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Empirical Investigation of Systemic Risk in the New EU States

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Abstract

Sovereign CDS spreads have become major variables focused on risks and expectations about the fiscal situation of different countries. In the paper we investigate, first, whether there is a link in the new member states between the expectations about the condition of their public finances and the dynamics of money markets, including integration of national money markets with the Euro area. Second, we look on the particularities of this relationship through the different phases of the crisis and across the different countries using different monetary regimes. This concerns mostly two opposite extreme monetary regimes, namely, currency boards (and quasi-fixed exchange rate) - Bulgaria, Estonia, Latvia, Lithuania, or inflation targeting - Poland, Czech Republic, Hungary and Romania. The results obtained form the high frequency panel data models support the theoretical hypotheses and policy intuition that exists strong relationship between the liquidity risk (measured by the short term money markets) and fiscal risk (measured by CDS) and that this link is extremely unstable and in some sense nonlinear during the financial crisis. Our study confirm that the strong link between monetary and public finance risk as apart of total systemic risk increase during the crisis especially for currency boards regimes, when the link becomes stronger and pronounced. For the inflation targeting countries the link became weaker and less pronounced.

1. Introduction

The crisis placed again in the center of attention on the EU stability and expansion of the euro area, on monetary and fiscal integration of new countries and their resistance to various types of shocks.

In the few years before the onset of the crisis, the EU enlargement moved without significant disruptions and according to the institutional framework needed for the next step - the enlargement of the euro zone. The main theoretical discussion was limited generally to the question of how different types of monetary and exchange rates regimes would be able to fulfill criteria for nominal and real convergence and protect against asymmetric shocks. As a rule, the monetary policies of the NMS closely followed the ECB policy, either in the discretionary regime (inflation targeting), or passively (currency board or quasi fixed exchange rate). The convergence of monetary variables, particularly interest rates was relatively well developed, and generally satisfactory nominal integration was observed. This concerned especially the interbank money market, which is not only a key element in the transmission of monetary policy, but also serves as an indicator for the liquidity stance, for interbank risk and for overall confidence in the banking system.

Current crisis that started during the 2007 has gone through two phases, which are reflected on the NMS, especially after September 2008 (Gardo and Martin, 2010). When the first phase of the crisis focused primarily on the interbank market volatility, the second phase spreads on the instability of public finance. Although the overall stance of public finance of the new members is better than that of old member countries, the differences within the new group are significant (from the performer Estonia to the laggard Hungary). In this second phase, sovereign CDS spreads have become a major variable for observation, focused on risks and expectations of the fiscal situation of different countries.

Several interesting theoretical and practical issues appear. The first one is, whether there is a link in the NMS between expectations of the condition of the public finance and the dynamics of money markets, including integration of their money markets with the euro area. This means investigating the link between fiscal and liquidity risks as major components of systemic risk, or in other words – examining the correlation between the macro (public), and micro (bank) dimensions of the systemic risk. Second, how the above link, if it exists and a priori it should exist, will be developed in time and in different phases of a crisis and how it evolves according to different country monetary regimes. This concerns mostly two opposite extreme monetary regimes, namely, currency boards (and quasi-fixed exchange rate) - Bulgaria, Estonia, Latvia, Lithuania, Croatia, or inflation targeting - Poland, Czech Republic, Hungary and Romania. Thus, our study is comparative in nature and allows opposing various monetary and exchange rate regimes[1].

The rest of the paper is organized as follows. Section 2 presents the theoretical motivations and objectives of this study. Section 3 briefly presents a literature review on the subject. Section 4 presents the data and empirical methodology. Empirical findings are discussed in section 5. Section 6 stresses some limitations of the present study and presents some possible extensions.

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[1] For details see review articles of Ball (2010) and Frankel (2010), and for Eastern Europe see Gardo and Martin (2010).

2. Theoretical Motivation: Integration of Money Markets and Fiscal Risks

In the current global and European crisis several phases have emerged, two of them are of particular importance. The first one is money market crisis when confidence between banks ultimately led to deep changes in the principles and techniques of central bank monetary policies (quantitative easing, non-standard measures, abandonment of the so called separation principle etc...). The second phase concerns the crisis of public finance and public debt, which appears later and had largely cumulative result of massive fiscal stimulus taken at the outset and designed to help the banking sector and to compensate for the ineffectiveness of monetary measures[2].

In the first phase the attention of investors, bankers, and businesses interested in European economy was nailed on the state of money market, although a theoretical perspective, such markets have been in some respects forgotten and unexplored (Holthausen and Pill (2010)[3]. After a long period of convergence and stability these markets started to experience sharp fluctuations (mainly increases) and pronounced divergence of national interest rates dynamics[4]. Short-term interest rates (unsecured overnight interest rates, and 3 months rates) were of particular importance because they reflect not only changes in short-term liquidity of the banking sector, but also confidence in the banking system as a whole. Short term interest rates are closely related to the formation of a term structure of the yield curve, indicator of current and anticipated economic development, and they represented a major signal for future interventions by central banks. On the graphs 1 and 2 are presented respectively the overnight interest rate dynamics and 3-month money market rate dynamics, compared to the ECB credit and deposit facilities interest rates.

Graph 1: Dynamics of overnight interest rates in New Member States

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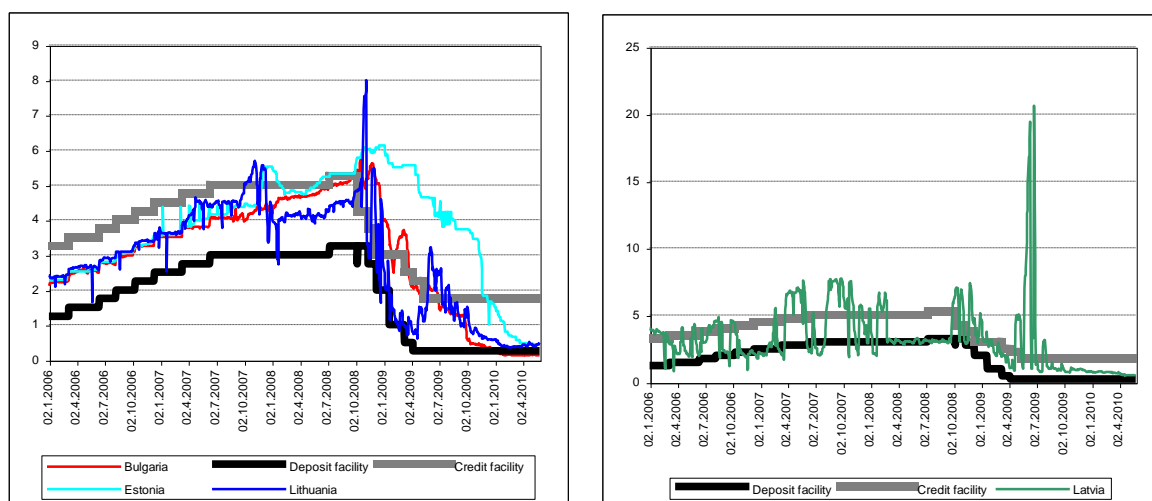
[2] See details for BNB (2010), ECB, (2010), Berglof and al. (2009), Gardo and Martin (2010), Cerisier (2010), Bordes and Clerc (2010).

[3] According to Di Fiore and Tristani (2010, p. 10): "Some of the links between financial markets and the macroeconomy remain imperfectly understood, notably the link between interbank markets and aggregate economic dynamics".

[4] Key turning points were in August 2007 and September 2008, when they were coordinated and sharply reduced key interest rates of leading central banks to arrive in June 2009 when the ECB injected a huge amount of 442 billion euros.
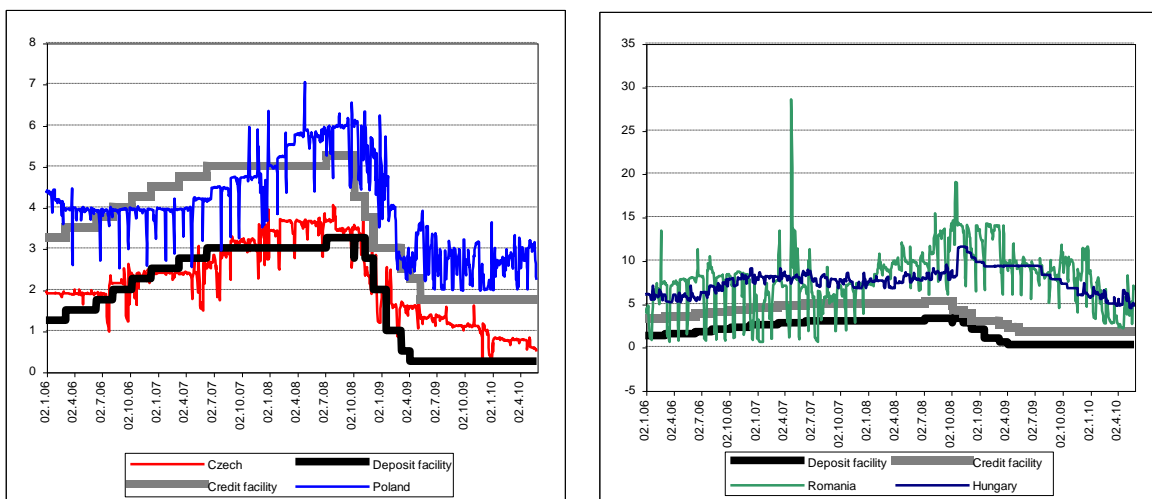
Graph 2: Dynamics of 3 months interest rates in new member states
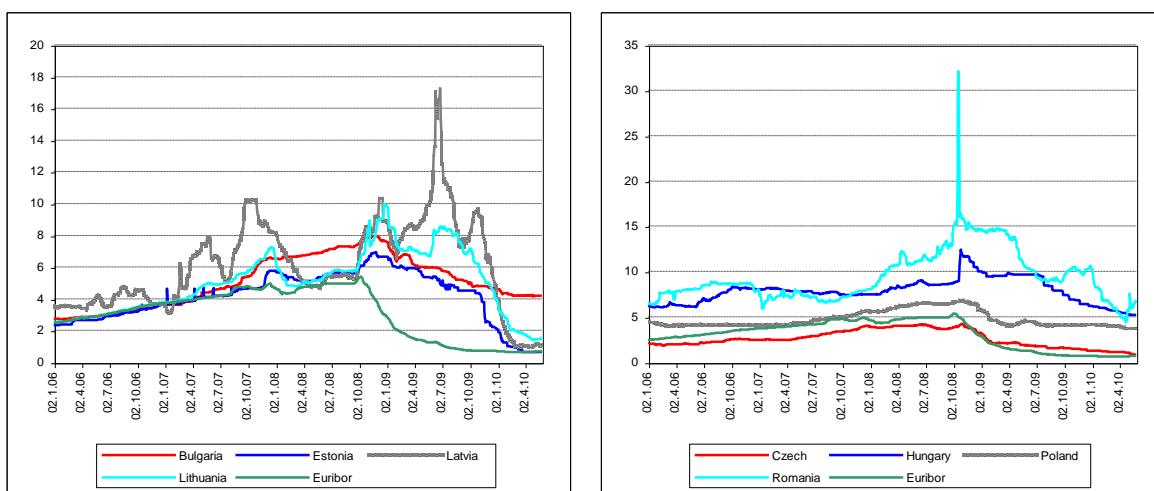
As to the second phase of the crisis, the attention of investors, bankers and politicians was focused on different indicators for fiscal risks (default, payment arrears on sovereign bonds, etc.), including spreads of CDS[5] which highs reached in March 2009 and mid-April 2010 (see graph 3). When the interest spreads in the interbank market, showing the state of confidence in the banking system and micro-level risks, CDS is indicator for the confidence on the sustainability of fiscal and debt policy, i.e. macro-risks.

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[5] The market for CDS (credit default swap) as part of the market in credit derivatives has grown particularly rapidly during the last decade, resulting in standardized and certain technical innovations which continue today, see for details (Packer and Suthiphongcahi, 2003; ICE , 2010).

Graph 3: Dynamics of the CDS to the new member states
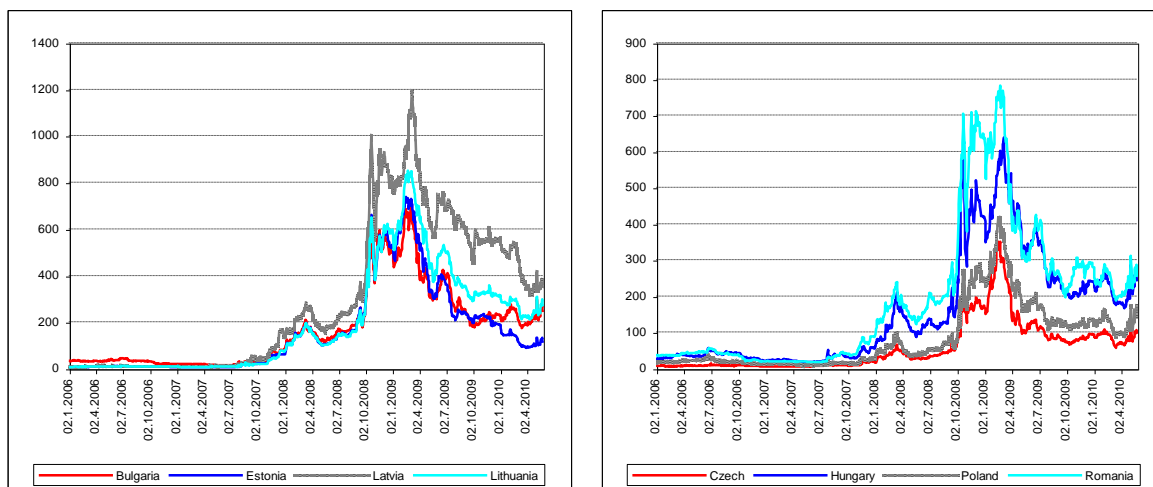
There is no doubt that different links exit between the state of confidence in the interbank market and confidence in public finance as integral parts of systemic risk and financial stability.

First, the impact of fiscal risks on the money market going through changes in bank balance sheets where sovereign securities are presented. Any worsening of expectations of a moratorium or debt restructurings is automatically reflected in the state of the banking system, the CDS of individual banks is rising, and hence in the price of money market.

Second, opposite influence exists, from money market interest rates to fiscal imbalances, and is expressed primarily by the fact that the government is the guaranty of the stability of the banking sector, evidenced by a series of measures of bank capitalization and restructuring. Thus, any disturbance of the money market and more expensive resources, lead to accumulation of costs for the budget and ultimately worsen the solvency of governments.

In the NMS, the links already mentioned are interwoven theoretical and practical problems associated with the dynamics of convergence and comparative effectiveness of different monetary regimes.

First, as mentioned in the introduction, before the crisis the main issue for the comparative analysis concerned the choice of monetary and currency exchange regimes for achieving monetary and real convergence. Monetary convergence, i.e. similar movement of interest rates with that in the euro area members was considered and is still considered as a minimum requirement for a successful adoption of the common monetary policy. In this sense, the interest rate channel and inter-bank interest rates are leading links in the chain of transmission mechanism. Crises change things or at least put them in new conditions. It not only cast doubt on the sustainability of the trend towards monetary integration in the NMS, but also gave impetus to the destruction of the monolithic behavior of the new countries, allowing identifying different individual trajectories, depending on the state of public finance, banking systems, and overall structural reforms. Roughly crises gave a new opportunity for expression of the diversity of transition, which has long been subject to thorough analysis and numerous publications[6].

Second, the dynamic of monetary convergence especially that of the interbank market, considered within the broader discussion on optimality of the European currency zone, allows

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[6] See Kornai (2000), Aslund (2002), Colombatto (2002), Winiecki (2004), Csaba (2009), Bohle and Greskovits (2007), Havrylyshin (2009) and others.

the benchmarking of monetary regimes performance in the NMS. This concerns the current state of the almost bipolar choice of monetary regimes, on the one side currency boards and quasi-fixed rates in Estonia, Latvia, Lithuania and Bulgaria and on the other side inflation targeting and floating rates in the Czech Republic, Hungary, Poland and Romania[7]. The bipolar situation provides opportunities for almost a natural experiment for the success of the two different monetary systems[8]. In fact this polarity was reached through a long evolution, in which stood out different trends and groupings (Nenovsky, 2009).

Third, disputes between supporters of the CBA and inflation targeting in post-communist countries have a long history, which acquires real practical terms. It is generally believed that currency boards give greater opportunities for rapid monetary integration, because the interest rates passively follow the euro area, due to the effects of credibility and discipline[9]. Credibility and discipline effects provide an opportunity for a tight fiscal policy and low public debt[10]. For its part, proponents of inflation targeting indicate that this arrangement allows for greater autonomy and monetary response to asymmetric shocks, and that the Currency boards are highly vulnerable. According to them, the effects of credibility and discipline are not weaker under the regime of monetary discretion than under the rigid monetary rule. Experience shows, however, that the state of the MNS and certain preconditions for the integration of the euro area, the opportunities for independent monetary policy are small and almost insignificant. This is confirmed by the behavior of interest rates before the start of the crisis, which had similar convergence dynamics.

3. Related Studies

For the purposes of empirical measurement general theoretical relationship between bank and fiscal risks is limited to an analysis of the relationship between short-term interest rates on money market (overnight interest rates and three-month interest rates) and spreads on sovereign CDS premiums in different phases of the crisis, as well as two main monetary regime. Countries are examined in two groups, four with fixed exchange rates and four with inflation targeting. The first group included, the Baltic countries at the beginning of 90 years chose a fixed exchange rate regime (Estonia, 1992, Latvia 1993, Lithuania, 1994) associated with geo-strategic choice for separation from the Soviet zone and monetary integration in the European system. They add Bulgaria which, in 1997, introduced a currency board. The second group of countries is that where inflation targeting is selected. Here are the countries of Central Europe (Czech Republic, 1998, Poland, 2000, Hungary, 2001) and Romania (2005).

Several studies may be useful for our analysis, although most of them did not deal with or directly tested the dependencies tested in the current research. The dynamics of the whole multitude of interest rates in new member states has been studied thoroughly and in detail by Egert and al. (2007) in connection with problems of interest rate pass through in 5 countries

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[7] Slovakia and Slovenia are not subject to analysis; they are full members of the eurozone.

[8] See e.g. the discussion about the comparative success of different countries in combating the crisis made in Aslund (2009) and Gardo and Martin (2010). Aslund said the main reason for the crisis is the course currency regime and the crisis is particularly serious where the scheme is rigid (currency boards) and relatively mild pass to inflation targeting. Although Aslund's theoretical considerations are interesting, the facts, however, do not confirm his claim, they are even opposite. Telling evidence is the comparative situation of Estonia and Hungary, considered the first member of the eurozone by 2011, and the second - the boundaries of financial collapse.

[9] See for the functioning of currency boards. Nenovsky and Hristov (2002), Nenovsky, Hristov and Mihaylov (2002).

[10] Although the general practice confirms these relationships, real situation with currency boards are more complex and the trajectories of the two effects (credibility and discipline) are complex and nonlinear dynamics (Raybaut and Torre, 2005).

of Central Europe, and Cuaresma and Wojcik (2006) to measure the monetary independence of Hungary, Poland and Czechoslovakia, in different periods of exchange rate regimes (1993-2003). Using DCC-MGARCH modeling in the second study the authors found confirmation of the hypothesis of greater independence at a floating rate and more in fixed. At the same bed and same parties is the study of Habib (2002), which concentrates on short-term interest rates, and finds a lack of dependence with interest rates in Germany.

As for NMS sovereign CDS spreads lack independent studies of their dynamics. Indeed, the attention of researchers on the behavior of the CDS spreads is recent, and directions for future research are numerous. Several authors establish empirically that these spreads reflect quite well the state of fiscal risks and in a sense give more and better information than sovereign ratings (Shino and Takahashi, 2010). These authors suggest that the relationship between CDS spreads and public debt was especially shown for the countries of Southern Europe (Greece, Portugal, Spain, and Italy). For its part Ismailescu and Kazemi (2010) examined the response of the CDS spreads in emerging markets in terms of changes in ratings during 2001-2008 and found that positive changes in ratings have a stronger effect on CDS than negative changes. An interesting empirical analysis of shocks on the return of bank assets of major U.S. and European banks caused by the bank CDS indices is represented in Calice and Ioannidis (2011).

As for modeling of overnight interest rates, it has a long tradition (Hamilton, 1996; Hamilton and Jorda, 2002) and is subject to numerous and interesting attempts to account a number of institutional and organizational factors in the EU money market (Nautz and Offermanns, 2006; Bartolini and Prati, 2006; Cassola and Mmorana, 2008; Linzert and Schmidt, 2008), and the effects of the crisis Holthausen and Pill (2010). Modeling of overnight interest rates under a Currency board, in the case of Bulgaria was made by Nenovsky and Chobanov (2004).

4. Data and Empirical Methodology

The main novelty of the present study is to investigate the direct link between monetary and liquidity risk from one side and fiscal and country risk from the other side. Our empirical strategy is to run the panel models, linking overnight interest rate and sovereign CDS spreads of new member states (taken either as level, or deviation from European level). The original database we use includes daily observations for short-term interest rates and sovereign CDS rates for the period January, 2006, to June 2010, eighth countries (Estonia, Latvia, Lithuania, Bulgaria, Poland, Hungary, Czech Republic and Romania) for Eonia (Euro Overnight Index Average) and 3-month Euribor (Euro Interbank Offered Rate), and sovereign CDS for Germany. We run the panel firstly for the entire period, and later we split the period into two parts, prior to the crisis, and during the crisis.

The first group of model (equation (1) and (2) below) presents the equations of the panel model, where NMS interest rates are taken as deviation from to EU benchmark:

$$d(io_{it} - io_t^*) = \alpha_{it} + \alpha_{1i}d(i_{it} - i_t^*) + \alpha_{2i}d(i3_{it} - i3_t^*) + \alpha_{3i}d(s_{it} - s_t^*) + \varepsilon_{it} \qquad (1)$$

$$d(io_{it} - io_t^*) = \alpha_{it} + \alpha_{2i}d(i3_{it} - i3_t^*) + \alpha_{3i}d(s_{it} - s_t^*) + \varepsilon_{it} \qquad (2)$$

In equations (1) and (2) *io* denotes overnight interest rates in the new member sates and *io** - denotes Eonia, *i3* presents short 3-month rates, *i3** presents 3-month Euribor, *i* and *i** present the policy rates and finally *s* and *s** denote respectively sovereign CDS spreads to new countries and those of Germany. The subscript *i* is for country effect, and *t* – for the time

effect. The model (1) was used for countries with inflation targeting regime where the policy rate is discretionary formulated. In the case of Currency board countries (and fixers, like Latvia), there is not discretionary policy rate, and where this rate is announced it is of purely administrative, statistical and judiciary objectives, therefore the equation (1) becomes equation (2).

The second group deals with the same relation between fiscal and liquidity risk, and the variables are taken independently (not as a spread) and the EU short term rates appear as explanatory variables. In this case we run the following two panels, equation (3) for inflation targeters and equation (4) for Currency board countries:

$$d(io_{it}) = \alpha_{it} + \alpha_{1i}d(i_{it}) + \alpha_{2i}d(i3_{it}) + \alpha_{3i}d(s_{it}) + \alpha_4 d(io^*) + \alpha_5 d(i3^*) + \varepsilon_{it} \qquad (3)$$

$$d(io_{it}) = \alpha_{it} + \alpha_{2i}d(i3_{it}) + \alpha_{3i}d(s_{it}) + \alpha_4 d(io^*) + \alpha_5 d(i3^*) + \varepsilon_{it} \qquad (4)$$

The results obtained are presented in the Tables I and II.

Table I: Estimation results of models in spreads

	Entire period 06/2006:05/2010	Prior to the crisis 06/2006:09/2008	Crisis period 10/2008:05/2010
Fixed exchange rate (Bulgaria, Estonia, Lithuania, Latvia)	α=-0.0017 (-0.25) α2 =1.563 (26.84)*** α3 =0.0016 (2.72)*** R2= 0.1396 DW= 1.7792 Obs 4580	α=-0.0001 (-0.024) α2=0.6930 (9.46)*** α3 =0.00007 (0.05) R2= 0.0306 DW= 1.8792 Obs 2844	α=-0.002 (-0.16) α2 =1.8583 (19.79)*** α3 =0.0014 (1.76)* R2=0.1890 DW=1.7324 Obs 1736
Inflation targeting (Poland, Hungary, Czech Republic, Romania)	α=0.0007 (0.06) α1 =0.5512 (3.89)*** α2=0.5517 (10.19)*** α3 = -0.0007 (-0.51) R2=0.0266 DW=2.0998 Obs 4580	α=0.0012 (0.08) α1 =1.0428 (3.57)*** α2=2.6563 (10.85)*** α3 =-0.0149 (-3.17)*** R2= 0.0482 DW= 2.06 Obs 2844	α=0.0005 (0.0329) α1 =0.3377 (2.39)** α2 =0.4349 (9.11)*** α3 =0.0007 (0.59) R2=0.0507 DW= 2.26 Obs 1736
Deficits countries (Hungary, Latvia Romania)	α=0.0003 (0.02) α1 =0.2653 (1.39) α2 =0.7807 (12.21)*** α3 =0.0012 (0.90) R2=0.0430 DW=1.9854 Obs 3435	α=0.0015 (0.07) α1 =0.9919 (2.75)*** α2 =1.8876 (8.47)*** α3 =-0.0111 (-2.25)** R2=0.0389 DW=2.0225 Obs 2133	α=0.0004 (0.01) α1 =-0.0186 (-0.08) α2 =0.69 (10.10)*** α3 =0.0022 (1.57) R2=0.0747 DW=1.9593 Obs 1302

Note: This Table shows the estimation results of equations (1) and (2). *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table II: Estimation results of models in levels

	Entire period 06/2006:05/2010	Prior to the crisis 06/2006:09/2008	Crisis period 10/2008:05/2010
Fixed exchange rate (Bulgaria, Estonia, Lithuania)	α=-0.0005 (-0.19) $\alpha2$ =0.8119 (25.29)*** $\alpha3$ =0.0007 (3.26)*** $\alpha4$ =0.0462 (2.04)** $\alpha5$ =0.6247 (4.54)*** R2= 0.1720 DW= 2.0185 Obs 3435	α=0.0001 (-0.06) $\alpha2$=0.5294 (15.23)*** $\alpha3$ = -0.0004 (-0.71) $\alpha4$ = 0.0795 (3.72)*** $\alpha5$ =0.2466 (1.66)* R2= 0.1063 DW= 2.2964 Obs 2133	α=0.0102 (1.73)* $\alpha2$=0.9847 (17.67)*** $\alpha3$ =0.0007 (2.35)** $\alpha4$ =0.0069 (0.16) $\alpha5$ =1.1345 (4.13)*** R2=0.2120 DW=1.9174 Obs 1302
Inflation targeting (Poland, Hungary, Czech Republic, Romania)	α=0.006 (0.05) $\alpha1$ =0.4199 (2.55)** $\alpha2$ =0.5540 (10.26)*** $\alpha3$ =-0.0008 (-0.67) $\alpha4$ =0.0814 (0.72) $\alpha5$ =0.09 (0.13) R2=0.0251 DW=2.0992 Obs 4580	α=-0.0059 (-0.36) $\alpha1$ =0.8274 (2.48)** $\alpha2$ =2.7048 (10.95)*** $\alpha3$ =-0.0150 (-3.12)*** $\alpha4$ =0.0152 (0.09) $\alpha5$ =-0.7713 (-0.64) R2= 0.0463 DW= 2.0609 Obs 2844	α=0.0040 (0.21) $\alpha1$ =0.2277 (1.37) $\alpha2$ =0.4380 (9.21)*** $\alpha3$ =0.0003 (0.30) $\alpha4$ =0.1841 (1.36) $\alpha5$ =0.4040 (0.47) R2=0.0502 DW= 2.2632 Obs 1736
Deficits countries (Hungary, Latvia Romania)	α=0.0011 (0.06) $\alpha1$ =0.0932 (0.43) $\alpha2$ =0.7859 (12.37)*** $\alpha3$ =0.0009 (0.65) $\alpha4$ = -0.3857 (-2.28)** $\alpha5$ =1.1740 (1.14) R2=0.0449 DW=1.9819 Obs 3435	α=-0.0062 (-0.27) $\alpha1$ =0.7669 (1.92)* $\alpha2$ =1.9204 (8.61)*** $\alpha3$ =-0.0109 (-2.17)** $\alpha4$ =-0.1148 (0.48) $\alpha5$ =0.2834 (0.17) R2=0.0382 DW=2.0221 Obs 2133	α=0.0120 (0.37) $\alpha1$ =-0.1792 (-0.70) $\alpha2$ =0.6943 (10.30)*** $\alpha3$ =0.0016 (1.19) $\alpha4$ =-0.6320 (-2.64)*** $\alpha5$ =1.9381 (1.27) R2=0.0817 DW=1.9532 Obs 1302

Note: This Table shows the estimation results of equations (3) and (4). *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively

5. Discussion of the Empirical Results

According to the results we can observe that inflation targeting and pegged exchange rate NMS demonstrate significant differences in terms of monetary integration and perception of fiscal risk. Overnight interest rate spread under fixed exchange rate in normal times depends on monetary factors, mainly on expectations about future behavior of interest rates and upon an assessment of the liquidity situation presented by the three-month spread. In the same period for inflation targeting countries the spread in policy rates and CDS are significant factors. The relationship between policy rate and overnight has the expected positive sign. The relationship with CDS is negative, which at first glance does not confirm the theoretical assumption of the link between the monetary and fiscal risk. In fact, the pre-crisis period is characterized by a cycle of rising interest rates by the ECB, accompanied by plenty of liquidity for countries with inflation targeting. Moreover, when the attempts to tighten monetary policy were observed, this is not the case in respect of the fiscal efforts. There were budget deficits regardless of the upward phase of the cycle. Pro-cyclical fiscal policy is not always reflected by an adequate change of the CDS spread due to high economic growth and the underestimation of the inherent risks. Therefore, both risks - monetary and fiscal - move together.

Some of the NMS are characterized by high volatility in their monetary variables, high budget deficits, and vulnerability to shocks that force them to seek assistance from IMF and EU. Due to similarities in their behavior we gathered them into a third group called "deficit countries". Before the crisis the behavior of spreads in this group is similar to that of inflation targeting countries. Although with fixed exchange rate we decided to put Latvia here because of macroeconomic similarities with the deficit and low disciplined countries.

The crisis has changed the relationship between liquidity and fiscal risks. Fiscal risks approximated by the CDS spreads are statistically significant in the group of fixed NMS, which means that higher fiscal risk leads to further rise of the liquidity risk, i.e. short term interest rates. However, for inflation targeting countries CDS spreads are insignificant, as it could be observed also in Graph 3, where they remain at lower levels than for fixed NMS. This is another illustration of the fact that the fixed exchange rates are perceived as riskier when using macro policy for coping with the external shocks. But such risk assessment finds no real confirmation in practice, since the countries with currency board are not turned to international institutions during the crisis, and moreover, Estonia was admitted to the Euro zone (January, 2011) by satisfying the necessary Maastricht criteria.

In terms of equations for overnight interest rates the expected relationships were confirmed. The hypotheses of greater degree of monetary integration with the euro before the crisis for the NMS with fixed exchange rate, and the importance of the proper monetary policy for countries with inflation targeting regime were supported. Deficit countries have the same behavior as inflation targeting. The crisis leads to disconnections between overnight interest rates in NMS and euro area, however the impact of euro area monetary variables is observed mainly through the expectations of future interest rate behavior, represented by the three month interest rates. The importance of external perception of fiscal risks increases and CDS were statistically significant with the expected sign. The crisis leads to a strong reduction of the impact of its own monetary policy on overnight interest rates for inflation targeting and deficit countries and becomes statistically insignificant. Concerning deficit countries the overnight interest rates move in the opposite direction from that of the Eonia.

6. Concluding Remarks

In conclusion we can say that the results obtained form the high frequency panel data models support the theoretical hypotheses and policy intuition that it exists a strong relationship between the liquidity risk (measured by the short term money markets) and the fiscal risk (measured by CDS) and that this link is extremely unstable during the financial crisis. The relative performance of different monetary regimes concerning the liquidity-fiscal risk connection is debatable, and although the countries with currency boards is perceived as more vulnerable, the recent practice shows that they are more stable, and did not resorts to foreign financial assistance, at least for now.

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