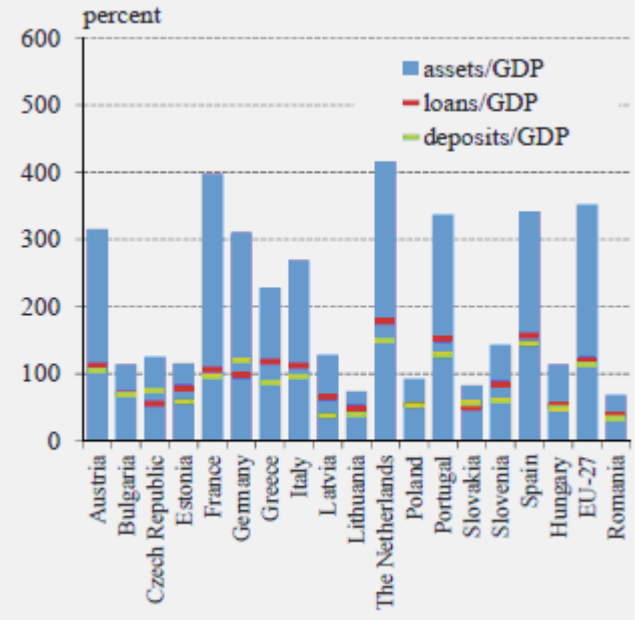
Financial intermediation level in Romania



Source: NBR (2013 Report on Financial Stability)

Figure 3

Financial intermediation level (international comparisons)



Source: NBR (2013 Report on Financial Stability)

As regards the financial intermediation level of the credit to the private sector as weight in GDP, it diminished (from 38.4 percent in December 2012 to 37.1 percent in June 2013).

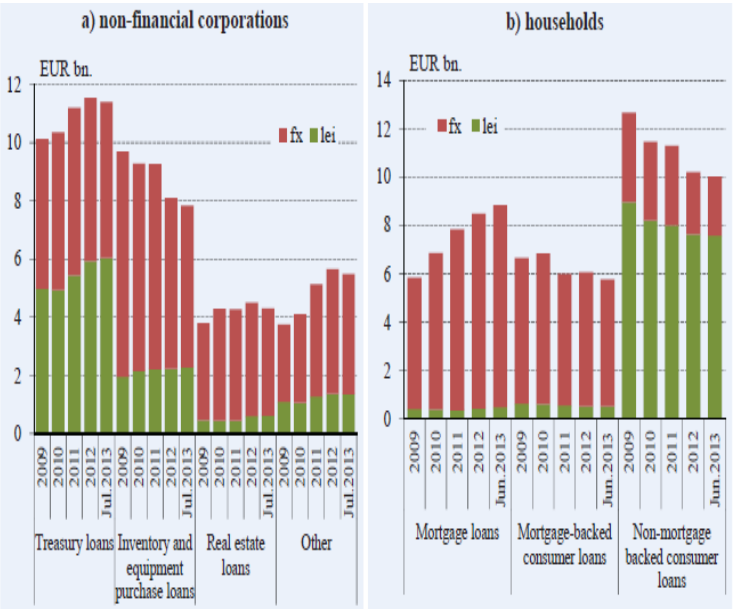
The slightly lowering trend is mostly caused by poor lending activity of the Romanian banking system. The weight of the deposits from companies and population in the GDP is similar to that over the 2011-2013 period.

The significant weight of foreign currency lending is a vulnerability of the Romanian banking sector, worsened by the present financial crisis; but it began to diminish both in relation to the credit granted to financial companies and to the population.

As shown in Figure 2, the credit granted mostly in foreign currency consist mainly of credit for real estate investment (to non-financial companies) and mortgage credit, *i.e.,* mortgage-guaranteed consumption credit (to the population).

Figure 4

Loans granted by credit institution, by destination and denomination, between 2009 and 2013



Source: CRC, NBR

Source: Monetary Balance Sheet, IFN Balance Sheet, CRC, Credit Office, NBR computations

Another important factor influencing the transmission of interbank interest rates to those used by credit institutions for the non-banking customers' sector is the level of competition between banks. In this regard, the evolution of the Romanian banking system is presented in Table 1.

Table 1

Structural indicators of the Romanian banking system

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of credit institutions	40	39	42	43	42	42	41	40	41
Number of majority private-owned credit institutions	38	37	40	41	40	40	39	38	39
Number of majority foreign-owned banks, of which:	30	33	36	37	35	35	34	34	36
- braches of foreign banks	6	7	10	10	10	9	8	8	9
Weight of majority private-owned banks in all assets (%)	94	94.5	94.7	94.6	92.5	92.4	91.6	91.6	92
Weight of foreign-owned banks in all assets (%)	62.2	88.6	88.0	88.2	85.3	85.0	83.0	89.8	90.8
Weight of the first five banks in all assets (%)	58.8	60.3	56.3	54.3	52.4	52.7	54.6	54.7	54
Herfindahl-Hirschman index	1124	1171	1046	926	857	871	878	852	834

Source: NBR

Because of the present economic context characterized by disturbances in the international financial markets and lowering trends of the real GDP at the national level, the financial intermediation level – measured as assets weight in the GDP of the Romanian financial system assets – diminished slightly (as shown in Table 2).

Following the investigation at the financial system level, we notice the prevalent position of the financial banking institutions. Although the private pension funds began to rise in 2008, the level attained shows their low capacity to ensure and maintain the stability of the domestic financial markets (especially through purchases of long-term assets).

Table 2

Structure of the Romanian financial system (assets weight in GDP)

Financial intermediation institutions	Assets weight in GDP (%)							
	2005	2006	2007	2008	2009	2010	2011	2012
Financial banking institutions	45.00	51.00	60.00	61.00	66.00	72.00	70.00	68.00
Insurance companies	2.00	2.50	3.00	3.00	3.50	3.00	2.50	2.50
Private pension funds	0.00	0.00	0.00	0.17	0.47	0.84	1.19	1.00
Financial investment companies	1.77	2.35	2.80	1.20	1.49	1.65	1.30	1.00
Open investment funds	0.17	0.30	0.30	0.20	0.67	1.07	1.23	0.88
Non-banking financial institutions	4.50	4.70	7.20	8.40	7.52	7.00	6.82	6.40
All financial system	53.44	60.85	73.30	73.97	79.64	85.56	83.04	79.78

Source: NBR Annual and Monthly Reports on financial stability http://www.bnr.ro/Publicatii-periodice-204.aspx), Reports on the insurance market (http://www.csa-isc.ro/).
Note: The open investment funds consist of "Fondul Proprietatea". There are no data available for 2005-2007, because the private pension fund was created in 2007.

A relevant indicator of competition in the banking system is the concentration level. Its evolution for the Romanian banking system between 2008 and 2013 is shown in Figure 5.

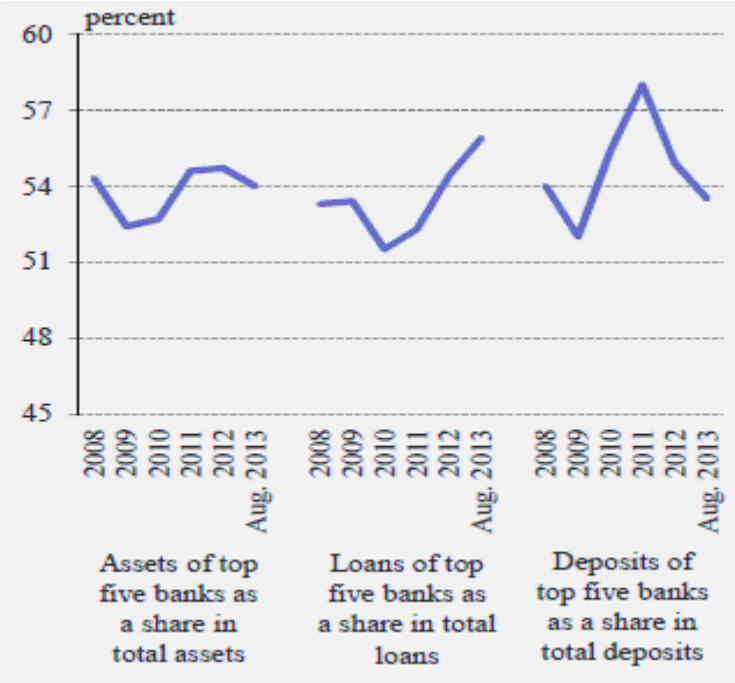
According to the 2013 Report on banking system (*Source: NBR*), as revealed by the weight of the assets held by the first five banks in all assets, it slightly diminished to 54 percent in august 2013.

The Herfindahl-Hirschman index[2] for August 2013 shows a higher concentration of credits (875 points), while the concentration of deposits is 825 points and that of assets reaches 834 points.

According to Figure 6 (asset concentration level – international comparisons); the Herfindahl-Hirschman index places the Romanian banking system below the EU average.

Figure 5

The concentration level of the Romanian banking system

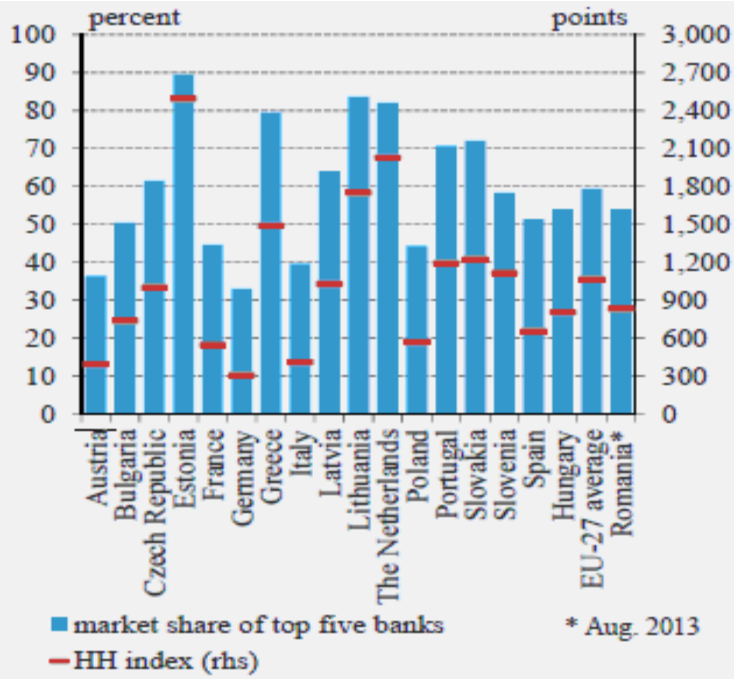


Source: NBR (2013 Report on Financial Stability)

[2] *The Herfindahl-Hirschman index measures the concentration of the bank portfolios. A value below 1000 points indicate a non-concentrated market; between 1000 and 1800 points, the index indicates an average concentration of the banking system and a value over 1800 points indicates a highly concentrated market.*

Figure 6

Asset concentration level (international comparisons)



Source: NBR (2013 Report on Financial Stability)

The concentration of the Romanian banking system, as reflected by the share of the top five banks in total bank assets, declined slightly to 54 percent.

Deposits also followed a similar trend, as in August 2013, the top five banks (in terms of their asset size) accounted for 53.5 percent of the deposits taken.

The relative decline in the banking system's concentration in the first half of 2013 shows the stiffer competition among credit institutions in terms of deposits taken.

3. Conclusions

The main role of the financial intermediation in the efficient assignment of resources in economy is emphasized by the international theory and practice also applicable to the transitory

economy, financial intermediation having an economic mobilization role.

In Romania, the lending is more important for the economic increase because the self-funding capacity of the firms is low, the small and medium sized business sectors are low, and the role played in the financial market by other intermediate is still reduced. For Romania, the financial intermediation is a banking process because banks been holding the great majority of financial assets.

The Romanian banking system, in spite of the rapid development from the passed years, encounters itself in an early stage of financial enlargement as compared to the majority emerging economies.

Specific to Romanian economy the transmission mechanism of the interest rate pass-through is based on transitory measures previously taken over National Bank of Romania in view of credit increase limitation granted to unprotected debtors towards the currency risk and financial stability.

Thus the efficiency of interest rates transmission mechanism has been gradually gained as a bigger financial stability has been achieved.

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ASSESING THE COSTS AND THE CONSEQUENCES OF THE ROMANIAN ECONOMIC CRISIS

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Abstract

This paper analyses the Romanian economic crisis (2009 – 2011) in terms of costs. If it is relatively simple to define the causes of the Romanian crisis, there are few studies that try to determine the actual costs. Each country has its own particularities so it is a general interest to determine the real costs. On the other hand, some of the costs may be exacerbated or distorted The focus of this Paper is to do a roughly estimate of the financial costs for the national crisis. We are aware that any estimation of the costs is going to be incomplete (for instance some of the costs are not yet recognized) and that is why we focus on a range of the likely costs for that the Romanian society gave up. The range is useful for future analysis of the preventive public policies in order to avoid a future crisis.

Keyword: cost of crisis, financial crisis, economic crisis, lost output, Great Recession

JEL Classification: E52, E58, G01, E62

1. Introduction

The economists are eager to find during or after a financial crisis if the policy makers took the right decisions and if they chose the right sets of instruments with a proper magnitude for addressing the turmoil. One way is to analyze the policy mix and the duration of the turbulent times and compare them with past crisis. A different approach is to propose a new set of instruments and by using estimates to figure a different duration or impact on the financial stability. Typically is difficult to assess the costs of the crisis because each indicator will be debatable and that is why most of the studies use the GDP losses (the contraction of the economy) that happened during turbulent times or in terms of bailouts. The 2009-2011

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Romanian crisis was different at least for two reasons. First, while the world was going toward The Great Recession, Romania was building its own balance of payment crisis[1] that could have been triggered by a single shock or by a sum of shocks. Second, it was a very severe financial crisis that followed a historical boom in terms of economic expansion – the crisis of 2009 started to manifest in the third quarter of 2008 after a historical tranquil times (our findings are that in the 34 quarters of the expansion phase for the economic cycle before the crisis there was no recessions and we had just to quarters of negative economic growth (2000, Q3 and 2005, Q1). During such a long time probably the policy makers forgot the cost associated with crisis and that is why we try to estimate these costs, in order to have a tool of prevention in the future: ignoring the signals sent by the economy can be very costly and the social costs of the crisis are able to find a correspondent in terms of money.

2. Conceptual and theoretical context

A sum of factors induced the Romanian economic crisis: from the real estate bubble-burst cycle to lax (pro-cyclical) fiscal policy during the boom years, the accession of Romania into NATO and EU that attracted huge amount of money that were turned into easier borrowing that fueled a boom expansion (2004-2008) while widening the current account deficit to unsustainable levels. In the same time the monetary policy had to fight with still a high inflation (9,2% in 2004) while switched to the inflation-targeting regime. It is not unusual to see in emerging economy that the monetary policy objective (to achieve price stability) might be seen as an obstacle for the fiscal policy makers for whom the political cycle is more important than the economic cycle so they tend to be expansionary. When this view is used on a time frame when the GDP growth faster than its potential, the monetary policy tries to restrict the monetary stance by increasing the interest rate. For an economy that is still underdeveloped, and in a low interest rate global environment, it is easy for the commercial bank to prefer lending in a foreign currency. This limits the capacity of

[1] *As a PhD candidate, in our thesis ''The economic policies mix during a crisis ''(expected in September 2015) we argued that it is wrong to consider the Romanian Crisis just as a consequence of the Great Recession since Romania was developing its own balance of payment crisis before the Great Recession. We are going to use the results we look for in this paper in our Ph.D thesis as well.*

the central banks to restrict credit and adds vulnerabilities to the local banking sector. One of the reasons for a crisis to occur is a sudden stop in capital flows, that will dry money from the economy and finally will conduct to an economic contraction. Studies of the costs of financial crisis typically used output loss as an estimate, for instance Paoli, Hoggarth, Saporta (2009). Blinder (2013) argues that the costs of crisis are related to the speed of reaction. He compares the way Europe and USA acted during the Great Recession. He shows that the US Government was fast in reaction and that help contracting the initial package for helping the economy (the TARP program allocated 4.7% of GDP but finally just 3% of GDP were used, and more, the money were paid back, including interests). Blinder shows that the ad-hoc bailouts program adopted by the European Governments were late and more costly.

In order to estimate the costs that the Romanian society gave up as a consequence of the economic crisis, we will use the following indicators:

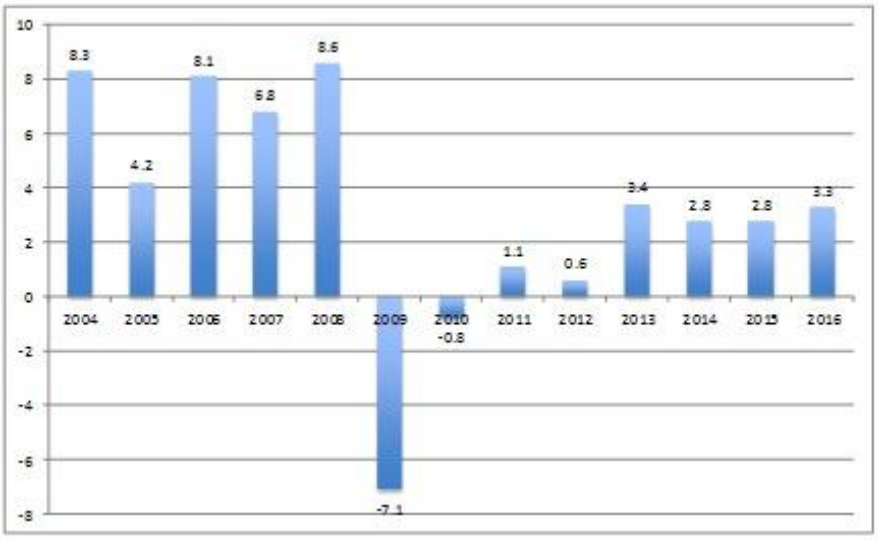
- The cost of lost output: how much does the society pays relative to a baseline trend that might have been in the absence of the crisis (and we define the baseline trend from the pre-crisis period;
- The decrease in the household wealth, as the crisis consume a lot of the net worth of the population;
- The decrease of the financial wealth. We will look at the evolution of non-performing loans (NPL) and also at the lost revenue for the public budget because of the NPLs;
- The losses of the human capital in terms of current wage income. For this, we will use the compensation of the employees as percent of GDP as a proxy for the forgone consumption;
- The losses of human capital in terms of lost jobs – the extended unemployment and reduced opportunities
- The costs associated with VAT and excises increase (the costs with fiscal adjustments);
- The costs with budgetary deficits associated to the crisis and the costs associated with the increase of the public debt (other than public deficit). The costs for financing the supplemental public debt.

3. The size and the time frame for a full boom-bust Business Cycle in Romania

Even if the crisis started to manifest in Romania in the third quarter of 2008 (when the quarterly GDP turned negative, -0.3% growth in Q3 comparing to Q2), the full deployment of the Romanian crisis was felt in 2009 (Soviani, 2014), when the annual GDP fell by 7.1%, continuing in 2010 (-0.8%) and going to 2011 as well. In 2011 the real GDP managed to growth at a annual rate of 1.1%, but we fully include 2011 in the Romanian economic crisis since in the last two quarters (Q3, Q4), the Romanian economy turned back intro recession, with two consecutive negative growth rates (as shown in Figure 2).

Figure 1

Real GDP Growth (%), 2004-2016



Source: AMECO Database, 2015; European Commission estimates for 2015-2016 annual growth

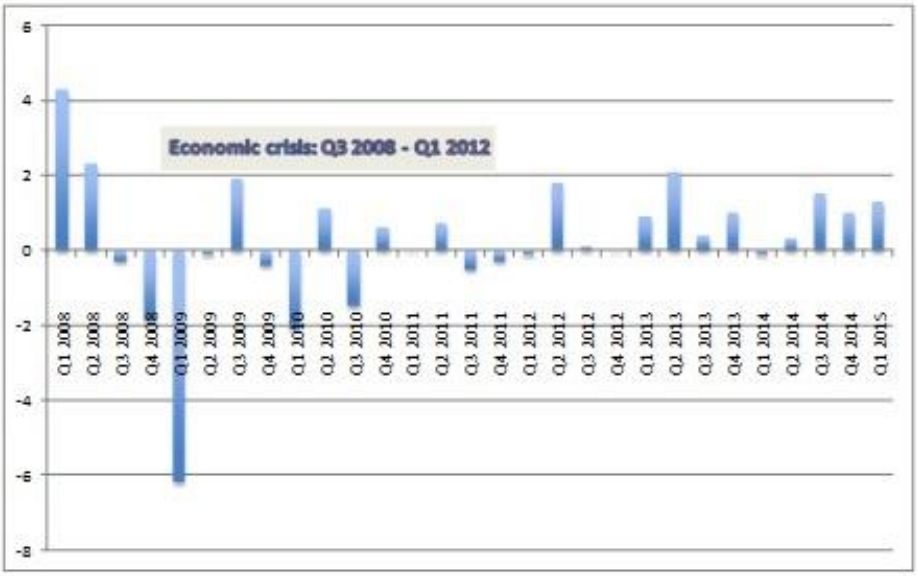
As shown in Figure 2 (Quarterly economic growth, seasonally adjusted data), the quarterly GDP started to decline in Q3 2008 (0.3%), and the last quarter of decline was in Q1 2012 (-0.1%). So, we set as a time frame for the economic crisis this period, which consists of 15 quarters.

As calculated from the data that were used for Figure 2, the average quarterly economic growth in the 15 quarters time horizon (Q3 2008 – Q1 2012) was -0.6%. Q1 2009 showed the maximum decline (-6.2%) while the best quarterly results during this economic crisis was in Q3 2009 (+1.9%).

In terms of lost output, we will further refer at the 2009-2011 yearly data as a base for computing the costs of the Romanian Economic Crisis.

Figure 2

Real GDP growth, quarterly change (%), 2008-2015



Source: Romanian National Institute of Statistics (INSSE)

In order to simplify the time frame on which we estimate the costs of the Romanian economic crisis we will use the yearly data for GDP dynamics and will split the time frame (2004-2015) into 3 intervals as follows:

- 2004-2008 – The pre-crisis. As data are reflected in Figure 1, the average yearly economic growth for the 5 years time frame was 7.2%;
- 2009-2011 – The crisis. As data are reflected in Figure 1, the average yearly economic growth for the 3 years interval was -2.26%;

- 2012-2016 – The after crisis. As data are reflected in Figure 1, the average yearly economic growth for the 5 years time frame is 2.58%. We consider 2016 as the end of the interval since the European Commission; in its Spring 2015 report on Cyclical Adjustments on Budget Balances considers 2016 as the moment of closing the output gap for the Romanian Economy.

4. A simple method to estimate a monetary cost of the Crises for the Romanian Society

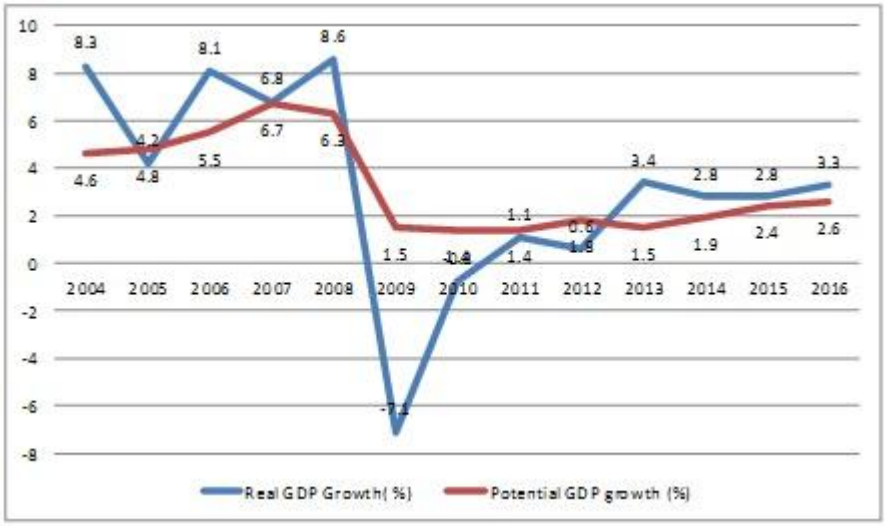
Usually, the economic literature uses the size of the economic contraction or the value of the rescue package for calculating the costs for a financial downturn. In this Paper we want to estimate a more accurate cost by trying to quantify some indicators as costs paid by the society, on the medium and long term.

One characteristic for the Romanian crisis it was that it was not anticipated and even worse, the fiscal policy makers were ignoring a contraction scenario and acted like the expansion of the economy is granted. This lead to expectations for people and companies that was unrealistic. While money were lost by wage cuts, a significant loss occurred by distrusting the policy makers and that was seen in a sharp contraction of the private sector deficit (before the crisis, in 2007, the current account deficit was 80% generated by the private sector while in 2009, it was 100% generated by the gsector, showing a sharp contraction). Even if the people and companies had money, they were afraid to spend. Some fiscal measures that were abruptly taken (like VAT raise and wage cuts) contributed more for a prolonged recession that was seen in a lower GDP for an extended period, greater households wealth decrease, higher and longer unemployment, etc. We summarize the main factors that are quantifiable, in our opinion, and might represent the costs of the crisis.

a) The cost of the lost output. As we concluded that the economic growth pace in the pre-crisis period was higher than the potential GDP, we will use as a baseline trend that might have been in the absence of the crisis the average potential GDP during 2004-2008. The indicators are calculated by the EU Commission and are included in its 2015 Spring Report on Cyclical Adjustment Budget Balances. The trend line can be observed in Figure 3.

Figure 3

Real GDP vs Potential GDP (%), 2004-2016



Source: AMECO Database

As the baseline trend is defined by the average potential GDP growth (2004-2008) respectively 5,58% annual ''potential'' growth instead of the real average GDP growth during this period (7,2%), and while the real average output (-2,26%) in the 3 years period crisis (2009-2011) fell far below its average potential growth for the same period (1,43%) the result for the lost output, just for the 3 years period is:

Lost output = 3 * (5.58 + 2.26) = 23.54% of GDP.

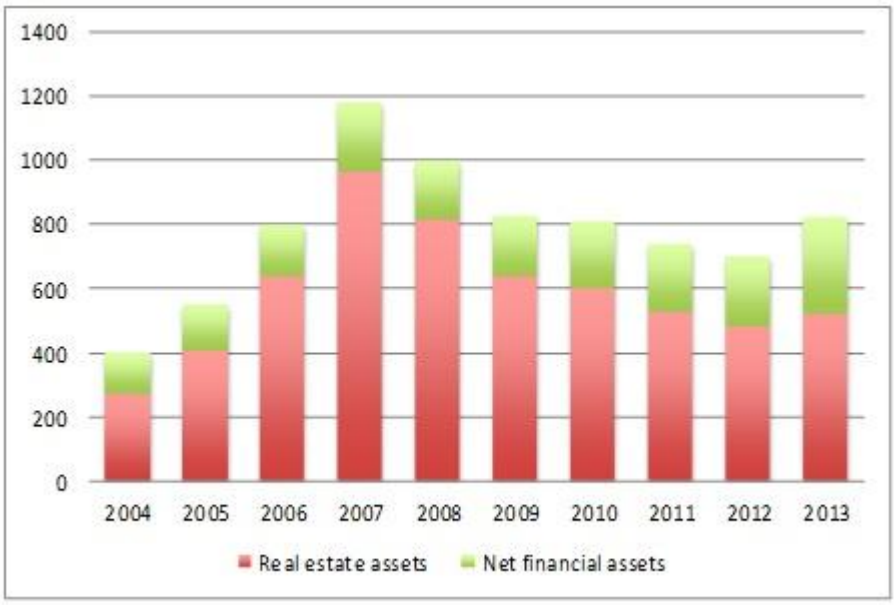
This is a minimum estimation since it doesn't count the real output GAP for 2009, 2010, 2011. In the second instance, the lost GDP would have been 27.81% of GDP. We also count the effects just for 3 years (even if we know that the GDP is affected for much longer).

b) The decrease in the households wealth (which includes Real-estate assets and Net financial assets), as the crisis consumes a lot of the net worth of the population.

According to the data of the National Bank of Romania (Georgescu, 2015), the household wealth decreased from its 2008 level (1,000 billion lei) to 820 billion lei in 2013.

Figure 4

Households wealth, bln. lei, 2004-2013



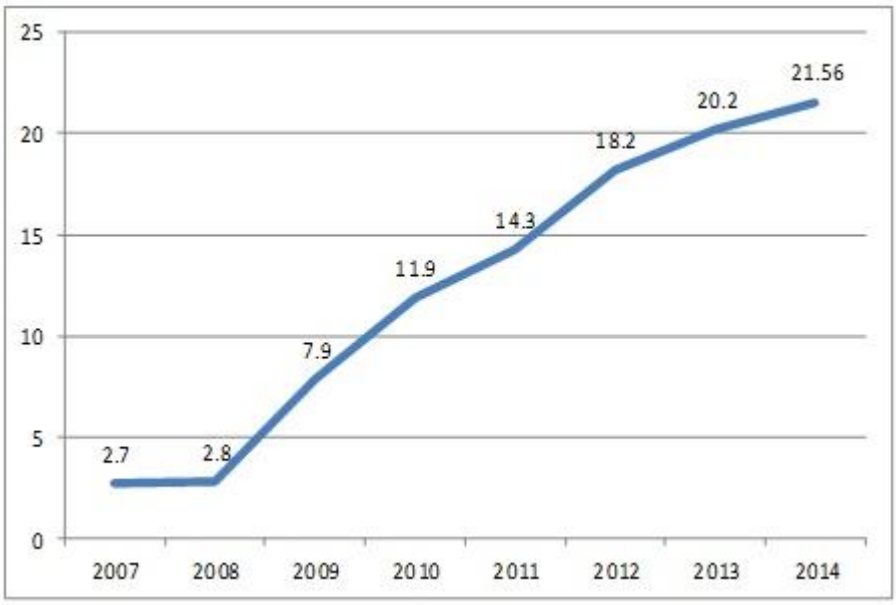
Source: National bank of Romania

The lost amount of 180 billion lei (49 billion Euros at the average EUR/RON exchange rate in 2008 – 3.6827 lei/ Euro) represents 35% of GDP, which we assume that is cost related to the decrease in the households assets. In time, some of this cost will be diminishing, but we take into consideration this figure 35% of GDP (for a GDP of 140 billion Euros in 2008) as an indictor for the decrease in the household's wealth. On the upper side, the diminishing of the household wealth from the peak in 2007 to 2013 was even larger, 95 billion Euros (or 67% of the 2008 GDP).

c) the decrease of the financial wealth. The evolution of the non-performing loans (NPL) is described in Figure 5 and we'll add to the cost of the crisis the lost revenue for the public budget because of the NPLs (as equivalent of the income tax applied on the stock of the NPLs).

Figure 5

Non-performing loans rate, as % of total loans



Source: National Bank of Romania

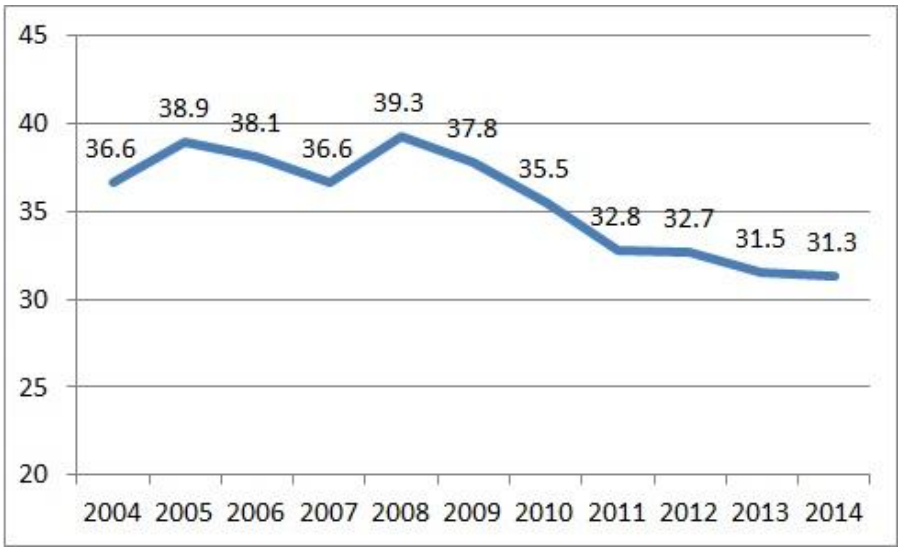
As we see, the NPL rate grew dramatically from 2.8% in 2008 to 21.56% in September 2014. The raise of 18.76 percentage points represents 40 billion lei (the rate is applied at the loans stock in September 2014), or about 10.86 billion Euros (at the average 2008 EURRON exchange rate). We will quantify as lost public revenue the result of the income tax (16%) on the NPL stock, since the NPLs diminish the profitability of the banks. **As a result we have a bill of 1,73 billion Euros on the public budget or 1.24% of GDP (2008).**

d) The losses of the human capital in terms of current wage income. For this, we will use the compensation of the employees as percent of GDP as a proxy for the forgone consumption.

As we see in Figure 6, the compensation of employees (as percentage of GDP) fell dramatically from 2008 to 2014 (from 39.3 of GDP to 31.3% of GDP), diminishing its share by 8 percentage points. We take now into consideration just the loss in terms of current wages income from 2009-2011.

Figure 6

Compensation of employees (% of GDP)



Source: AMECO

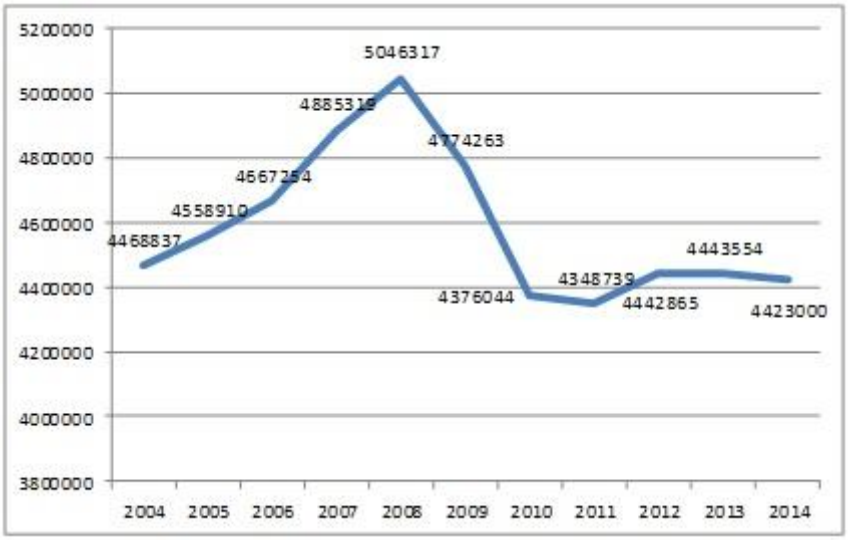
The Romanian economy's wage bill, on average, was 37.9% of GDP between 2004-2008, and 35.4% of GDP, on average, during the crisis (2009-2011). As we said, we do not assume as cost the further lost of share (till 2014) as we do a minimum estimate of the losses of the human capital in terms of compensations of employees. For the 2009-2011, the annual cost associated with the decrease of the average share of GDP is 2.5% of GDP, **with a total of 7.5% of GDP for the whole period, as estimation for the forgone consumption.** The average compensation of employees between 2009-2014 was 32.76%, so, on the upper side, we are able to estimate a broader number of 15.84 % of GDP (2009-2014).

e) The losses of human capital in terms of lost jobs – the extended unemployment and reduced opportunities.

As the crisis unfolded, the economy started to lose jobs. The maximum number of employees in Romania in 2004-2014 was registered in 2008 (5.04 million employees) while the minimum was reached at the end of 2011 (4.34 million employees). So, during the crisis, the economy lost about 700.000 jobs, as showed in Figure 7, 351.000 jobs being definitively lost.

Figure 7

Average number of employees



Source: AMECO

So the economy lost during the crisis (2009-2011) a total of 4.28 billion Euros (3.06% of 2008 GDP), as follows:

- 2009: 272.054 jobs (GDP/capita 2009: 5.912 EUR), total GDP lost: 1.6 billion Euros;
- 2010: 398.219 jobs (GDP/capita 2010: 6.260 EUR), total GDP lost: 2.49 billion Euros;
- 2011: 27.305 jobs (GDP/capita 2011: 6.616 EUR), total GDP lost: 0.180 billion Euros;

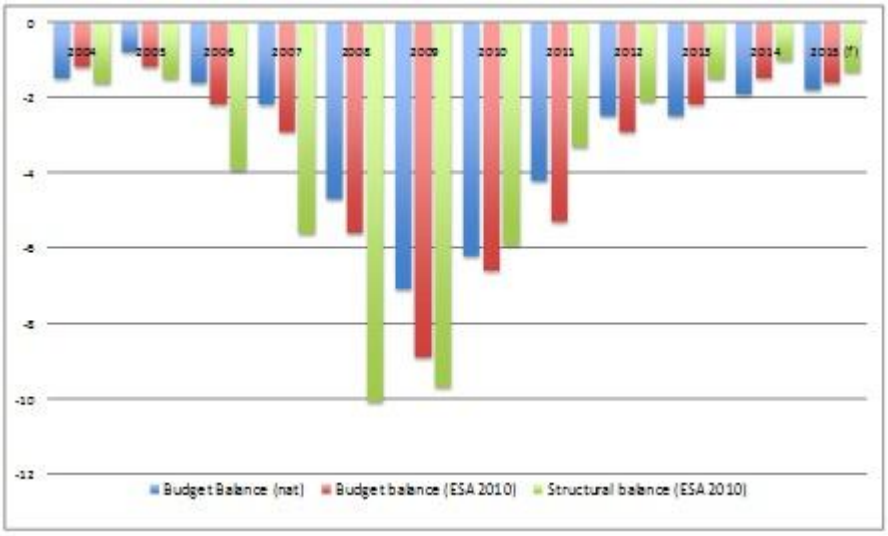
The 3.06% of GDP loss because of jobs is a minimum estimate as we calculated the GDP loss each year using just the jobs that were effectively lost that year and not modeling the financial costs of the long term unemployment (including unemployment benefit, permanent GDP loss for the long term unemployed). On the upper side, considering that the 351.000 jobs that were lost we have an additional 7.41 billion Euros further impact in 2012-2014, or 5.36% of GDP as additional losses.

f) The costs associated with VAT and excises increase (the costs with fiscal adjustments).

During the pre-crisis interval (2004-2008), the fiscal policy was pro-cyclical, so when the crisis unfolded there was a need for fixing the budgetary disequilibrium, especially because the high rate of growing of the budgetary expenses (including interests payments). As we see in figure 8, the budget balance in 2009 (ESA 2010) reached 8.9% of GDP (hiking from 5.6% of GDP in 2008).

Figure 8

Budget balances (national methodology, ESA 2010, structural Balance)



Source: AMECO

While we will consolidate the raise and the quantum of the yearly budget deficit **as the next cost (related to the raise of public debt), we quantify as costs of budgetary measures in order to fix the budget balance, measures like the VAT raise (from 19% to 24%), public servants wages cuts (-25%), excises raise. This set of measures reflects into to budget as ''fiscal consolidation''.**

Between 2009 and 2011, the budget deficit went from 8.9% of GDP to 5.6% of GDP. We consider as **costs for the fiscal adjustments during the crisis** the 3.6% of GDP decrease of the public deficit (the amount of fiscal consolidation). On the upper side, if we take into account the budget deficit curve between 2009-2014, the result is 7.2% of GDP.

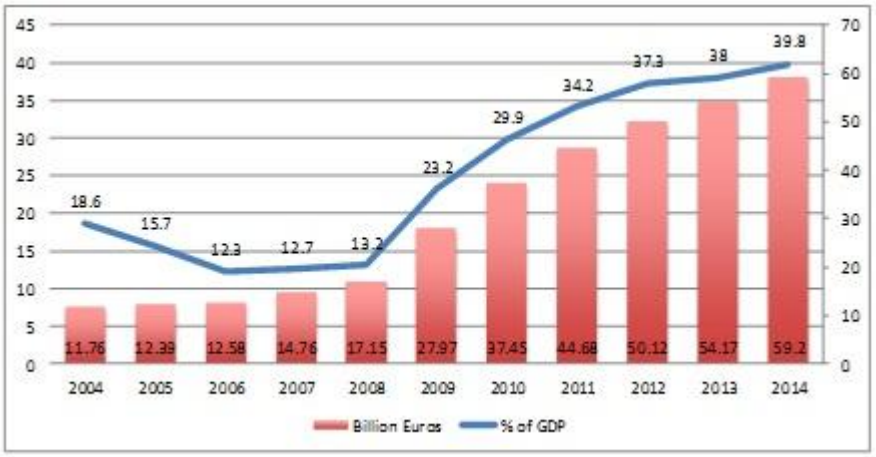
g) The costs with budgetary deficits associated to the crisis and the costs associated with the increase of the public debt (other than public deficit).

As Figure 9 shows (General Government Gross Debt) shows, the public debt stood at 13.2% of GDP in 2008 (the average for 2004-2008 was 14.5% of GDP.

During the crisis (2009-2011), the public debt mounted from 13.2% of GDP to 34.2% of GDP (almost triple). In nominal terms, the public debt raised from 17.15 billion Euros to 44.68 billion Euros (27.53 billion Euros or **20% of 2008 GDP**).

Figure 9

Public debt - General Government Gross Debt, %GDP, 2004-2014



Source: AMECO

The public debt raised even further, reaching 39.8% of GDP in 2014 (four times higher than the 2008 level) with a correspondent nominal value of 59.2 billion Euros (+42 billion Euros, +244.9% comparing with the 2008 level and a quota of 30% of the 2008 GDP).

Since we follow the public debt dynamics in terms of costs just for 2009-2011, we will take into account the 20 percent share compared with the 2008 GDP as a direct effect of the crisis on public debt . According to this, we estimate the impact is **at least** 20% of GDP.

4. The estimation of the minimum costs for the Romanian economic crisis

As a result of the calculations done above, we are able to estimate de minimum costs of the Romanian economic crisis (2009-2011), as a share of GDP. We acknowledge that results could be even higher because the policy mix implemented during and after the crisis generate additional and lasts for many years.

Table 1

The costs of the Romanian economic crisis

The Costs	**Minimum level (% of GDP)**	**Maximum level (% of GDP)**
The lost output	23.54	27.81
Decrease in households wealth	35	67
Non performing loans	1.24	1.24
Losses of the human capital (wages)	7.5	15.84
Losses of the human capital (jobs)	3.06	8.42
The costs with fiscal adjustments	3.6	7.2
The costs with public debt	20	30
TOTAL COSTS:	**93.94**	**141.67**
Total costs (nominal, 2008 GDP, bln Euros)	**131.51**	**198.33**
Total costs/capita (Euros)	**6,575.5**	**9,916.9**

5. Conclusions on the assessment of the costs and the consequences of the Romanian economic crisis

An exact assessment of the costs of the Romanian economic crisis is hard to be made because of the strong correlations between indicators and the way they reacted on other policies that were implemented after the crisis. We are still able to do some estimates, in a range minimum-maximum, that goes from 93.94 percent of 2008 output to 141.67 percent of 2008 output.

Usually the costs of a crisis are associated with the lost output. We found out in our research that the costs associated with the human capital (in terms of jobs and wages) might be equal with

the lost output on the medium term, and as high as half of the lost output on the short term (the conservative estimate).

We also found out that the correction of the wage bill (compensation of employees) was much sharper than the its expansion which is a tough lesson both for consumers (that use to draw long term plans based on short-term reality) and both for policy makers, who should understand that additional revenues to the state budget from a higher wage bill will turn sharp negative during a correction prompted by a recession. We found out that during the growth period in Romania (2004-2008), the average value of the compensation of employees grew by an average of 0.82/year, while the correction was 1.15 GDP points/year that shows a correction factor 40% higher than the expansion factor.

Usually, in terms of NPLs, economists are approaching just the shareholders losses. We stressed out that the NPLs, besides social costs in terms of present losses and future credit restrictions for the debtors might have an impact as high as the whole public deficit for a year, in tranquil times (in terms of profit revenues loss to the public budget.

Blinder (2010) that a fiscal stimulus might be successful and it was successful during the Great Recession in helping to end it and by accelerating the recovery. We found out that a fiscal stimulus was not possible in Romania (since a fiscal stimulus of about 12% of 2005 year GDP was pumped into the economy between 2005-2008 in a pro-cyclical approach of the fiscal policy and that is why, when the stimulus was needed (2009) the public budget had no room for stimulating the economy and also the policies acted pro-cyclical on while the economy was contracting, taking money out from the market). While this helped a lower cost of the fiscal consolidation it also influenced a higher cost in term of jobs that were lost.

Finally we hope that by using the result of the research (and as far as we know this is the first research about the Romanian crisis in terms of costs that quantifies not just the public debt and the output lost), the policy makers and other researchers will have the opportunity to have a broader view of the costs for ignoring a crisis before it unfolds.

The results we found are in line with some estimates for a different economy (Lutrell, Atkinson and Rosenblum, 2013a). For instance the crisis costs in the US economy in terms of 2007 GDP share is between 40% - 90% according to the path of output and

between 100%-190% (Lutrell, Atkinson and Rosenblum, 2013b) according to the path of consumption.

We prefer to set as result for this paper the conservative estimated costs of the Romanian economic crisis the 93.94% of 2008 GDP, respectively a cost/capita of 6,575.5 Euros since some consequences are hard to quantify (for instance the impact of extended unemployment or permanently loss of jobs.

The costs are even higher but we are not able to quantify the impact of distrusting the economy (and significant lost of trust in government institutions and the adverse psychological costs. By the results we found, we hope to offer a first reference in terms of costs for the Romanian financial crisis.

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POSITION OF THE ROMANIAN TAX SYSTEM WITHIN THE TYPOLOGY OF TAX SYSTEMS

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Abstract

In this paper we propose to achieve a theoretical classification of tax systems based on theories and literature in this field, highlighting the specific characteristics of each type of tax system. Based on the typology performed, the evaluation of the Romanian fiscal system and its positioning within the typology of tax systems will be studied, with the presentation of results relevant to the stages of economic development and the changes in the structure of the tax system that generated its typological transit. We appreciate the fact that the work developed on two classification levels, one fundamentally theoretical and one practical, will be a useful tax guide, with the presentation of the fundamental characteristics of the fiscal systems and the assessment of government options in selecting the type of tax system implemented.

Keywords: tax system typology, fiscal criteria, economic transition

JEL Classification: H, H5, E62, E63

1. Introduction

The fiscal policy, by the government revenue and expenditure strategies that influence the macroeconomic conditions , provide the regulatory authorities with macroeconomic adjustment mechanisms for achieving the aims of improving the unemployment rates, the inflation, of stabilizing the expansion of economic cycles and interest rates, in an ongoing effort to control and adjust a country's economic trajectory and / or to adapt to the international treaties and regulations which they complied to.

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In its action to influence the economic performance, the fiscal policy uses the tax system as the main instrument. It is a set of tax rules and norms that form, from a structural and functional point of view, a unit with its own personality and characteristics, flexible and adaptable to the goals and aims of the fiscal policy.

These features of flexibility and adaptability led in time to the shaping and conceptualization of a certain typology of tax systems, generated by a theoretical and practical necessity of achieving an organized and coordinated link, in a rational and feasible manner of implementation, between the government strategies and the real economy.

Thus, the theory of public finance provides classifications of tax systems according to several criteria. The national approaches that combine the theoretical approach with the empirical one, by which to achieve a positioning of the Romanian fiscal system following the criteria and typologies of tax systems, provide, at this time, space for maximized attention and development. In this context, we consider that the work can be, besides the issues mentioned in the summary, a wider approach on the subject that can capture the attention and concern of the scientific community. In terms of methodology, the logical analysis, the explanation of phenomena, the classification and theoretical elements interaction with the practical realities will be used in the development of the work.

2. Typologies of tax systems

As noted, the tax system is the main instrument through which the fiscal policy operates based on the purpose and aims pursued, inducing structural changes on it.

The literature provides several classification criteria (Buchanan, James, and Musgrave, 1999; Dinga, coord., 2011), more or less relevant. We appreciate as relevant and sufficient to achieve the aim of the work, four criteria for the classification of the tax system, namely: the technical criterion; the economic criterion; the structural criterion and the criterion of the intensity of the fiscal pressure.

a) The technical criterion refers to:

- the theme of the single tax, assumes a single tax base that would allow to increase the tax burden and to avoid tax evasion. The manifestation of such a tax system would amplify the effect on

the degree of economic inequality and prevent, from the social point of view, the tax customizing to each taxpayer's capability to pay tax;

- the theme of direct vs indirect tax predominance involves the authorities' option for one of the two types of taxation, namely prevailing taxation of income or prevailing taxation of consumption. The differences between the two types of taxation generally consists in the following:
  - affordability, where the direct tax is on the person who receives the income, with immediate withholding on receiving, while in the case of the indirect tax the affordability is transferred to a third party, usually the final consumer;
  - customizing of direct tax is apt at individualisation/ personalization depending on the social status of the taxpayer, while indirect tax cannot be customized;
  - changes in yields, both in terms of economic resilience and the statutory tax rate changes, the direct tax presents a relatively stable yield, while the indirect tax yield is fluctuating.

b) The economic criterion shows that the tax system, beyond the legal and technical aspects, are also dependent on the economic conditions under which they are are implemented. It influences the distribution and redistribution through taxation, the development and fiscal efficiency. In economics four evolutionary stages have been outlined, in terms of economic development, which account for a certain typology of tax systems. In general, in the underdevelopment stage and in the developing (cruise) one, revenues are reduced, in which situation indirect taxation is prevailing and the tax burden is relatively low, the opposite situation being recorded in the developed and highly developed countries.

c) The structural criterion corresponds to the possibilities of amending the tax system through the characteristics of the statutory rate. Under this criterion four distinct types of tax system can exist, namely:

- the progressive tax system involves the application of the principle of tax rate differentiation directly proportional with the ability to pay, it has an anti-cyclical nature, being considered the only automatic fiscal stabilizer and performed by tax equity;
- the regressive tax system involves the application of the principle of differentiated tax rate inversely proportional to the ability to pay and is highly cyclical;

- the proportional tax system involves the principle of taxation with linear proportional share being characterized by the marginal tax constant value;
- the flat-rate tax system involves the establishment of fixed quanta payable by legal persons , irrespective of their balance sheet. An important feature of it is that it taxes a non-transparent base and reduces the black economy.

d) The criterion of fiscal pressure intensity classifies the tax systems into:

- hard tax systems, characteristic especially of economically developed countries , where the contribution of public capital in the economy is reduced , but also in former communist countries, characterized by low efficiency of the economy, administrative transition and the need for substantial public funds to achieve reforms. A tax system can be considered heavy if simultaneously the share of fiscal revenue in the total budget is more than 80-90% and the tax levies in GDP is over 25-30%;
- light tax systems, characteristic of underdeveloped countries or in transition, in which the share of fiscal absorption from the GDP is lower , about 10-15%, and the individual tax burden depends on the level of GDP and the distribution of income among the participants in its realization.

3. Romanian fiscal system assessment in relation to the types exposed

The Romanian economy transition from a centralized system to a functioning market economy, the sequence of accession and European integration, the regional tax competition to attract foreign capital and permanent preoccupation of governments to ensure and increase tax revenues made the tax system a highly important anchor in achieving these goals. In order to ensure the convergence with these processes and objectives, which are sometimes overlapping, changes were made to the tax system, which were transposed, in fact, into frequent amendments to the Tax Code and the Tax Procedure.

In this economic and institutional framework, dynamic and emergent, the tax system went through several stages, which we will try to evaluate and make fit the criteria set to achieve a certain portrait of the Romanian fiscal system. We appreciate relevant to our

evaluation and results, two stages, namely: the period 1990-2004 and the period from 2005 to 2014.

Characteristics of the tax system during 1990-2004

The main characteristics of the tax system implemented by the government authorities during the period 1990-2004 were: the progressivity of taxation that ensures a mechanism for automatic stabilization of the tax system; redistributivity of the income through taxes and an important social component.

In terms of technical criterion, the progressive tax system applied in the period 1990-2004 was characterized by the predominance of the direct tax at the level of the statutory tax rate, which enabled its customization and adaptation according to the social status of the taxpayer. Over the period analyzed, the share of tax revenues generated by direct taxation, both in total tax revenues and in the GDP was permanently higher than the tax revenues generated by direct taxation, estimating, in terms of the amount of revenues generated, that the indirect taxation was predominant, while, in terms of statutory tax rate, the direct taxation was dominant (progressive rates between 18 and 40%) compared to indirect taxation that ranged from 18% between 1993-1998, to 22%, in 1998 and 1999 and 19% between 2000-2004.

In terms of economic criterion, which implies the adjustment of the tax system at the stage of economic development, the progressive tax system applied in the period 1990-2004 was suitable for the development of the Romanian economy status (cruise status), ensuring the fiscal equity, the balanced distribution and redistribution through taxation and a progressive, non-accelerated, economic development.

From the point of view of structural criterion, corresponding to the possibilities of amending the tax system by the characteristics of the statutory rate, the tax system in the period 1990-2004 corresponds to the progressive tax system, which gives it a strong anti-cyclical character, being considered the only automatic fiscal stabilizer. In terms of structural effects on the income, this tax system reinforces the incomes of the categories of taxpayers with low and middle income and lays stress on high income taxation, with some social shades.

In terms of the criterion of fiscal pressure intensity, the tax system in the period 1990-2004 has the characteristics of a hard tax

system, specific to the level of development of the country at that time and the transition from a centralized economy to a market economy, when substantial public funds are required for reforms. At the start of the period, the early 90's, the tax share to the GDP was over 40%, decreasing gradually towards the end to about 30%.

Characteristics of the fiscal system in the period 2005-2014

The main characteristics of the tax system implemented by the government authorities during the period 2005-2014 were: to encourage large businesses ; to stimulate consumption; to stimulate foreign investment; to reduce tax evasion by tax relaxation and a sustainable overall economic growth.

In terms of the technical criterion, the tax system with a flat tax on the incomes of individuals and businesses applied during 2005-2014 was characterized by the predominance of indirect taxes, both as statutory tax rate level and tax revenues generated both in total tax revenues and GDP.

In terms of the economic criterion, which implies the adjustment of the tax system at the stage of economic development, it was considered that the progressive tax system has achieved certain goals, bringing the economy to a state that requires a large fiscal stimulus, ie a flat tax revenue. The effects of the tax reform manifested rapidly in the economy, particularly by increasing foreign investment in the economy, a high economic growth, especially in the period 2005 - 2008, an expansion of the business conducted by financially strong companies, but at budget level, the growth of tax revenue ratio to the GDP has not occurred.

From the point of view of the structural criterion, corresponding to the possibilities of amending the tax system by the characteristics of the statutory rate, the tax system in the period 2005-2014 corresponds to the proportional tax system, which confers it a pro-cyclical character. In terms of structural effects on revenue, this high income tax system reinforces and lays stress on small income taxation, with liberal shades.

In terms of the criterion of the fiscal pressure intensity, the tax system in the period 2005-2014 has the characteristics of a hard tax system with fiscal pressure relaxation trends, from around 30% in 2005 to around 28% in 2014.

4. A "portrait" of the Romanian general tax system resulting from its assessment against the criteria set

From the analysis of relevant characteristics of the two successive stages of the Romanian fiscal system, it can be drawn some conclusions, that are presented below, in the tabular form.

No. crt.	Classification criteria	1990-2004 Stage Progressive tax system	2005-2014 Stage Proportional tax system	General characteristics
1.	Technical	*The predominance of direct taxation from the legal share of taxation point of view and the predominance of indirect taxation in terms of generated tax revenues.*	*The predominance of indirect tax, both as tax statutory rate level and generated tax revenues.*	*Alternation of applied tax systems typologies, progressive vs proportional, ensured the specific tax equity, provided an economy's structure converging with its development needs and of compliance with some international agreements it adhered to.*
2.	Economic	*Good adaptability to the Romanian economy development stage*	*It consituted a suitable tax incentive for the real economy.*	*The high tax pressure has mitigated, inversely proportional to the Romanian economy development stages, being, in fact, the economic development impulse.*
3.	Structural	*Tax rates progressivity constituted an automatic fiscal stabilizer that has shaped economic expansion cycle and ensured equity in taxation.*	*Proportionality of tax rate changes the tax system character orientation towards pro-cyclicality and ensures equity to taxation.*	*Alternation of applied tax systems typologies, progressive vs proportional, ensured the specific tax equity, provided an economy's structure converging with its development needs and of compliance with some international agreements it adhered to.*

No. crt.	Classification criteria	1990-2004 Stage Progressive tax system	2005-2014 Stage Proportional tax system	General characteristics
4.	Tax burden intensity	*High tax pressure (40%), with a relaxation trend (30%).*	*Relatively high tax pressure (30%), with a tendency to relax (28%).*	*The high tax pressure has mitigated, inversely proportional to the Romanian economy development stages, being, in fact, the economic development impulse.*

Source: based on the assessment conducted by the author.

It notes that the fiscal policy was oriented towards supporting economic development, adapting sequentially by changing tax system, its stages of development by maintaining a certain tax sovereignty, but at the same time, has adapted and needs tax harmonization, in particular on indirect tax side.

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A PANEL DATA ANALYSIS OF MACROECONOMIC DETERMINANTS OF CORPORATE BIRTHS IN THE EU MEMBER STATES DURING 2004-2012

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Abstract

This article's goal is to analyze the relationship between macroeconomic determinants and the new business entries for 24 EU member states through a Panel Data Analysis during 2004-2012 in order to establish the impact of the tax and monetary policy adopted by the EU member states governments on the business births. The new business density is the dependent variable in a model with five independent macroeconomic variables such as the tax revenue, inflation, the GDP per capita growth, long-term unemployment and the intern credit to private sector by banks.

Keywords: start-ups, econometrics, tax policy, monetary policy, EU

JEL Classification: E24, E52, E62, H25, O23

1. Introduction

The main purpose of this article is to give more empirical evidence to the measurement of business entries determinants, with special reference to the EU countries.

The creation of new enterprises is quite important to a healthy economy because they are involved in innovations, they provide new jobs and they bring economic growth. New companies originate a competitive environment where production costs are diminished.

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New firms play an important role in generating jobs, new ideas and encouraging entrepreneurial activity, and they make an important contribution to the well-being of nations. (Salman et al., 2013)

Braunerhjelm (2007) has shown that promoting new firms can create long-run benefits for the economy and society. (Braunerhjelm 2007).

In EU countries, the positive effects of the birth of new firms received beneficial assessment in the recent economic crisis 2009. A policy of promoting new firms had been in effect in EU countries since the 1980s. The change in the law characterized the forming of new firms positively as a spring of economic vigor and employment and stated that it was governments' responsibility to offer the necessary support to promote the start-ups.

The aim of this paper is to establish the relationship between macroeconomic variables such as the tax revenue (% of GDP), inflation, long-term unemployment (% of total unemployment), intern credit to private sector given by banks (% of GDP) and the GDP per capita growth (annual %) on one side and the new business density on the other side in the European Union through panel data analysis.

The paper is organized as follows: the second part presents the prior literature review concerning business entries at macroeconomic level, the third part the methodology and data used, the research design, the fourth part presents the data panel model; the fifth section analyzes the main results and the last one presents the main conclusions.

2. A review of prior literature

The variables and the model were selected according to the literature review.

An important element of the relation between unemployment and self-employment is captured by the recession-push hypothesis which states that in times of increased unemployment people are pushed into self-employment for shortage of alternative sources of revenue such as paid employment. The authors employ a vector error correction model (VECM) (Congregado et al. 2012).

Unemployment was considered to be the main engine of start-ups creation in the 80s, but nowadays it is the new technology that is the engine. Variations in the firm birth rates are explained by regional differences in industry intensity, income growth and population

growth. The authors find a little support for a positive impact of unemployment on new firm formation rates.(Armington and Acs, 2002).

According to Salman 2013, the corporate births are positively related to the growth of GDP, inflation, and openness and are negatively related to unemployment. The authors employ the random-effects negative binomial regression model (RENBM) to test the relationship between macroeconomic factors and the birth of new firms (Salman et al., 2013).

Mathur (2009) employs spatial econometrics techniques to estimate the impact of bankruptcy regulation on small firm formation. The author discovered that the predicted probability of starting a business is 25% higher in countries with higher bankruptcy exonerations than their neighbors relative to countries with lower exemptions than their neighbors.

According to Atawodi and Ojeka (2012) firms should be levied lower amounts of taxes in order to have enough money for other activities that will lead to business growth and the government should raise tax incentives and exemptions as this will attract investors who are potential tax payers.

Djankov et. al. (2010) demonstrate that high tax rates determine lower business activity. The highest marginal tax rates are usually relevant to the largest firms that could create an opportunity for small companies operating at lower tax rates, which would give them a reduced after-tax cost of capital. The authors employ a data panel approach.

Aghion, Fally and Scarpetta (2007) discover that private credit (proxy for the degree of financial development) is important for promoting entry of new firms. They employ a difference-in-difference approach.

Friedman and Hall (2014) consider that the availability of capital, favorable interest rates, and attraction of foreign investments enhance the private sector activity.

Vliamos and Tzeremes (2012) establish three different factors that appear to have a dominant influence on the entrepreneurial process. By using nonparametric techniques, their article establishes three diverse factors that appear to have a dominant impact on the entrepreneurial process. The first determinant is related to entrepreneurial skills, education, and prior experience because the second factor relates to issues regarded desire of independence and

locus of control. The third determinant, which influences the entrepreneurial activity, is related to social aspects, access to capital and regions' institutional environment.

3. Methodology and data

3.1. Data collection

For our analysis, we have used the annual time series of 24 EU member states, except for Estonia, Slovakia, Cyprus and Malta and the dependent variable was the new business density (new registrations per 1,000 people ages 15-64) during 2004-2012. The database was created with the help of the data from the World DataBank site (The World Bank, 2015) and Eurostat official site (Eurostat, 2015). The macroeconomic variables were selected based on the literature review and taking into consideration the global economic environment.

We have identified transformations to perform on the raw data on the basis of model specification such as transforming the countries names into numbers from 1 to 24 in the alphabetical order.

The fiscal policy was quantified by the tax rate, the monetary policy was assessed through the intern credit to private sector by banks (% of GDP) and the inflation, GDP deflator (annual %) and we also employed a sociometric variable such as long-term unemployment (% of total unemployment).

The dependent variable selected for the analysis is the new business density that is expressed as new registrations per 1,000 people ages 15-64 (World DataBank) during 2004-2012 for 24 EU member states.

The explanatory variables employed in our analysis are the following: tax revenue (% of GDP), inflation, the GDP per capita growth (annual %), long-term unemployment (% of total unemployment) and the intern credit to private sector by banks (% of GDP).

3.2. Methodology

This article’s goal is to analyze the relationship between macroeconomic determinants and the observed new business entries for 24 European Union member states through a Panel Data Analysis. We performed a Fixed Effects model and a Random Effects model that use annual data during 2004-2012 in order to establish the impact of the tax and monetary policy adopted by the EU member

states governments after and before the financial crisis on the business births. Estonia and Slovakia were dropped from our study because of lack of data and Cyprus and Malta were also discarded because they were considered outliers.

The data was collected from the World DataBank site, and Eurostat official site and the econometric model was performed in the Gretl software. The new business density (new registrations per 1,000 people ages 15-64) is the dependent variable in a panel data model with five independent macroeconomic variables such as the tax revenue (% of GDP), inflation, the GDP per capita growth (annual %), long-term unemployment (% of total unemployment) and the intern credit to private sector by banks (% of GDP).

4. Descriptive statistics and exploratory data analysis

From the summary statistics of the raw data we observe that the mean for the variable new business density for all the 24 countries during 2004-2012 is 3.93, for the tax rate is 19.68%, for the inflation rate 2.86%, for the credit rate 106.34%, unemployment rate 39.10% and for the GDP per capita growth 1.5%.

Regarding the Within Standard Deviation, it is greater than the Between Standard Deviation for the variables Inflation rate and GDP per capita growth, i.e. the variation between the countries is greater than the variation across time for these variables.

For the variables new business density, tax rate, credit rate and the unemployment rate the variation is higher across time than across countries.

Summary Statistics, using the observations 1:1 - 24:9.

Table 1

Summary statistics of the raw data

Variable	Newbs	Tax	Infl	Credit	Unempl	GDP
Mean	3.93	19.68	2.86	106.34	39.10	1.50
Median	3.52	20.09	2.26	95.62	42.40	1.76
Minimum	0.33	7.08	-3.92	15.61	9.50	-16.59
Maximum	12.22	34.88	20.30	224.05	64.60	13.27
Std. Dev.	2.45	4.96	3.02	52.81	13.32	4.23
C.V.	0.62	0.25	1.06	0.50	0.34	2.83
Skewness	0.86	0.21	2.25	0.49	-0.27	-0.57

Variable	Newbs	Tax	Infl	Credit	Unempl	GDP
Ex. kurtosis	0.62	0.68	8.04	-0.85	-1.05	2.01
5% Perc.	0.57	11.16	-0.23	34.72	16.53	-6.06
95% Perc.	8.93	26.59	9.60	201.01	58.65	9.13
IQ range	2.81	5.04	2.32	83.44	22.80	4.08
Within s.d.	1.02	1.32	2.36	16.91	6.86	4.10
Between s.d.	2.29	4.89	2.08	51.30	11.86	1.74

Source: Own calculations in Gretl

From the correlation matrix for the raw data we notice that the new business density variable is positively correlated with the tax rate, inflation rate, credit rate and GDP per capita growth and negatively correlated with the unemployment rate.

The correlation coefficient between the new business density and the tax rate is 32%, between the dependent variable and the inflation rate 30%, between the unemployment rate and the new business density -16%.

Table 2

Correlation matrix for the raw data

Newbs	Tax	Infl	Credit	Unempl	GDP	
1	0.32	0.30	0.29	-0.16	0.10	**Newbs**
	1	-0.10	0.41	-0.30	-0.13	**Tax**
		1	-0.37	0.13	0.53	**Infl**
			1	-0.47	-0.38	**Credit**
				1	0.26	**Unempl**
					1	**GDP**

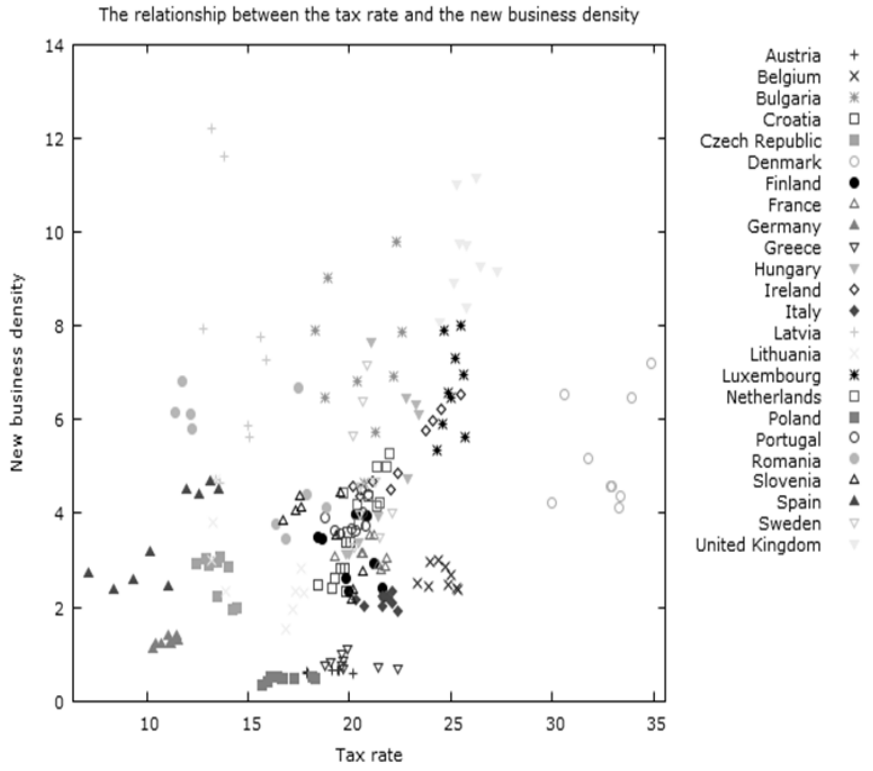
Source: Own calculations in Gretl

Correlation coefficients, using the observations 1:1 - 24:9
5% critical value (two-tailed) = 0.1335 for n = 216

The scatterplot below illustrates the relationship between the tax rate and the new business density of the 24 EU member states. The connection is significant taking into consideration that the correlation coefficient is 32%.

Figure 1

The relationship between the tax rate and the new business density factorized by countries



Source: Own calculation in Gretl

From the factorized boxplot of the new business density in function of country code during 2004-2012 we notice that we encounter the highest mean of new business density in the United Kingdom and the highest variation in Latvia. The lowest mean of the new business density is found in Poland and the lowest variation in Austria.

The factorized boxplot of the tax rate in function of country code during 2004-2012 illustrates that the highest mean of tax rate we encounter in Denmark and the highest variation in Romania. The lowest mean of the tax rate is found in Spain and the lowest variation in Germany.

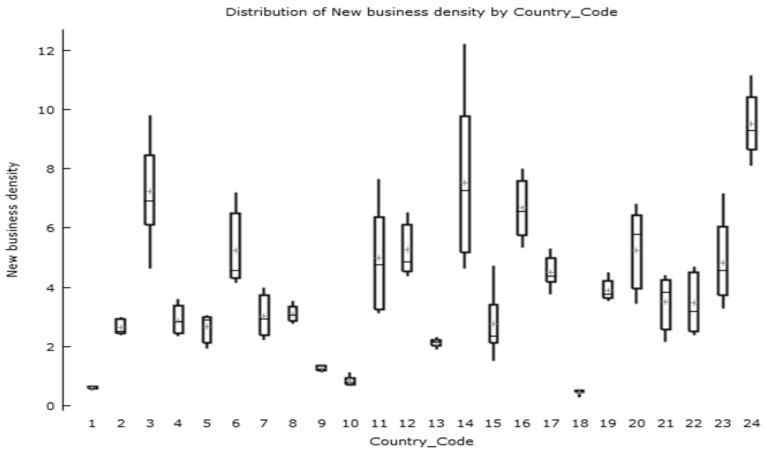
From the factorized boxplot of the credit rate in function of country code during 2004-2012, we notice that the highest mean of credit rate we encounter in Denmark and the highest variation in Luxembourg. The lowest mean of the credit rate is found in Romania and the lowest variation in Germany.

The factorized boxplot of the inflation rate in function of country code during 2004-2012 shows that the highest mean of the inflation rate we encounter in Romania and the highest variation in Latvia. The lowest mean of the inflation rate is found in Ireland and the lowest variation in Belgium.

From the factorized boxplot of the unemployment rate in function of country code during 2004-2012, we notice that the highest mean of the unemployment rate we encounter in the Croatia and the highest variation in Ireland. The lowest mean of the unemployment rate is found in Sweden and the lowest variation in Austria.

Figure 2

Distribution of new business density by Country code



Source: Own calculations in Gretl

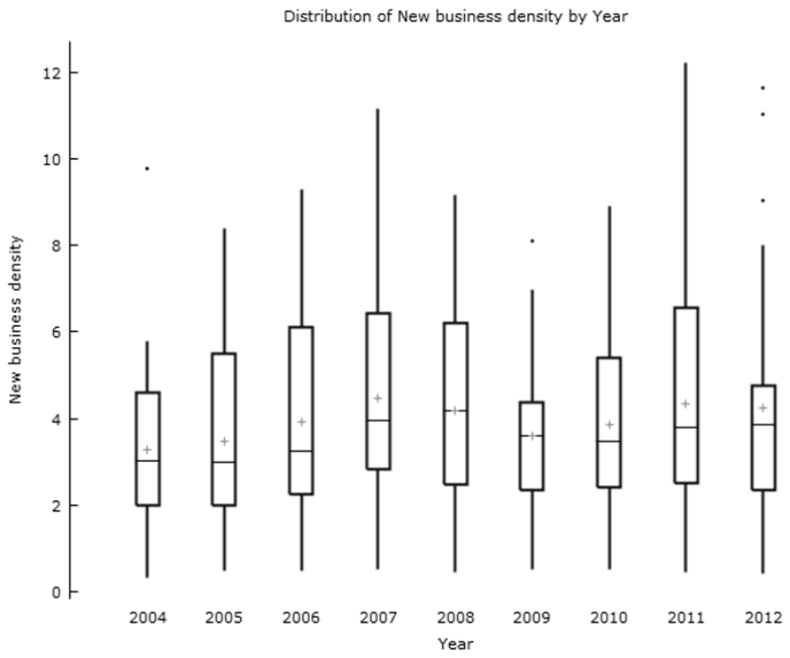
The factorized boxplot of the GDP per capita growth in function of country code during 2004-2012 illustrates that we encounter the highest mean of GDP per capita growth in Lithuania

and the highest variation in Latvia. The lowest mean is found in Greece and the lowest variation in France.

From the factorized boxplot of the new business density in function of year during 2004-2012 for all the 24 EU member states we notice that the highest mean of new business density we encounter in 2007 and the highest variation in 2012. The lowest mean of the new business density was found in 2004 and the lowest variation in 2009.

Figure 3

Distribution of new business density by years



Source: Own calculations in Gretl

The factorized boxplot of the tax rate in function of year during 2004-2012 for all the 24 EU member states we notice that the highest mean of tax rate we encounter in 2007 and the highest variation in 2012. The lowest mean of the tax rate was found in 2010 and the lowest variation in 2004.

From the factorized boxplot of the inflation rate in function of year during 2004-2012 for all the 24 EU member states we notice that

the highest mean of inflation rate and the highest variation we encounter in 2007. The lowest mean of the inflation rate is found in 2010 and the lowest variation in 2012.

The factorized boxplot of the credit rate in function of year during 2004-2012 for all the 24 EU member states shows that the highest mean of credit rate we encounter in 2009 and the highest variation in 2009. The lowest mean of the credit rate was found in 2004 and the lowest variation in 2004.

From the factorized boxplot of the unemployment rate in function of year during 2004-2012 for all the 24 EU member states we notice that the highest mean of unemployment rate we encounter in 2012 and the highest variation in 2007. The lowest mean of the unemployment rate is found in 2009 and the lowest variation in 2010.

The factorized boxplot of the GDP per capita growth in function of year during 2004-2012 shows that the highest mean of GDP per capita growth we encounter in 2006 and the highest variation in 2009. The lowest mean of the GDP per capita growth is found in 2009 and the lowest variation in 2010.

5. Econometric models and main results

There are three models for panel data – pooled OLS, fixed and random effects models. We want to explain new business density (Newbs) in terms of the inflation rate (Infl), credit rate (Credit) and the unemployment rate (Unempl) and thus to estimate the following equation:

Equation 1 The general panel data equation

$$Newbs_{it} = \alpha + \beta_1 Infl_{it} + \beta_2 Credit_{it} + \beta_3 Unempl_{it} + u_{it}$$

$$i=1,\ldots,24;\ t=2004,\ldots,2012$$

In the Fixed Effects (FE) model we decompose the error term u_{it} into a unit specific (and time invariant) component α_i and observation-specific error ε_{it}:

Equation 2 The Fixed-Effects equation

$$Newbs_{it} = \alpha + \alpha_i + \beta_1 \times Infl_{it} + \beta_2 \times Credit_{it} + \beta_3 \times Unempl_{it} + \varepsilon_{it}$$

$$i=1,\ldots,24;\ t=1,\ldots,9$$

The α_is are then treated as fixed parameters that must be estimated. The α_is may be treated as the mean of the error in the i^{th} unit. However, these individual intercepts are typically not of much inherent interest and also their estimated values are difficult to judge

because there is often little data being used to estimate them (the time series are usually short, only 9 instances). Instead, we are usually more interested in the slope coefficients (Lapinskas 2013).

Model 1: Fixed-effects, using 216 observations

Included 24 cross-sectional units
Time-series length = 9
Dependent variable: Newbs

Table 3

Fixed-effects model for the raw panel data

	coefficient	**std. error**	**t-ratio**	**p-value**	
Const	1.69	0.73	2.31	0.02	**
Infl	0.09	0.03	2.96	0.00	***
Credit	0.01	0.00	2.24	0.03	**
Unempl	0.02	0.01	2.12	0.04	**

Source: Own calculations in Gretl

Table 4

Output for the fixed-effects model

Mean dependent var	3.93	S.D. dependent var	2.45
Sum squared resid	186.24	S.E. of regression	0.99
LSDV R-squared	0.86	Within R-squared	0.07
LSDV F(26, 189)	42.91	P-value(F)	0.00
Log-likelihood	-290.48	Akaike criterion	634.96
Schwarz criterion	726.09	Hannan-Quinn	671.78
Rho	0.69	Durbin-Watson	0.57

Source: Own calculations in Gretl

Joint test on named regressors
 Test statistic: F(3, 189) = 4.54473
 with p-value = P(F(3, 189) > 4.54473) = 0.00422465
Test for differing group intercepts -
 Null hypothesis: The groups have a common intercept
 Test statistic: F(23, 189) = 32.5388
 with p-value = P(F(23, 189) > 32.5388) = 1.57863e-053

The test for differing group intercepts tell us that the hypothesis of all equal α_{is} must be rejected, so each group has a different intercept.

For the **Random Effects (RE) model,** we write $\mathbf{u_{it} = \upsilon_i + \varepsilon_{it}}$, so the model becomes

Equation 3 The Random Effects equation

$$Newbs_{it} = \alpha + \vartheta_i + \beta_1 \times Infl_{it} + \beta_2 \times Credit_{it} + \beta_{3x} Unempl_{it} + \varepsilon_{it}$$

i=1,…,24; t=1,…,9

In contrast to the FE model, the $\mathbf{\upsilon_i}$s are now treated not as fixed parameters but as random drawings from a given probability distribution.

Model 2: Random-effects (GLS), using 216 observations

Included 24 cross-sectional units
Time-series length = 9
Dependent variable: Newbs

Table 5

Random-effects (GLS) model

	coefficient	std. error	t-ratio	p-value	
Const	1.46	0.78	1.87	0.06	*
Infl	0.11	0.03	3.55	0.00	***
Credit	0.01	0.00	3.23	0.00	***
Unempl	0.02	0.01	1.85	0.07	*

Source: Own calculations in Gretl

Table 6

Output for the random-effects model

Mean dependent var	3.93	S.D. dependent var	2.45
Sum squared resid	1081.12	S.E. of regression	2.25
Log-likelihood	-480.42	Akaike criterion	968.84
Schwarz criterion	982.35	Hannan-Quinn	974.30

Source: Own calculations in Gretl

'Within' variance = 0.985391
'Between' variance = 2.91188
theta used for quasi-demeaning = 0.806092

Breusch-Pagan test
Null hypothesis: Variance of the unit-specific error = 0
Asymptotic test statistic: Chi-square(1) = 379.359
with p-value = 1.71637e-084

Hausman test
Null hypothesis: GLS estimates are consistent
Asymptotic test statistic: Chi-square(3) = 15.4304
with p-value = 0.00148341

In the Breusch–Pagan test, the null hypothesis is that the variance of u_i in equation 3 equals zero. This hypothesis is rejected, so we conclude that the simple pooled model is inadequate.

If the theta value is 1, then the FE estimator is optimal; if it is 0, then the pooled model is optimal. Thus, in our case we choose FE model (theta=0.8).

The Hausman test probes the null hypothesis that the RE model is preferable to that of the fixed effects (we see that in our case we can discard the RE model).

The Akaike's criterion in RE case exceeds that of FE. Also, we plotted the graphs of the fitted values and residuals of the RE model, and they appear to be inferior to those of the FE model. Therefore, the Fixed-Effects model is better than the Random-Effects model and the final form of the econometric model will be:

Equation 4 The Econometric Model – Fixed Effects model

$$Newbs_{it} = \alpha + \alpha_i + 0.09 \times Infl_{it} + 0.01 \times Credit_{it} + 0.02 \times Unempl_{it} + \varepsilon_{it}$$

$$i=1,\ldots,24; \quad t=2004,\ldots,2012$$

From the Fixed-Effects model we notice that the variables inflation rate, credit rate, and unemployment rate have a statistically significant impact on the new business density for the 24 EU member states during 2004-2012 at a 1% and 5% significance level.

The econometric model tells us that when the inflation rate increases with one percent the new business density rises with 0.09 units; when the domestic credit to private sector by banks (% of GDP) goes up with 1% the dependent variable increases with 0.01 units and as the long-term unemployment (% of total unemployment) grows with 1% the new business density rises with 0.02 units.

Taking into consideration the fact that panel data do not fixes the issue of unobserved heterogeneity and endogeneity and that under endogeneity the FE-estimator will be biased, we can apply for

future research special regression models by using IV-estimation (2SLS, GMM) that employs at least one instrument and identifies assumptions to get the unbiased estimator.

6. Conclusions and Recommendation

Our analysis suggests that the Fixed-Effects model is the best to explain the dependent variable new business density among the three models for panel data – pooled OLS, fixed and random effects models. Although we have employed in our analysis five explanatory variables, the GDP growth rate and the tax revenue as a percentage of GDP were discarded from the model because of the statistically insignificant coefficients.

From the correlation matrix for the raw data we notice that the new business density variable is positively correlated with the tax rate, inflation rate, credit rate and GDP per capita growth and negatively correlated with the unemployment rate.

The Within Standard Deviation is greater than the Between Standard Deviation for the variables Inflation rate and GDP per capita growth, i.e. the variation between the countries is greater than the variation across time for these variables. For the variables new business density, tax rate, credit rate and the unemployment rate the variation is higher across time than across countries.

From the Fixed-Effects model we notice that the variables inflation rate, credit rate, and unemployment rate have a statistically significant impact on the new business density for the 24 EU member states during 2004-2012 at a 1% and 5% significance level.

Our analysis is consistent with the literature review on start-ups, i.e. a positive correlation between the business entries and inflation, credit rate and the unemployment rate (Congregado et al. 2012).

From the literature review on macroeconomic factors influencing entrepreneurship or the registration number of new companies emerge several policy recommendations. We believe that the increase in new registrations of SMEs EU member states governments should take some measures. In this regard we propose the following solutions:

- ✓ to stimulate investment in technology;
- ✓ to increase inflation rate (the number of new companies is positively correlated with inflation – Salman, 2013);

- ✓ to open up the economy;
- ✓ to levy lower taxes;
- ✓ to increase marginal tax rates;
- ✓ to increase tax incentives and tax exemptions in order to stimulate private lending practices;
- ✓ to promote favorable interest rates;
- ✓ to attract foreign investments;
- ✓ to create programs that drive the development of entrepreneurial skills;
- ✓ to Increase the share of R&D expenditure in total government spending;
- ✓ to increase the unemployment rate (explanation is given by Congregado et. Al., 2012 - during periods of high unemployment people are driven by self-employment due to the decrease of alternative sources of income such as paid employment).

Based on empirical results we can make the following policy recommendations for policy makers in the EU member states in order to increase in new registrations of SMEs:

- to increase inflation (according to Salman, 2013 - the number of new companies is positively correlated with inflation);
- to stimulate private lending practices - according to Aghion, Fally and Scarpetta (2007), Friedman and Hall (2014);
- to increase unemployment (explanation given by Congregado et. Al. (2012) - during periods of high unemployment people are driven by self-employment due to the decrease of alternative sources of income such as paid employment and Highfield & Smiley in 1987 – a rise in unemployment rate is followed by increases in new registrations).

For further research, the birth of new firms could also be explained by the number of insolvencies, other sources of financing, the government expenditures, interest rates and education variables. Time dummies could be introduced in the Fixed-Effects Model in order to improve it. We also think that the non-linear relationship between the variables analyzed should be taken into consideration for future research.

Our findings might be of interest to policy makers in the European Union in order to prepare a better economic, social and

monetary policy for the public sector, as well as to the private sector and to the banking sector.

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ANNEX 1

Data definition
Indicator Names, Long Definition and Source

Tax revenue (% of GDP) - Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue. Source: International Monetary Fund, Government Finance Statistics Yearbook and data files, and World Bank and OECD GDP estimates.

Inflation, GDP deflator (annual %) - Inflation, as measured by the annual growth rate of the GDP implicit deflator, shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. Source: World Bank national accounts data and OECD National Accounts data files.

Domestic credit to private sector by banks (% of GDP) - Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit-taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises. Source: International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates.

Long-term unemployment (% of total unemployment) - Long-term unemployment refers to the number of people with continuous periods of unemployment extending for a year or longer, expressed as a percentage of the total unemployed. Source: International Labour Organization, Key Indicators of the Labour-Market database.

GDP per capita growth (annual %) - Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated

without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. Source: World Bank national accounts data and OECD National Accounts data files.

New business density (new registrations per 1,000 people ages 15-64) - New businesses registered are the number of new limited liability corporations registered in the calendar year. Source: World Bank's Entrepreneurship Survey and database (http://econ.worldbank.org/research/entrepreneurship).

Data codification

We have noted the variables as follows:

Table 7

The variables used in the econometric model

Tax revenue (% of GDP)	Tax
Inflation, GDP deflator (annual %)	Infl
Domestic credit to private sector by banks (% of GDP)	Credit
Long-term unemployment (% of total unemployment)	Unempl
GDP per capita growth (annual %)	GDP
New business density (new registrations per 1,000 people ages 15-64)	Newbs

Source: World DataBank

We have encoded the EU member states as follows:

Table 8

The countries used in the data panel model and their codes

Country	Code	Country	Code
Austria	1	Italy	13
Belgium	2	Latvia	14
Bulgaria	3	Lithuania	15
Croatia	4	Luxembourg	16
Czech Republic	5	Netherlands	17
Denmark	6	Poland	18
Finland	7	Portugal	19
France	8	Romania	20
Germany	9	Slovenia	21
Greece	10	Spain	22
Hungary	11	Sweden	23
Ireland	12	United Kingdom	24

Source: Own codification in Gretl

THE EFFECTS OF THE FEDERAL RESERVE'S TAPERING ANNOUNCEMENTS ON THE US REAL ESTATE MARKET

Adrian Cantemir CĂLIN, PhD*

Abstract

In May 2013, the Federal Reserve revealed its intentions to gradually reduce its quantitative easing programs, and at some point end them. The announcement of what became in the meantime known as tapering triggered significant reactions from international financial markets. Using an event – study approach, this paper tries to determine the impact of tapering news on the US real estate market. The results indicate the fact that the tapering announcements had a dim influence on the above mentioned market.

Keywords: tapering, Federal Reserve, real estate market, monetary policy

JEL Classification: E58, R30, G14.

1. Introduction

After the global economic recession of 2008, the main central banks were forced to use a series of unconventional initiatives in order to reestablish the balance of the economic system, promote credit operations and underpin economic growth. These measures are known as quantitative easing (QE) and have been intensively debated by academics, policy makers and the general public. The academic interest resulted in a strong and extensive literature that focused on the QE efforts of the four major central banks: European Central Bank, Federal Reserve, Bank of England and Bank of Japan.

Key studies on the topic of quantitative easing and its effects on various financial assets have been put forward by: Gagnon et al. (2011) D'Amico et al (2012), Kapetanios et al. (2012), Szczerbowicz (2012), Lupu and Călin (2014a), Joyce et al (2014) or Lupu and Călin (2014b), while Criste and Lupu (2014) emphasizes the changing role of the central bank in the post-crisis era.

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The involvement of The Federal Reserve in quantitative easing was extremely visible and thorough. The large scale asset purchase programs consisting in acquisitions of mortgage backed securities, agency bonds or treasuries greatly expanded the Fed's balance sheet. However, on May 22 2013 Chairman Bernanke announced the intention of gradually reducing asset purchases. This phenomenon, called "tapering" caused a major surprise for the financial markets generating a serious rise in volatility. Tapering has become the subject of recent literature that in general deals with its impact on the assets of emerging markets.

After years of extraordinary expansion, that had its peak in the 2003 – 2005 period, the U.S. real estate market was faced with a robust contraction. The fall of house prices led to what was called the sub – prime mortgage crisis, which generated a series of shocks for the financial system, resulting in famous defaults or bailouts (Belingher and Călin, 2013). This represented a major factor for the global financial crisis. Given its relevance, it was naturally targeted by Federal Reserve policies that aimed to restore functionality to the economic system.

This paper contributes to the academic literature by investigating the existence of a potential influence of Federal Reserve's tapering on the US real estate market. To the author's knowledge, this is the first analysis that aims in this direction.

The remainder of this paper is organized as following. Section II deals with the related literature, especially focusing on the research that considers the effects of tapering. Section III covers the topic of data and methodology, while section IV presents the results.

2. Literature review

This paper relates to the existing literature from two perspectives. Firstly it follows in the footsteps of the research that considers the effects of tapering on various financial assets or markets.

The first investigation of the Fed tapering is present in Eichengreen and Gupta (2013). The authors report that the most significant tapering impact was observed for the countries that permitted a serious appreciation of the exchange rates in the moments when the quantitative easing was thought to continue.

Aizenman et al. (2014) try to assess the impact of tapering announcements on the financial markets of emerging markets. The authors use announcements that relate to both quantitative easing and tapering and an investigation window that ranges between 27 November 2012 and 3 October 2013. From a methodologic point of view, Aizenman et al employ a fixed effects panel model and report that the assets of the emerging markets are more sensitive to Bernanke's speeches than to the communications of other Fed representatives.

In a similar way, Dahlhaus and Vasishtha (2014) focus on the impact of American monetary policy on the transmission of portfolios towards major emerging countries. Employing a vector autoregressive model, the authors show that the impact of what they call "policy normalization shock" on portfolio flows as a fraction of the GDP is not significant. In addition to this, Dahlhaus and Vasishtha (2014) assert the fact that this effect is in concordance with the reality observed in the summer of 2013.

Mishra et al (2014) explore the same area of QE and tapering impact on emerging market fundamentals through an event study analysis. Using daily data for bonds and equity they find that countries with more consolidated macroeconomic fundamentals and more developed financial markets are less sensitive to the above mentioned initiatives.

Matheson and Stavrev (2014) use a VAR model based on equity prices and 10 year bond yields in order to study long-term interest rates relative to the speech conducted by Chairman Bernanke on the 22nd of May 2013. The authors report that the significant rise in 10-year Treasury bond yields that followed May 2013 can be attributed to shocks in monetary policy. The authors also highlight the relevance of central bank communication and transparency.

Meinusch and Tillmann (2015) study the way in which popular beliefs about the tapering process influence asset prices. They also use a VAR model, but inovate through the use of social media in order to have an image about beliefs on the timing of the tapering process. Meinusch and Tillmann (2015) report that these beliefs tend to have a contradictory influence on asset prices. One interesting result is the fact that social media messages can be relevant for market sentiment and thus for the dynamics of asset prices.

Ogawa and Wang (2015) set out to observe the way in which variations in the interest rates in the US alter the evolution of interest rates, capital, and exchange rates in a series of East Asian countries. In addition to this, the authors forecast the future effects of tapering on the above mentioned countries. The conclusions of the study indicate that the raise of interest rates in the US will lead to a similar effect in the East Asian countries. Besides this effect, the emerging markets will face a significant reduction in capital inflows.

In an investigation that focuses on the effects of speeches belonging to officials of central banks, Călin (2015) shows that currency markets are considerably affected in terms of volatility by the official communications that deal with quantitative easing or tapering.

Secondly, this paper relates to the research that focuses on the relation between monetary policy initiatives and the real estate market. Far from being a large block of literature, these initiatives cover certain interconnections between the above mentioned elements.

Vargas-Silva (2007) studies the effects of monetary policy shocks on the American housing markets extending the methodology introduced by Uhlig (2005). The study concludes that residential investments react negatively to contractionary monetary policy initiatives.

Iacoviello and Minetti (2007) focus on the credit channel of monetary policy in relation to the housing market for four states: UK, Germany, Norway and Finland. In VAR setup, the authors demonstrate the presence of this channel that influences the development of the real estate market.

Jarocinski and Smets (2008) conduct an industrious investigation that uses a BVAR approach in order to study the US housing market. One of the objectives of the research is to determine how the US monetary policy influenced the housing market. The authors observe that this policy triggers relevant effects on house prices and housing investments. In addition to this, the authors argue that the anti-deflationary monetary policy specific to the 2002 – 2004 interval had an important role in the real estate boom of 2004 and 2005.

Calza, Monacelli and Stracca (2013) target the way in which the structure of housing finance influences the transmission of monetary policy shocks. Using a DSGE model, the authors show that

house prices and investments are more sensitive to monetary policy shocks for the countries with mature mortgage markets.

Luciani (2015) focuses on the polies carried out by Federal Reserve and their role in the dynamics of the US housing market and its contraction. The author concludes that the Fed's expansionary policy had an insignificant impact on the housing cycle. Moreover, the author points out the fact that a restrictive policy would not prevent the housing market recession.

Chiang, Sa-Aadu and Shilling (2015) focus on the potential influence of Fed's quantitative easing initiatives on the abnormal evolution of housing starts in the US. The authors construct four aggregate liquidity measures in order to capture the QE impact and observe that housing starts are connected over time with the dynamics of these aggregate factors.

3. Data and methodology

The analysis uses on one hand a series of 14 tapering and quantitative easing announcements. These cover the 22.05.2013 - 29.10.2014 period and have been gathered from the press releases issued by the Federal Reserve. The methodology also involves daily prices for a series of nine stocks belonging to US real estate companies. The data have been collected from the DataStream platform and cover the 31.12.2010 – 8.06.2015 interval. The nine companies have been chosen so as to be representative for all the fields and subfields of real estate activity, ranging from commercial, residential and hospitality real estate to virtually any kind of land or home acquisition, exploitation or development. Therefore, the following companies have been included in the present analysis: American Leisure Holdings Inc., Biloxi Marsh Lands Corporation, Bresler & Reiner Inc., Asia Properties Inc., Princeton Capital, Eagle Exploration Company, HomeFed Corporation, Kaanapali Land, Pramerica Real Estate Investors. Figure 1 bellow shows the dynamics of the prices of the nine stocks.

From a methodological point of view, the paper builds on the specifications of Albu et al. (2014 a) and Albu et al. (2014 b) bringing forth an econometric event study approach. The corner stone of the event study is the ARMA (1, 1) – GARCH (1, 1) calibrated for 100 days. The model is depicted by the following equations:

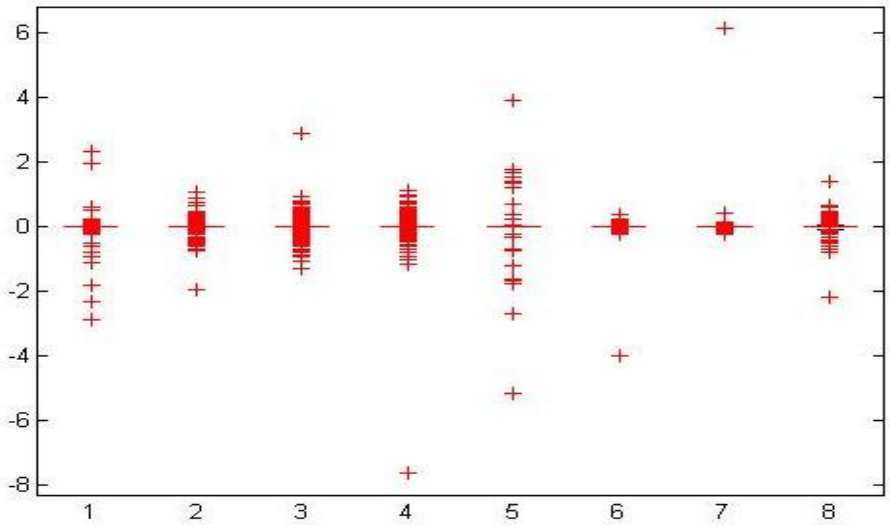
$$R_{t+1} = pR_t + q\varepsilon_t + \varepsilon_{t+1},\ \varepsilon_{t+1} \sim N(0, \sigma_{t+1})$$

$$\sigma^2_{t+1} = \omega + \sum_{i=1}^{p} \alpha_i R^2_{t+1-i} + \sum_{j=1}^{q} \beta_j \sigma^2_{t+1-j}$$

Where $\alpha + \beta < 1$

Figure 1

Boxplot for the input data



Source: Author's computation

For each tapering announcement, the methodological construction isolates an event window of 41 days, basically allowing a time frame of 20 days before and after the launch date. Using the GARCH – predicted variances for this interval and comparing them with the squared returns of the date, the model extracts the abnormal returns.

Therefore, the abnormal returns stand for the differences between the real values and the estimated values of the returns for the event window (from -20 to +20). This analysis extends the approach of the above mentioned references and computes also cumulative abnormal returns. These values represent the cumulated

values of the abnormal returns for the same period around the events (from -20 to +20).

In order to have a clear image of the statistical significance of the results t-stats are computed for the two types of results mentioned above.

4. Results

Figures 2 and 3 summarize the results found in terms of abnormal and cumulative abnormal returns relative to the data set.

On an aggregate level, the announcements of tapering initiatives issued by the Federal Reserve had a fragile influence on the dynamics of the analyzed instruments.

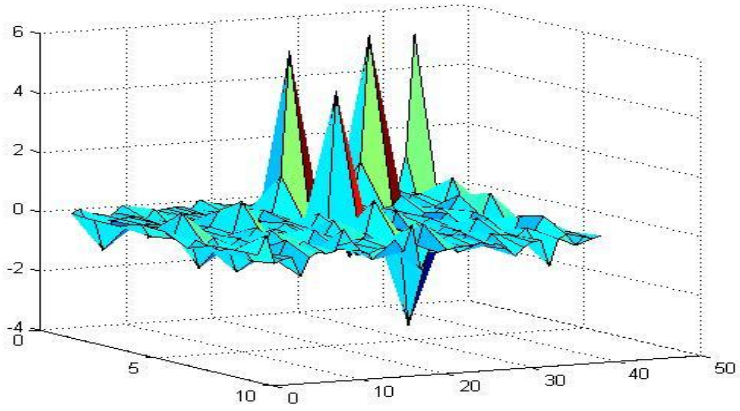
The returns of *American Leisure Holdings Inc*. show a vague influence from the above mentioned announcements towards the end of the event window. Though statistically significant, and important in magnitude, this is the only reaction found in this case. *Biloxi Marsh Lands Corporation* follows a similar pattern, the results reporting an impact around the second half of the (0 - +20 interval).

A more significant impact is found in the case of *Asia Properties* and *Princeton Capital*. On average, the news related to tapering announcements tend to lead to abnormal returns on the launch date of a certain event (day zero).

The financial assets of *HomeFed Corporation* also tend to react to tapering news. The results show a clear statistical effect on the first 3 days following day zero.

Figure 2

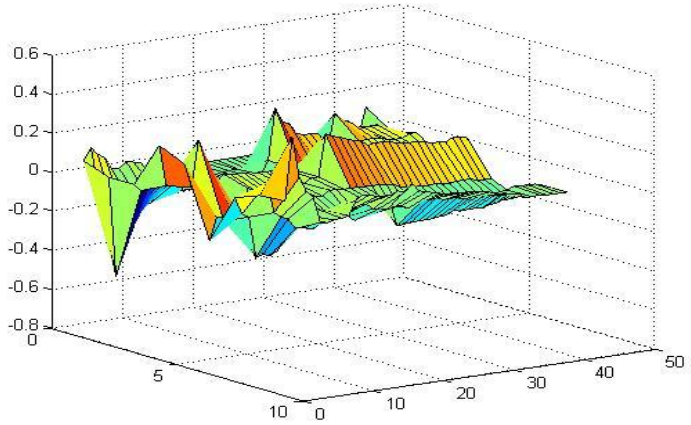
Abnormal returns



Source: Author's computation

Figure 3

Cumulative abnormal returns



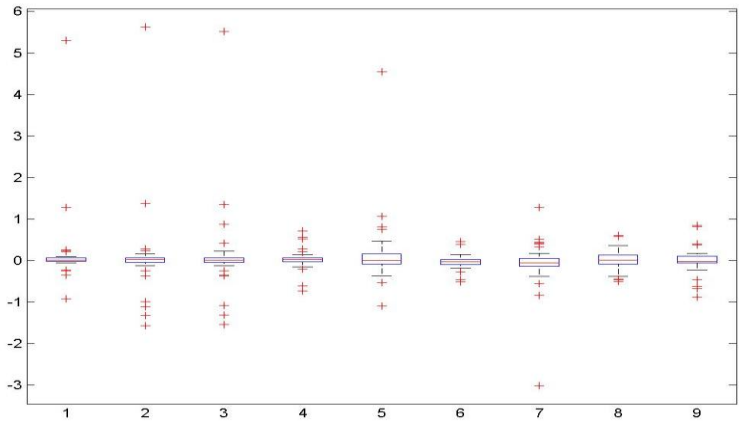
Source: Author's computation

The other four stocks included in this analysis do not react to tapering – talk in a statistically significant way.

The study of the cumulative abnormal returns is not any more revealing. The results again do not exhibit any type of influence that could be attributed to Federal Reserve's tapering activity.

Figure 4

Boxplot of abnormal returns



Source: Author's computation

Figure 4 presents the boxplot characterization of the abnormal returns found in the study. It shows the average distributions of the abnormal returns for each asset included in the analysis. It can be noticed that the abnormal returns have the tendency to be placed around the same average. Only a few of them are placed far from the mean, which means that there is a low tendency towards significant reaction of real estate equity markets generated by the tapering announcements.

5. Conclusions

The purpose of this paper is to investigate the effects of the Federal Reserve's tapering on the dynamics of the US real estate market. For this purpose the methodology is built on a series of 14 tapering announcements and a set of stock quotes belonging to real estate companies and uses an event study approach.

Our results point out the fact that the tapering initiatives have a feeble effect on the development of the real estate market. We find traces of response only for five of the companies included in the study. The reaction is weak both in terms of abnormal returns and

cumulated abnormal returns. In general, the impact is observed either for the announcement day of the events or for the interval that follows.

Acknowledgement

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THE FISCAL FRAMEWORK IN ROMANIA – THE EFFICIENCY OF FISCAL RULES

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Abstract

The response of the fiscal policy makers to the fiscal crisis in Romania from 2009-2010 was the initiation of a comprehensive program of fiscal consolidation in mid-2010 alongside with a fundamental modification of the institutional framework within operates the fiscal policy, namely switching to a precisely defined rules-based fiscal framework compared to the previously existing broad discretion. The effectiveness of a fiscal rule is given by the constraint it imposes on the behavior policy makers. This research examines the effectiveness of the fiscal rules introduced by Romania in 2010 through the Fiscal Responsibility Law by assessing the ex-ante and ex-post compliance with the rules and concludes that this was rather reduced, the fiscal rules failing to exert strong constraints on the behavior of policy makers. In this context, it is necessary a reform of the existing fiscal rules, especially in the context of implementing in the national legislation since 2014 of the rules stipulated in the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union.

Keywords: fiscal policy, fiscal governance, fiscal rules

JEL Classification: E62, H11, H62

1. Introduction

The conduct of fiscal policy in Romania during 2005-2008 was strongly expansionary acting towards stimulating the economy, even when it has performed well above potential. The headline budgetary deficits recorded in 2005-2008 of 1.2% of GDP, 2.2% of GDP, 2.9% of GDP and 5.7% of GDP respectively corresponding to structural deficits of 2.3% of GDP, 3.5% of GDP, 2.9% of GDP and 8% of GDP respectively showed, beyond a pro-cyclical nature, a lack of discipline

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of the fiscal policy. This was fully revealed later, after the onset of the economic and financial crisis in the third quarter of 2008, the budgetary deficit in the next year reaching a particularly high level of around 9% of GDP while the trajectory of the public debt has become one characterized by a steep advance, increasing by 17 pp of GDP in 2010 compared to 2008. The magnitude of the fiscal imbalances accumulated triggered a broad process of fiscal consolidation in 2010, and with it was initiated a comprehensive reform of the institutional fiscal framework.

If before 2010, the fiscal policy was guided only by the 3% headline deficit ceiling stated in the Maastricht Treaty, as the period from the EU accession in 2007 and the moment when the economic and financial crisis emerged was not enough for the successful implementation of the corrective arm of the Stability and Growth Pact, the new fiscal framework based on the Fiscal Responsibility Law no. 69/2010 imposed the formulation of the fiscal policy coordinates in a setting characterized by more stringent rules compared to the large discretion from the past.

Even if *de jure*, fiscal policy seems to be set in a framework characterized by strict rules, is it of interest to assess in practice how the decision makers complied with these rules, both *ex-ante*, i.e. when formulating the draft budget or the budget amendments and *ex-post*, i.e. based on the budgetary execution. The motivation of this research consists in assessing how operational is the rule-based fiscal framework in Romania and if it managed to successfully eliminate the discretion of fiscal policy, characteristic to the period before the crisis.

This research aims to evaluate the effectiveness of the fiscal rules introduced in Romania in 2010, namely the extent to which they were able to constrain the behavior of fiscal policy makers. The contribution of the paper to the existing literature consists in a comprehensive assessment of the compliance with the national fiscal rules introduced by the Fiscal Responsibility Law in 2010 which is further used to formulate conclusions about the efficiency of fiscal rules in Romania as the latter is largely given by the degree of constraint that they impose on the policy makers. The paper is structured as follows: the next section makes an overview of the debate from the literature regarding rules versus discretion in fiscal policy, followed by the presentation of the fiscal framework characteristics in Romania, the assessment of the effectiveness of

fiscal rules and the conclusions and implications for economic policy makers.

2. Rules versus discretion in fiscal policy

Achieving the objectives of macro stabilization and ensuring debt sustainability by public finances can be achieved in a framework based on rules or one based on discretion. If in the second case, the advantage is represented by flexibility and possibility to respond timely to shocks manifested in an economy, a policy based on rules has the advantage of reducing the problem of time inconsistency, respectively the temptation to abandon a preannounced policy subsequent to the formation of the economic agents' expectations. Also, a frequently encountered argument in the literature in the favor of rules is the fact that fiscal policy is a too strong instrument for being left in the hands of policy makers and it is preferable the existence of a constraint for their behavior.

One of the arguments for fiscal activism is the ability to react to the position in the economic cycle, which may not occur in the case of an option to rules. Fatas and Mihov (2006) investigate using data from 48 states in the USA the effect of adopting quantitative restrictions at the fiscal policy level on the macroeconomic volatility. The authors show that stricter budgetary rules leads to a lower volatility of the fiscal policies, respectively less discretion and diminishes the fiscal policy response to output shocks, by reducing the modifications of the budgetary expenditures coordinates. These two effects have opposite effects on GDP volatility, but the authors show that the first effect, which acts to a lower output volatility prevails, which essentially is another argument in favor of rules.

Moreover, discretion generally failed to generate a countercyclical conduct of the fiscal policy, especially for developing countries. For example, Frankel et al. (2012) identifies pro-cyclical behavior or in the worst case an acyclic behavior of fiscal policy in developed countries and generally pro-cyclical in developing countries. However, in the case of the latter, during the 2000s, a third managed to escape from the trap of pro-cyclicality and the authors demonstrated that this development is closely linked to the quality of the institutions that appears as the key element. In support of this idea come the results of Adam and Iacob (2014) who, studying the impact of fiscal rules on fiscal consolidation in the post-crisis period

came to conclusion that efficient fiscal institutions, in the form of Fiscal Councils, can foster significantly the efficiency of the fiscal rules in enforcing budgetary discipline if they manage to generate sufficient reputational costs for the Government in case of non-compliance.

Alesina et. al (2008) investigating the causes that lead to this suboptimal policy mainly reach to an explanation regarding the agent problem from a political perspective. Thus, the pro-cyclical characteristic is favored by the voters behavior who want to reduce politicians rents. Thus, voters notice when the economy improves and demand more public goods or lower taxes which induce a pro-cyclical feature for fiscal policy. Also, for explaining this problem it cannot be ignored the specific pro-cyclicality of the financial markets, the supply of credit being much more abundant in periods of expansion and rarer in periods of recession. Governments respond to this situation by restricting the deficit in difficult times, as many developing countries have in these periods a limited access to loans or this is possible only at very high interest rates. On the other side, in the upward phase of the economic cycle, the loans are more affordable and governments choose to increase government spending in these periods. However, according to the above mentioned authors, the political argument prevails given that countries could for instance accumulate reserves through borrowing in advance in periods of expansion. Increasing the propensity of the Government to spend in the presence of additional income is also shown by Talvi and Vegh (2005) and an explanation of this is represented by the fact that when there are more available resources, the fight for them is intensifying and leads to budget deficits.

Bergman and Hutchinson (2014) analyze the extent to which fiscal rules may help to reduce the pro-cyclicality of fiscal policy, namely the manner in which government spending reacts to changes in GDP, through a panel analysis which includes 81 developed countries or emerging countries during 1985-2012. The authors also build composite indicators of fiscal rules based on which they analyze the extent to which the introduction of rules causes a reduction in the pro-cyclicality of fiscal policy. The results show that the fiscal rules are effective in reducing the pro-cyclicality, but only after a certain threshold in terms of the quality and efficiency of governance is reached. Thus, only government efficiency is not sufficient to reduce the pro-cyclicality of fiscal policy, but in combination with fiscal rules,

there can be obtained spectacular results regarding the reduction of the pro-cyclicality and, above a certain threshold, it can be generated even a countercyclical fiscal policy. The authors also show for the countries with low efficiency of governance, that a solution to mitigate the pro-cyclicality of fiscal policy is the adoption of supranational rules.

Given the option for fiscal rules the question that arises is about their effectiveness. Bernanke (2010) identifies four factors that decisively contribute to achieving a high level of efficiency for fiscal rules: transparency, orientation to ambitious targets, the possibility to exercise a direct control by policy makers, understanding and support of the general public of the chosen rules.

Bianchi and Menegatti (2007) summarize the arguments mentioned in the literature that advocate for rules to the detriment of discretion regarding fiscal policy. Thus, there may be mentioned the distortions and financing costs generated by budgetary deficits, the crowding out of investment which implies that the financing needs of the state as a result of increasing budgetary deficit leads to higher interest rates throughout the economy and to lower private investment, the Ricardian equivalence that postulates the inefficiency of the fiscal policy to stimulate the production due to the reaction of private agents who respond to the fiscal stimulus through savings in anticipation of some higher future taxes, the existence of a propensity to deficits of governments for purely political reasons, the ensuring of the public finances sustainability to prevent negative consequences in the short and long-term of fiscal crisis. Also, in the monetary union such as the euro area, the stabilization of the share of public debt to GDP is more important to prevent the contagion effect on other countries and also not to create additional difficulties regarding monetary policy decisions. To investigate the technical advantages and disadvantages of rules versus discretion regarding fiscal policy, the authors apply a Kydland-Prescott framework for considering the time inconsistency problem. So, it is considered the tradeoff between production and stabilization of debt starting from the latter dynamics equations considering also the existence of risk premium linked to the probability of bankruptcy for a country. The model has shown that choosing a discretionary policy creates a tendency towards deficits, a problem exacerbated by the reaction of financial markets that increase risk premiums in anticipation of higher deficits.

Barbone et. al (2010) studied the case of emerging economies, namely Poland, Russia, Turkey regarding the relationship between fiscal performance and reform of the fiscal framework using data from the years 2000 and concluded that not all reforms have produced the expected results, particularly fiscal rules which proved ineffective for being operational during a crisis due to their inflexibility, but other institutional reforms have helped to improve fiscal governance and public finance position.

Bova et al (2014) examine the relationship between fiscal rules and pro-cyclical fiscal policies in emerging and developing economies. The authors note that in most cases, in these countries, fiscal policies were pro-cyclical with a negative effect on welfare and economic growth, but this behavior has been less pronounced in the last 10 years, a period that coincided with the adoption of fiscal rules, suggesting a possible link between them. However, from a theoretical perspective this link is ambiguous given the fact that by the enforcement of strict fiscal policy, the rules could prevent the reaction to the position in the economic cycle, but on the other hand, could prevent a significant increase of expenditure in periods of expansion and contraction during recessions. The authors conclude that the introduction of rules did not protect the emerging economies from pro-cyclicality, but the introduction of a new generation of rules with clearly defined escape clauses and more provisions which can strengthen the application of rules have the potential to reduce the pro-cyclicality of fiscal policy.

There are not in the literature any attempts so far, to my knowledge, to assess the efficiency of the fiscal rules introduced by Romania in 2010 through the Fiscal Responsibility Law or a structured analysis assessing the compliance with the fiscal rules for the entire period after their introduction. This analysis can help formulate conclusions about the degree of discretion regarding fiscal policy existent in Romania, the commitment of policy makes towards rules and about the current design of the rule-based fiscal framework.

3. The characteristics of the fiscal framework in Romania

The fiscal framework in Romania is, *de jure*, one based on rules, so there are in this regard specific national rules together with the fiscal rules imposed at European level. Chronologically speaking, in 2010 was adopted the Fiscal Responsibility Law no. 69/2010 which established a set of principles and rules for strengthening fiscal discipline. By definition, a rule is a provision exercising constraints on policy-makers in formulating the fiscal policy decisions, and in the present research will be considered only the so-called numerical rules, namely those referring to precisely quantifiable targets.

Thus, the rules that have guided the fiscal policy after 2010 had mainly focused on setting ceilings on the budget balance and primary balance, for total expenditures and also personnel expenses for two years. The fiscal policy before 2010 was oriented primarily on the short term, with no medium-term projection of the budgetary aggregates and the Fiscal Responsibility Law introduced the concept of medium term budgetary framework, which was to materialize in the so-called fiscal strategy. This should be promoted in the first 7 months of the year and would provide a complete projection of the budgetary aggregates (revenue, expenditure, deficit) for the next 3 years (with a starting point in the year after its adoption) and was also accompanied by the so-called Ceilings Law for some indicators specified in the fiscal framework which contained the above mentioned expenditure ceilings. It must be said from the start that the Fiscal Responsibility Law no. 69/2010 did not contain clear sanctions for violations of its provisions, the sanctions in case of non-compliance for the decision makers being more reputational. Regarding the ceilings law which represented the central element that would give a medium-term perspective to the fiscal policy, it was essential that this bill to be adopted before the budget law for next year so as to exert constraints when formulating the draft budget which would lead to predictability and fiscal discipline. The adoption of this law together with the budget law would mean identical projections in both laws, the ceilings law failing in this case to exert real constraints on policy makers in setting the fiscal policy coordinates.

As regards the actual formulation of the expenditure limits, there are two types of ceilings, expressed in nominal terms or as a percentage of GDP. The latter operates for the next 2 calendar years,

beginning with the next budgetary year and recognizes the difficulty of multi-annual projections in nominal terms, mainly because of the volatility in the main macroeconomic variables, namely GDP and inflation, while the role of the nominal ceilings is to exercise strong constraints when formulating the next year budget. It also have to be noted a ceiling for the primary balance, i.e. the budgetary balance net of interest expenses and this is to prevent any savings that are made on the interest expenses as a result for example of more favorable financing conditions to be spent for other purposes. Also, there is a ceiling on total expenditure in nominal terms applicable to the next budgetary year to prevent slippages on the expenditure side. It is to also to be noted that the rule on total spending refers to total expenditure less the amounts received from the EU so that, if better than anticipated absorption of European funds occurs the law permits to engage into additional spending without violating the rules, given the fact that the projects funded European funds are inextricably linked to the revenues received from the EU.

Beyond the provisions stated in the Fiscal Responsibility Law no. 69/2010, the fiscal policy in Romania, given the status of EU member of the country, falls under the Stability and Growth Pact, whose corrective component imposes a headline deficit of less than 3% while the preventive law establishes a budgetary balance target, respectively the so-called medium-term objective, expressed in structural terms. The aim is to achieve a budgetary balance, adjusted for the cyclical position of the economy capable of ensuring the stabilization of public debt and covering part of the additional costs of an aging population. The medium term objective for Romania, arising from the provisions of the Stability and Growth Pact was established as a deficit of 1.25% of GDP in structural terms.

In 2012, in response to the sovereign debt crisis in the Eurozone, 25 EU member states signed the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union, Romania being among the signatory states, which sets the establishment of new fiscal rules in Europe. Thus, it was imposed the obligation of a maximum structural deficit of 0.5% of GDP which could go up to 1% of GDP for countries, as was the case in Romania, with a low public debt. This rule was introduced with an automatic correction mechanism designed to quickly initiate measures in case of slippages, together with a theoretically more efficient system of sanctions. However, most countries received a broad enough term to

which they could apply the provisions of this new Treaty. Romania introduced into national law by the end of 2013 the structural deficit rule and the conditions governing the automatic correction mechanism, so that these can affect the ceilings law for the 2015 fiscal year. The Fiscal Responsibility Law now refers to a budgetary target equal with the medium-term objective but there is no any defined threshold, thereby allowing the target to be updated on the European Commission's decision. Given the provisions of the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union and the Stability and Growth Pact, the medium-term objective for Romania was established as a structural deficit of 1% of GDP.

4. The assessment of the efficiency of fiscal rules in Romania

Given the actual implementation of these new rules since 2015, this paper will analyze the effectiveness of fiscal rules, in terms of *ex-post* and *ex-ante* compliance and will refer only to the rules imposed by national law in 2010 in order to investigate the extent to which they exerted constraints at the level of the fiscal policy makers during 2011 -2015. Also, given the fact that the ceilings expressed as a percentage of GDP that should be mandatory for the next two years were basically updated every year during the new iteration of the ceilings law, an analysis of the actual compliance with them is relevant only for the following year in which they were established. Next it will be analyzed how the expenditure ceilings set by the annual laws were respected during 2011-2015.

The Law no. 275/2010 imposed expenditure ceilings for the **2011** budget year as follows: for the general government balance - 23,953.4 million lei (4.4% of GDP), the total expenditure net of financial assistance from the EU 194.419 million lei (35.71% of GDP) and staff costs 40 574 million lei (7.45% of GDP). The budgetary execution for 2011 confirms the compliance with the ceilings for the budgetary deficit and for personal expenses, but for the total expenditure it was exceeded by about 4.11 billion lei, which represents a significant difference compared to the proposed target. The latter is explained both by the implementation, during the budgetary rectifications, of swap compensation schemes designed to clear some arrears to the budget with symmetrical impact on

revenues and expenditures of about 2.5 billion lei, and also by some additional discretionary spending of about 1.6 billion lei.

These compensation schemes were intended basically to erase debts of state owned companies and did not involve an influence over the budgetary balance given their impact both on revenue and on expenditure, but clearly show a lack of financial discipline of state owned companies. Even if when assessing the fiscal rules, they could be considered as a valid exception, there is also the argument that such a scheme could be implemented without the violation of the fiscal rules, for example by considering these schemes since the draft budget. Furthermore, such behavior is to some extent generator of moral hazard, while creating incentives for companies with low financial discipline not to pursue structural reforms in order to improve their financial performance knowing that they can accumulate debt which at one point in time will be forgiven by the state.

Beyond the effect of these schemes, there was an extra expense to those laid down in the draft budget of about 1.6 billion lei that, although they were financed by the additional revenues from tax receipts and social security contributions, reflected a material breach of this rule. Basically, the essence of this rule is to prevent additional spending of the eventual extra revenue over the initial program, these amounts being required to be used for reducing the budgetary deficit and the public debt. This rule together with a prudent budget revenue projection in the draft budget would be likely to contribute to fiscal discipline and restrain the government's attempt to spend in excess. In conclusion, the first year when the ceiling law was operational, there were significant overruns of the spending limits, even if the budget deficit target has been reached.

For **2012**, the ceilings have been established by Law no. 291/2011 as follows: for the general government balance -17,675.2 million lei (-3% of GDP), the total expenditure net of financial assistance from the EU 203,084.2 million lei (34.48% of GDP) and for personal expenses 42500 million lei (7.2% of GDP). Even if the final execution recorded compliance with the expenditure ceilings and the one related to the budgetary balance, it should be noted that during the year, with the occasion of the budget revisions, the government increased the amount planned to be spent, violating ex-ante the rules stipulated in the ceilings law.

The final execution has not recorded overruns mainly due to the under execution of projects funded by external grants, which are included in general within investment expenditure. Basically, the ceilings law limits has not imposed firm constraints in the way in which the policy makers formulate the fiscal policy coordinates in the very first 2 years from its introduction.

For **2013**, the ceilings established by Law 4/2013 were at the following levels: -13,394 million lei (-2.1% of GDP) for the general government balance, 210,828.9 million lei (33.82%) of GDP for total expenses net of the financial assistance from the EU and other donors, 46,154 million lei (7.4% of GDP) for personnel expenses. The budgetary execution for the year 2013 did not confirm the compliance with the rules for all the indicators considered. Thus, although the total expenditure ceiling was observed (level of expenditures net of the financial assistance from the EU and other donors of 206,704.8 million lei), in the conditions of a significant failure in terms of budget revenues compared to the initial program, which was compensated only in part by reducing spending, the budgetary deficit target was missed by 2,377.3 million lei (recording a level of 2.51% of GDP), its failure representing a first since the introduction of the Fiscal Responsibility Law no. 69/2010. Also, personal spending ceiling was exceeded in nominal terms by about 144 million lei, but the overrun as a percentage of GDP was not observed (7.37% against a 7.4% limit considered) but this was due only to a better than expected nominal GDP.

It is worth noting that although both real growth and nominal GDP stood at a higher level compared to the projections, the budgetary revenues have underperformed massively, even to the initial program; this can be explained by a combination of the additional growth coming from economic sectors like agriculture which are weakly taxed and on the demand side mainly from exports and also a reduction in the collection efficiency. This proves once again the importance of the caution imposed by the ceilings law, given that it cannot be ruled out that revenue, despite a conservative estimate based on the projected dynamics for the relevant macroeconomic bases and the known elasticities, to stand at a level lower than in the draft budget. In conclusion, neither in this third year during which the law was operational, it did not exert serious constraints on the fiscal policy makers.

In **2014** the ceilings were established by Law no. 355/2014 at the following levels: for the general government balance -14,710 million lei (2.2% of GDP), for the total expenses net of financial assistance from the EU 21,662.2 million lei (or 32.4% of GDP), for personnel expenditure 48,006.1 (or 7, 3% of GDP).

The final execution showed a non-compliance with the staff costs limits, the negative gap versus the limit being 2,241 million lei or 0.24% of GDP. It is true that this excess was only due to the decision to pay in advance part of the installments for the years 2016 and 2017 related to salary rights for certain state employees established by court decisions. Basically, the overruns were not caused by fundamental factors such as the actual increase in public sector wages and could pass as a justified exception. However, compliance with the ceilings law could have been met through better budgetary programming, namely by anticipating more precisely the amounts to be paid in a year, given the fiscal space available.

Beyond the apparent compliance with the limits imposed by ceilings law for the budgetary execution for 2014, it should be noted that during that year were operated three budget amendments that anticipated breach of the limits set by law both for staff costs and for the total expenditure. The compliance with the limits occurred only as a result of the massive failure of investment spending, particularly those funded by external grants and not as a result of an improved budgetary discipline.

Table 1

The compliance with the fiscal rules in Romania in the 2011-2014 period

Fiscal Rules			The general consolidated budget balance and personnel expenditure rule		The primary balance rule	The total expenditure rule	
			mn. lei	%GDP	mn. lei	mn. lei	%GDP
2011	**GCB**	**Ceiling (Law 275/2010)**	-23,953.40	-4.40	-14,452.90	194,419.00	35.71
		Execution	-23,836.70	-4.12	-15,016.20	198,529.00	34.31
			Yes	**Yes**	**No**	**No**	**Yes**
	Personnel Expenditure	**Ceiling (Law 275/2010)**	40,574.00	7.45			
		Execution	38,496.00	6.65			
			Yes	**Yes**			
2012	**GCB**	**Ceiling (Law 291/2011)**	-17,675.20	-3.00	-7,564.80	203,084.20	34.48
		Execution	-14,774.10	-2.51	-4,063.00	199,500.50	33.96
			Yes	**Yes**	**Yes**	**Yes**	**Yes**
	Personnel Expenditure	**Ceiling (Law 291/2011)**	42,500.00	7.20			
		Execution	40,798.80	6.94			
			Yes	**Yes**			
2013	**GCB**	**Ceiling (Law 4/2013)**	-13,394.00	-2.10	-2,011.00	210,828.90	33.82
		Execution	-15,771.30	-2.51	-5,015.10	206,704.80	32.88
			No	**No**	**No**	**Yes**	**Yes**
	Personnel Expenditure	**Ceiling (Law 4/2013)**	46,154.00	7.40			
		Execution	46,298.60	7.37			
			No	**Yes**			
2014	**GCB**	**Ceiling (Law 355/2013)**	-14,710.00	-2.20	-3,486.50	216,662.20	32.40
		Execution	-12,493.20	-1.87	-2,294.00	215,137.90	30.52
			Yes	**Yes**	**Yes**	**Yes**	**Yes**
	Personnel Expenditure	**Ceiling (Law 355/2013)**	48,006.10	7.30			
		Execution	50,246.90	7.54			
			No	**No**			

Source: Ministry of Public Finance, own calculations

5. Conclusions and implications for policy makers

Concluding, the national rules introduced by the Fiscal Responsibility Law no. 69/2010 exerted a weak constraint on the decision makers in formulating the fiscal policy coordinates. Given that the efficiency of a fiscal rule is given largely by its ability to limit the discretion of policy makers, it can be concluded that the efficiency of the newly introduced fiscal rules in Romania was minimal. The expenditure ceilings related to the second budgetary year covered by them expressed as a percentage of GDP have been ineffective by construction since they can be reviewed annually. As regards the expenditure ceilings for the next budgetary year, both in nominal terms and as a percentage of GDP, they had a low efficiency, as they were often violated and only in a single year (2012) from the period 2011-2014 the ex-post compliance was observed. Moreover, even in that particular year, although the budgetary execution marked the compliance with the ceilings established by law, on the occasions of the budget amendments decided during that year, a breach of the rules of envisaged and only some particular circumstances lead to expenditures lower than the initial ceilings. The way the fiscal rules were circumvented was represented by the recourse to derogation from the provisions of the Fiscal Responsibility Law no. 69/2010, a situation that was favored by the lower legislative level of this law, respectively an ordinary law. Clearly, the ceilings law exerts particularly weak constraints over the behavior of policy makers and it has failed to fulfill its role of preventing the discretionary behavior and anchoring the expectations of economic agents. However, the rules stipulated by the ceilings law can be divided into two categories: relatively stronger rules, such as the rule related to the budget deficit that was broken only once, namely in 2013, and even then there are some specific circumstances determined by the need of support from own funds the expenditure programs from EU funds given that reimbursements from the EU were temporarily suspended, that really guides the coordinates of the fiscal policy and weak rules, such as expenditure ceilings – on total amount or only related to staff expenses - compliance with which has not been a priority. Moreover, if the deficit target is respected, the other expenditure rules could be easily met through better budgetary programming, by example setting the personnel policy for the next year at the time of the draft budget elaboration. Also, enhancing the efficiency of the fiscal rules could be

attained by a more operational set of relevant sanctions for breaching the rules or changing the status of the Fiscal Responsibility Law in order to strengthen its juridical power, for example into an organic law.

In this context, it is imperative to reform the existing fiscal rules in Romania, especially in terms of the consequences of non-compliance with them and the possibly escape clauses in order to preserve the credibility of a rules-based fiscal framework.

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COMPLEX DECISION MAKING IN THE FINANCIAL SERVICES SECTOR – THE APPLICABILITY AND USAGE OF THE SYSTEM DYNAMICS METHOD

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Abstract

Decision-making is a fundamental component of strategic and operational management; it often requires the ability to interpret and act on feedback quickly. In this article we will look at different methods employed by financial services institutions for decision making, and in particularly we will explore the usage of the system dynamics method. System dynamics is a way of studying complex systems to understand their behavior and decisions outcomes.

In the article we will also seek to understand opportunities and barriers in the usage of system dynamics in preparing organizations to challenge and enrich their interpretation of a complex world. The article is based on primary research of current practices in the sector and interviews with ~35 subject matter experts.

Keywords: Analytical Method, Mathematical Models, Optimization, Simulation, Interpretation, Decision Making, Feedback Systems, Systemic Correlations, Managerial Methodology

JEL Classification: C61, G20, C81

1. Introduction

Strategic and operational management is an essential component in achieving the strategic objectives of the organization. Currently, the modern manager's toolkit includes a significant number of techniques and management analyses that support decision making. As methods evolve and become more refined, they increasingly generate more interest from various companies that are looking for new ways to increase service quality and customer satisfaction, reduce costs, and streamline processes.

Strategic and operational management have clear key objectives. For strategic management, the main objectives are

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determining the optimal market strategy (including target customer segments, pricing, and entering new markets), resource allocation, and increasing the adaptability of the organization; for operational management, key objectives include increasing operational efficiency, reducing waste, and increasing quality of outputs, as well as the alignment of operational processes and decisions with the organization's strategic objectives.

There are numerous methods and methodologies to support the decision-making processes. Initially, these were focused on improvement of operational processes. During late 1800s and early 1900s, much attention was focused on scientific management, which involved developing methods to analyze and solve production problems, often based on time trials (Nadia Buhuiyan, Amit Bagel – An overview of continuous process improvement, 2005). The continuous improvement methods, including statistical analysis, started to be often included in programs of national interest aimed to enhance output, with experts like Frederick Taylor, Henry Grant, and Frank and Lillian Gilbert considered to be some of the founders of modern management. The early assembly line principles developed by Henry Ford were built upon in the 1950s, when Toyota implemented the Quality Circles, aimed at efficient production systems and elimination of waste. From a strategic analysis perspective, starting with the 1960s several new methods and frameworks have been developed, either at prestigious universities, such as the SWOT analysis developed at Harvard (this framework supports the analysis of a company through the perspective of its specific Strengths, Weaknesses, Opportunities and Threats), or by management consultants, such as Porter's Five Forces (which identifies the forces which form a competitive environment), developed by Michael Porter of The Monitor Group, and the Experience curve developed by the Boston Consulting Group (this refers to the hypothesis that for any company the unit cost decreases significantly by 15-25% for each doubling of the cumulative production).

Later on in the late 1980s, the focus on operational efficiency has been furthered through extensive focus on lean manufacturing, eliminating everything that does not add value to a process, and increasing adaptability of an organization through elimination of waste.

Although initially these methods were applied especially in the production sector, recently they extended their application in the financial sector. The financial crisis of 2007-2008 resulted in an increased concern of banks to reduce their costs and maintain profitability, bringing back to the forefront the concern for efficient operational management. The largest banks in the world have successfully implemented Six Sigma methods and reengineering processes (Ayesha Khanna, "Straight-through Processing for Financial Services – The Complete Guide", 2008), achieving significant cost reductions – often, the engineering efforts are attributed an impact of hundreds of millions of US dollars. Moreover, the financial crisis demonstrated the inter-connectivity and vulnerability of the financial system resulting from this interdependence, complexity and intensity of ties between participants.

The large number of participants in financial processes and distribution of risks, as well as the interdependencies between them through complex transactions in a large number of markets and jurisdiction, result the banking sector being highly complex. Moreover, each organization is a complex system in itself, with many components and interactions which often cannot be anticipated by simply analyzing isolated factors of influence. Traditional tools methods of analysis – both in support of strategic as well as of operational management - are focused primarily on linear analyses (e.g., cause-and-effect). For example, operational process analysis is often limited to the analysis of various process steps and their failures without specifically analyzing the interaction between various process parameters.

The complex nature of organizations and the environment in which they operate bring to the fore the need for a different analysis method, with focus on fundamental understanding of all components of the organization and the environment in which it operates. Only when the systemic aspects are deeply understood one can determine what must be done to achieve long-lasting improvements.

2. Complex decision making in the financial services sector

A systemic approach includes the analysis of feedback systems and is focused on finding solutions that suit the environment in which the organization operates and identifying interdependencies between different parameters and their interaction with the

environment. The ability to recognize feedback systems within an organization - although simple in concept - represents a major departure from the linear approach and gives us a different way to interpret the economic and social environment (Jay W. Forrester, Senior Lecturer at Sloan School of Management Massachusetts Institute of Technology, System Dynamics and the Lessons of 35 Years, 1991).

The system dynamics method is a scientific approach to studying the behavior of complex systems over time. The approach aims to understand the behavior of complex systems over relatively extended periods of time, demonstrating that even the simplest systems have a non-linear behavior. The method includes an analysis of feedback loops, using the "accumulation" and "flows" between various parameters, and provides the ability to predict possible outcomes of decisions (John D. Sterman, Business Dynamics – Systems Thinking and Modeling for a Complex World, 2000). A traditional analysis process, such as the linear-type approach, enables us to identify simple loops; however, as the distance between cause and effect is greater in time and space, the consequences of previous decisions become more difficult to identify, as they are directly correlated with the accumulation of experience and refining future decisions (John D. W. Morecroft, Strategic Modelling and Business Dynamics, "A feedback systems approach", 2010).

Systemic dynamics is not a new approach, but its use in financial services, in the context of understanding systemic impact (e.g., risk) is limited, although recent events (such as the financial crisis) demonstrate the need to better understand how organizations are connected to the environment they operate in. According to Deming (in the "System of Profound Knowledge", 1993), only when systemic issues are deeply understood, one can determine what needs to be done to achieve lasting improvements in quality and efficiency. Organizations run by people who are guided by "profound knowledge system" are much more likely to succeed and be effective. Deming is among the most recent world-renowned experts who support the introduction of a systemic approach in answering management questions.

Surprisingly, system dynamics is studied and applied in a limited fashion. Since being developed at the Massachusetts Institute of Technology ("MIT") in Cambridge, Massachusetts by the renowned professor Jay Forrester, the method has been mostly applied to

understand public policy issues and predict possible outcomes and unintended consequences; it also has been applied to operational problems, such as production management. Currently, in the US system dynamics is included in the curricula of very few universities (however, the method continues to hold a prominent place in the curriculum at MIT).

This method has particular relevance for the financial sector. Due to the complexity of the financial system and its predominantly silo-ed approach, and due to the risks involved, a systems dynamics approach can fulfill a key role in strategic, organizational, and operational management. This topic is particularly relevant in the current context, where financial services companies that were shaken by the financial and economic crisis, are now faced with increasing pressure on costs, and at the same time with the requirements of increasingly sophisticated customers, who do not want any compromise in quality. In addition, the degree of innovation has significantly increased in recent years, propelled by numerous advances in technology. This implies the need for a higher understanding of the financial ecosystem, the role that organizations play within the ecosystem, and the growth opportunities in a new market context. System dynamics can provide significant opportunities in determining optimal positioning strategies to attract new customers.

3. The applicability and opportunity of using the system dynamics method

However, the system dynamics method is not much used in the financial sector. Interestingly, the System Dynamics Society, which maintains a repository of case studies of its application across different domains, only has one existing case study, which is focused mostly on policy.

In order to explore the degree of relevance, current application, and opportunities and barriers for the usage of this method, a primary research was undertaken, including interviews and surveys with 35 international specialists with experience in the financial services sector, some of which had specific experience with the application of system dynamics.

4. Research methodology

In order to obtain the perspectives of experts, research activity has included extensive data collection and analysis (interviews and

surveys conducted with experts). The objective of this research was to obtain different perspectives on the applicability and use of this method in finance and the opportunities and limitations of these methods. Specifically, this analysis had as main objective to identify the following:

- Degree of application of the system dynamics method in the financial services sector, and the degree of its maturity of its usage;
- The type of problems that this method can solve for;
- Areas where this method is most relevant, and potential beneficiaries of this method;
- Possible benefits of using this method;
- Possible limitations on the use of this method;
- Trends in the use of this method in future;
- Factors that may positively or negatively influence the applicability of this method.

Among the experts interviewed, 90.4% had experience in financial services. We included specialists with different levels of experience to provide different perspectives. Over 70% of interviewed specialists have direct experience in strategy and operations; 66% of specialists have direct experience in management. We provided an overview of system dynamics to all specialists, which included definitions of the method and key components, discussion of objectives and features, and illustrative examples.

5. Interview results

Interviews with specialists in the field identified the high applicability of this method, especially as support for operational decisions. Identified key benefits of using this method included: further understanding of system behavior, identifying the necessary corrective actions, and contributing to the strategic alignment of various decision makers. In particular, specialists *anticipate significant growth in the use of system dynamics* as method of study – the vast majority (90.9%) estimating an increase in the use of this method in the financial services sector. An increased degree of adoption, according to experts, is influenced primarily by the fact that organizations are becoming increasingly complex and we need specific tools to understand them; also, the degree of adoption is also dependent on the availability of data and an increased interest in the use of new modeling methods.

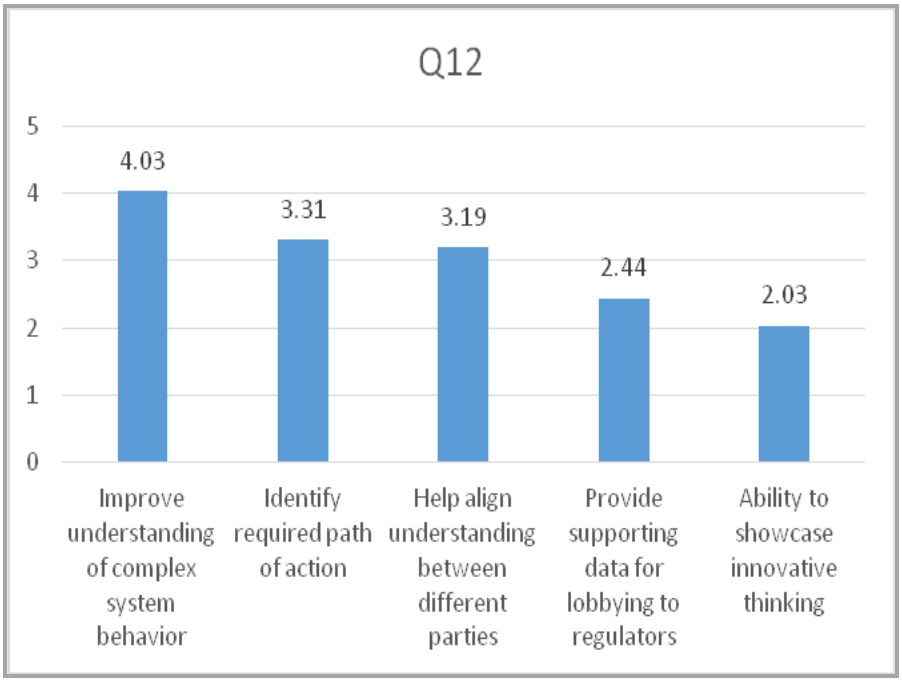
A key observation was the unanimous appreciation of specialists who have used *this method* that its use has *brought the answer to the question/ problem addressed*. However, a significant subset of respondents noted that *this method has identified new areas for exploration*. This is a typical feature of management analysis methods that identify new questions and directions of exploration, without giving false confidence in achieving "absolute truth". Interestingly, of the experts interviewed, the vast majority (92%) consider that this method is beneficial and recommended its usage. The most commonly identified benefit was *the method's contribution to the strategic alignment of various decision factors enabling a deeper understanding of the system in study*.

Subsequently, the experts were asked to provide insight on *decision makers that could benefit most from the usage of this analysis method*. The overwhelming response was in favor of the Chief Operating Officer – chosen by 89% of respondents as the main beneficiary of this method. This is a logical correlation with specialists' perspective that this method has significant benefits in the operations management space. The next beneficiaries identified are the regulators (identified by 60% of respondents), followed by the "Chief Executive Officer" and the "Chief Financial Officer" (both identified by 57% of respondents). Another benefit identified is the *ability to demonstrate innovative thinking*, which is becoming an increasingly important focus in the financial sector in today's environment, faced with significant competition, including competition from non-traditional players (e.g. the "fin-tech"[1] companies).

[1] *The word comes from the combination of „financial" si „technology" and refers to new companies which leverage new available technologies and apply them in the financial services sector (e.g. mobile to mobile payments with no bank accounts required)*

Figure 1

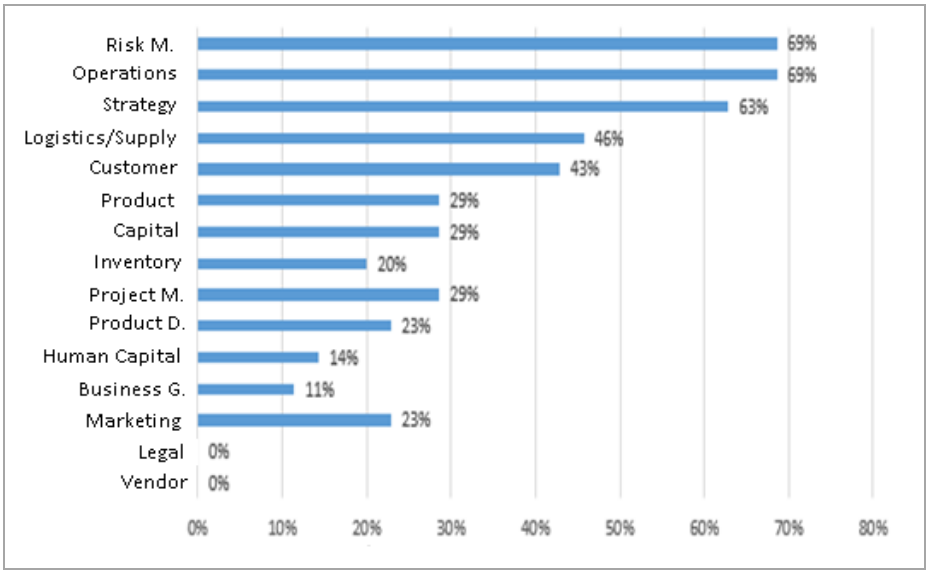
Details related to the perspectives of the experts interviewed on the benefits of using the system dynamics in the financial sector



Experts were also asked what types of problems can benefit most from the application of this method. Risk management, operational and strategic issues, and consumer analysis were most selected. These selections are in line with the traditional use this method – mainly for management to identify possible future scenarios and therefore determine measures to reduce the risk in various unfavorable scenarios.

Figure 2

Areas/Types of problems that mostly benefit from using the system dynamics method in the financial sector



Notes: M. = Management; D. = Distribution; G. = Governance

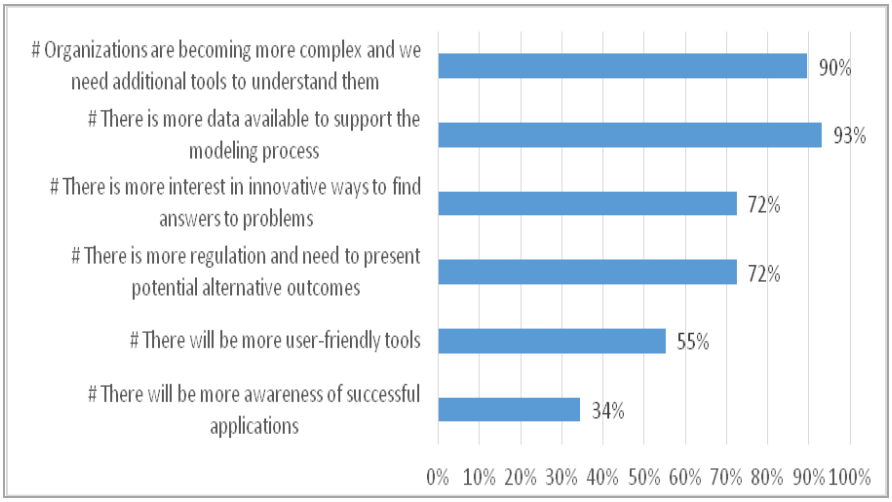
The experts were also asked to provide insight on expected evolution of applying system dynamics in the financial sector – namely, whether its utilization will increase in future. The vast majority (90.9%) expected to see an increase in its use – we next analyzed their perspectives on factors that will influence this higher degree of adoption.

Scientists have been invited to provide insights on the importance of six factors considered in our research, as well as to provide additional options on other factors of influence. One of the key factors identified was that organizations are becoming increasingly complex, and managers need new methodologies targeted to specific levels of complexity in order to understand them.

Additional factors mentioned included the fact that data availability is much higher nowadays, that there is growing interest in the marketplace in using new methods of modeling, and that there are now more innovative ways of finding answers to current problems.

Figure 3

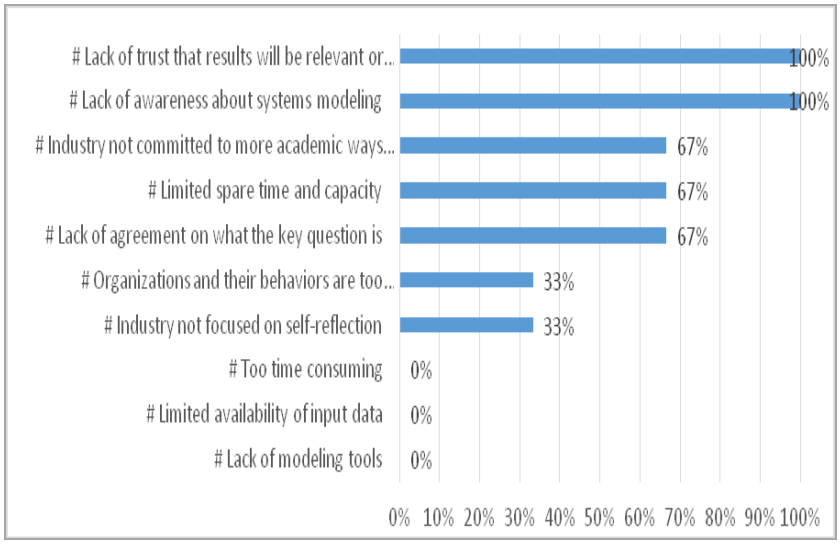
Perspectives on factors that will influence the increased use of system dynamics method in the financial sector



Also, the experts were asked to provide their perspective on potential barriers to increasing the adoption of this method. 100% of respondents identified lack of trust that the results obtained may be used for decision-making, and lack of information about this method as the main barriers. Very interesting is the large number of experts who believe that often, it is difficult to come to consensus on what the problem is to be solved. Indeed, this is one of the barriers often mentioned by those who are experienced in applying this methodology, often identifying a lack of common understanding of the problem as a major factor in delays in the planning phase. It is also interesting to note that none of the experts identified as barriers the lack of modeling tools or the availability of input data.

Figure 4

Perspectives on barriers that limit will increase the use of this method in the financial sector



4. Conclusions

The existing analysis and decision support methods for strategic and operational management were the foundation and starting point of this work. Building on this foundation, this research explored the opportunity of applying a new method in the financial sector through the analysis of the perspectives of 35 international specialists on the applicability of the method and the possible benefits, potential barriers and opportunities in its application in the financial sector.

In summary, system dynamics has broad application potential - both at the microeconomic and macroeconomic levels. As organizations and the environment in which they operate become more complex, increasing regulatory requirements, customer needs and expectations of shareholders to obtain increased financial performance put significant pressure on management.

The system dynamics method, focusing on the fundamental understanding of the main components of a system, provides particularly relevant instruments for the current problems of the financial system. The method also facilitates the identification of

correlations and interdependencies between the organization and the environment in which they operate, facilitating management analysis and identification of optimal decisions and trade-offs, in the context of a specific macroeconomic environment. For example, in the absence of a systemic approach, process analysis remains an isolated (Jörg Becker, Martin Kugeler si Michael Rosemann: "Process Management", 2011), linear exercise that often ignores critical systemic elements that are essential in decision making. Even a conceptual system dynamics analysis, without the development of a model, offers a new perspective on the critical factors of influence in a system. The application of the system dynamics method enables a deep understanding of the behavior of an organization and the ecosystem in which it operates.

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