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Financial stability, monetary policy and budgetary coordination in EMU

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Abstract. *A series of recent studies analyze the impact of financial crisis on the fiscal soundness in the Euro area countries. Even if their documented results present the transmission mechanisms of the financial instability toward the fiscal sector, a more realistic problem is related to the contribution of the fiscal and budgetary disequilibrium to the financial instability propagation. In this line, we show, based on a simple econometric model, that, beside the expansionary monetary policy, the budgetary deficit conducts to the financial stability deterioration. The financial stability of the Euro area is measured based on an aggregate financial stability index, constructed by employing the IMF methodology used for the financial stress index.*

Keywords: financial stability; policy mix; fiscal soundness; Euro area; aggregate financial stability index.

JEL Codes: E58, E61, G01.
REL Codes: 8M, 10C, 20H.

1. Introduction

Once the sovereign debt crisis made its appearance in the Euro area, several economists have associated the deterioration of the public finances situation with the global financial crisis. And this link can not be neglected (see the situation of the Portugal, Ireland, Greece and Spain, so called PIGS countries). The transmission mechanisms of the financial instability toward the fiscal sector are complex. The financial crisis can influence the fiscal sector in different ways. First, the fiscal balance deteriorates due to a decrease in tax revenue resulting from the economic recession and due to an increase in the government expenditures in order to stimulate economic activities. Second, the government debt increases because the governments, in order to save troubled financial institutions and overcoming financial crisis, make appeal to public bonds. In this line, Schuknecht et al. (2011) speak about an unpunctual reformation of the Stability and Growth Pact, associated with the lake of fiscal policy coordination.

It is true that a crisis has a negative impact on the fiscal sector, but is also true that we had a crisis because the fiscal policy and monetary policy coordination was very poor. That is why, a more realistic problem is related to the contribution of the fiscal and budgetary disequilibrium to the financial instability propagation. In this line, we show, based on a simple econometric model, that beside the expansionary monetary policy, the budgetary deficit conducts to a financial stability deterioration. The financial stability of the Euro area is measured based on an aggregate financial stability index, constructed by employing the IMF methodology used for the construction of the financial stress index. Our results show that the financial stability is correlated with the other objectives of the European Central Bank (ECB) and of the national governments in the European Monetary Union (EMU). Consequently, in order to avoid a new crisis appearance, it is necessary to have a better coordination between the ECB and the national governments. This coordination can be achieved by considering financial stability as a common objective. The authorities' cooperation is also supported by different financial stability committees that have been lately created.

The reminder of the paper is the following: section 1 presents the reform of the financial stability framework in EMU, describing the structure of the financial stability committees that have been created at national level; section 2 presents the aggregate financial stability index construction and the econometric test, highlighting the relationship between the financial stability and the others authorities' objectives; the last section concludes.

1. A reform of the financial stability framework in EMU

The recent economic crisis put into discussion the economic policies coordination mechanism inside a monetary area. The policy mix literature, related to the fiscal and monetary coordination, does not look answers in terms of financial stability. Even if a lot of studies (see Beetsma et al., 2001, Laskar, 2003, Oros, 2008) show that the budgetary coordination is necessary for the reduction of asymmetric chocks impact at EMU level, none of these works analyzes the close relation which exist between the macroeconomic stabilization and the systemic financial stability.

The disequilibrium which appears in the real activity has a spillover effect toward the financial system and the public authorities (central banks and governments) are forced to make an intervention strategy. In the Euro area, during the recent economic crisis, the ECB and the national governments have taken repeated measures in order to stabilize the financial activity. At the beginning, the interventions were represented by the liquidity injections in the market – lender of last resort actions. Afterwards, an ample reform of the institutional framework for regulation and supervision was made.

In this context, the European Financial Stability Facility (EFSF) was created by the Euro area Member States following the decisions taken on 9 May 2010 within the framework of the Ecofin Council. The EFSF's mandate is to safeguard financial stability in Europe by providing financial assistance to Euro area member states. EFSF is authorized to use the following instruments linked to appropriate conditionality: loans to countries in financial difficulties, interventions in the debt primary and secondary markets and finance recapitalizations of financial institutions through loans to governments.

In the same time, the European System of Financial Supervisors (ESFS) was created. The establishment of the ESFS is associated with a complicated network of regulatory and supervisory institutions. His objectives are to facilitate cooperation among EU and national supervisors. In the same spirit, on 1 January 2011, the three ESAs were created: the European Banking Authority (EBA), the European Securities and Markets Authority (ESMA), and the European Insurance and Occupational Pensions Authority (EIOPA).

Beside the development of the regulation and supervision institutional structure at EU level, even before the crisis burst-up, different cooperation mechanisms in terms of financial stability was putted into place in several European countries. Financial Stability Committees were created in order to facilitate the cooperation between central banks, national supervision agencies and national governments, in terms of financial stability (Table 1).

As we have saw, the cooperation between authorities in terms of financial stability was improved. However, it is difficult to state that these frameworks are efficient and can achieve only by themselves the Euro area financial system stability. They can have an important contribution in terms of stability, but it is more useful to declare the financial stability as a common objective of the authorities, in order to intensify their efforts in this direction. Furthermore, in this case we do not speak only about a cooperation strategy; we speak about a coordination framework. In the next section we will demonstrate that the financial stability objective is compatible with the others objectives of the ECB (prices stability) and national governments (growth and budgetary equilibrium), and this coordination framework can be established.

Table 1

Financial stability committees

Country	Establishment date	Name	Composition
Spain	2006	Financial Stability Committee	- Central bank - Financial supervision agencies - Ministry of Economy and Finance
Czech Republic	2006	Financial Market Committee	- Central bank - Ministry of Finance - Budget Committee of the Chamber of Deputies
Romania	2007	National Committee for Financial Stability	- Central bank - Financial supervision agencies - Ministry of Finance
Portugal	2007	National Financial Stability Committee	- Central bank - Financial supervision agencies - Ministry of Finance and Public Administration
Austria	2008	Financial Market Committee	- Central bank - Financial supervision agencies - Ministry of Economy and Finance
Poland	2008	Financial Stability Committee	- Central bank - Financial supervision agency - Ministry of Finance
Italy	2008	Financial Stability Safeguard Committee	- Central bank - Financial supervision agencies - Public Treasury
Greece	2008	Financial Stability Committee	- Central bank - Financial supervision agencies - Ministry of Economy and Finance
Finland	2008	Memoranda of Understanding (MoU)	- EU and central banks from Nordic countries - Supervisory authorities - Ministries of finance
Denmark	2008	Danish Act on Financial Stability	- Government - Parliament - Banking association
World-Europe	2009	Financial Stability Board	- Central banks - Financial supervision agencies and national governments

Country	Establishment date	Name	Composition
			- International institutions
Hungary	2010	Financial Stability Board	- Ministry of Finance - Central bank - Hungarian Financial Supervisory Authority
Belgium	2010	Committee for Systemic Risks and System-relevant Financial Institutions	- Central bank - Banking, Finance, and Insurance Commission - Ministry of Finance
France	2011	Financial Regulation and Systemic Risk Council	- Central bank - Public Treasury - Financial supervision agencies - Ministry of Economy
England	2011	Financial Policy Committee	- Central bank - Financial Services Authority
Sweden	2011	Financial stability cooperation arrangements	- Central bank - Financial supervision agency - Ministry of Finance - National Debt Office

Source: Internet site of central banks, ministries of finances, supervision authorities, Financial Stability Board and International Monetary Fund.

2. Financial stability as a common objective for ECB and national governments

2.1. The construction of the Euro area aggregate financial stability index

The main advantage of such an index, called stability or stress index, depending on its construction method, resides in the fact that it represents a dynamic analysis of the financial stability level. It was developed in studies like those of Illing and Liu (2003), Nelson and Perli (2005), Gersl and Hemanek (2006), Cihák (2007), Rouabah (2007) or Albulescu (2010) and it became more popular when it was used by the IMF in 2008 or by the ECB in 2010, in the case of the financial stress index. Such an index can be constructed in different ways. Most of the existing stress indexes are based on high-frequency data, but they differ in the selected variables (banks capitalization, credit ratings, credit growth, interest rate spreads or volatility of different asset classes), country coverage and aggregation method. An important advantage of continuous stress indicators (or financial instability indicators) is that they may reveal periods of small-scale stress that did not result in full-blown crisis and were neglected in studies based on binary crisis variables.

No matter the employed technique, there are few steps that should be followed in the construction of the aggregate financial instability index. After the indicators are defined, they have to be quantified. The accuracy level and the measurement scale have to be established. It often happens that the individual indicators do not have the same accuracy or the same measurement units, situation which is obviously complicating the aggregation into a synthetic index. The indicators' values have thus to be normalized (different normalization methods can be used). Even if the normalization and the aggregation methods raise important theoretical and practical problems, the major inconvenient relates to the indicators weighting. We can choose either to give the same importance to all the variables or to apply a different weight based on the decision making criteria. The standard procedure consists in giving the same weight to all the variables which are included in the aggregate index.

The use of a composite index has a number of benefits (Baxa et al., 2011). First, it approximates the evolution of the financial stress caused by different factors and thus it is not limited to one specific type of instability. Second, the inclusion of additional variables into the instability or stress index does not affect the evolution of the indicator. Third, the composition of the indicator allows breaking down the reactions of the central bank with respect to different stress sub-components.

In this study, in the first phase of the index construction demarche, we have identified the individual indicators, which are calculated on a quarterly basis covering the period 1999: Q1 to 2011: Q1. The 10 financial instability indicators, employed in different research papers on this subject, are presented in Table 2.

Table 2

Financial instability indicators

Individual indicators	Expected contribution to the financial instability	Database
Financial market instability index (FMII)		
Volatility of the stock index return	+	Yahoo finance
Short term interest rate volatility	+	OECD and Eurostat
Economic sentiment indicator	-	European Commission
Banks' financial soundness index (BFSI)		
Bank nonperforming loans to total loans	+	OECD and IMF
Bank regulatory capital to risk-weighted assets	-	OECD and IMF
ROE	-	OECD and IMF
Liquid assets to total assets	-	OECD and IMF
Interest rate spread: three-month Euribor rate – ECB monetary key rate in t-1	+	Eurostat and ECB
External financial vulnerability index (EFVI)		
REER excessive depreciation or appreciation	+	Eurostat
Current account deficit to GDP	+	OECD and Eurostat

Because we want to retain the IMF normalization procedure (see FMI, 2008), we are forced to construct an instability index (AFII), and afterwards an aggregate financial stability index (AFSI) as its opposite. The AFII takes values in the interval [1;10] where 10 represents a high level of financial stress. Consequently, the AFSI retained in our study is the difference between the maximum value which can be registered by the AFII and its real value. In this case, a high value of the AFSI is associated with a satisfactory level of financial stability.

As we can see in Table 2, the impact of the individual indicators on the financial instability can be either positive or negative. In order to use the IMF normalization procedure, we have retained the indicators with a positive contribution and we have transformed the others using their inverse value (e.g. for the indicator "I": 1/I or 100-I). In this way, all the indicators will have a positive contribution to instability (a high level of the indicators points out a high instability).

The normalization procedure for each indicator (and for all the EMU members) is based on the formula:

$$X_{in} = \frac{X_i - \bar{X}_t}{\sigma_t} \tag{1}$$

where: X_{in} – is the normalized value of the X indicator, for the i quarter ; $\bar{X}_t$ represents the average value of the indicator X during the period t and σ_t is the indicator X standard deviation during the period t.

After the computation of the normalized values, we have calculated the partial index (FMII, BFSI and EFVI – see Table 2 above), using the arithmetic mean of the individual indicators incorporated in each index. Finally, the AFII is obtained for each Euro area country, based on the formula:

$$AFII_{iz} = \frac{3 \times FMII_{iz} + 5 \times BFSI_{iz} + 2 \times EFVI_{iz}}{10} \tag{2}$$

where: $AFII_{iz}$ is the aggregate financial instability index for the country z in the i quarter.

Calculated in this manner, the AFII values can be positive or negative. That is why, in order to have a clear picture of the AFII dynamics, it is necessary to use a rescaling method for repositioning the index values in an one interval ([1;100]), as for example that of the IMF, or in another interval that we

have chosen by ourselves ([1;10]), where we usually find the values of the indicators introduced later in the econometric analysis.

$$AFII_{izr} = \frac{AFII_{iz} + abs\left[\min(X_{in1}, X_{in2}, X_{in3}....\right]}{\max(AFII_{tz}) + abs\left[\min(X_{in1}, X_{in2}, X_{in3}....\right]} \times 10 \quad (3)$$

where: $AFII_{izr}$ is the aggregate financial instability index, rescaled, for the country z in the i quarter; $AFII_{tz}$ is the aggregate financial instability index, for the country z in the t period (1999: Q1 to 2011: Q1) and X_{in1} are the normalized values of the individual instability indicators, for each period taken into consideration.

The last step is represented by the construction of the AFII for the Eurozone. The AFII for each country was weighted with the country GDP to Euro area GDP ratio (a weighted mean was then calculated, based on the importance of each country in the Euro area GDP). This choice was made due to the fact that the governments of big countries, like Germany or France, have an important influence in the EU structures and that the ECB decisions are different if the financial systems of large countries become instable. However, we reached the conclusion that the results obtained with the weighted mean and with the arithmetic mean do not differ significantly.

$$AFII_{iEUR} = \sum_{z=1}^{17} AFII_{izr} \times \frac{GDP_{iz}}{GDP_{iEUR}} \quad (4)$$

where: $AFII_{iEUR}$ is the Euro zone aggregate instability index for the quarter i; GDP_{iz} is the GDP of the country z for the quarter i and GDP_{iEUR} is the GDP of the Euro area for the quarter i.

Finally, we have estimated, like we have mentioned at the beginning of this section, an aggregate financial stability index, based on the aggregate instability index for the Euro area ($AFSI_{iEUR}$ = 10 - $AFII_{iEUR}$). Its trend is presented in Figure 1 below, where a high level of financial stability is associated with a high score of the AFSI and the opposite case:

Figure 1. *Euro area financial stability index dynamics*

2.2. Compatibility of the authorities' objectives: an econometric analysis

In this section we have tested the link between financial stability (measured based on an aggregate index) and the other objectives of the authorities (national governments and central banks), namely: the economic growth rate, the inflation rate, the interest rate smoothing and the budgetary deficit. The description of the explanatory variables is made in the Table 3, below.

Table 3

Description of the explanatory variables and expected sign

Indicators	Description	Database	Expected sign	Explanations
GDP	Economic growth rate (quarterly basis, compared to the same period of the previous year)	Eurostat	+	The economic growth rate has a positive impact on the financial stability. An important number of financial crisis appear due to the deterioration of the real economy situation.
Inflation	The inflation rate (quarterly basis, compared to the same period of the previous year)	Eurostat and OECD (starting with 2003:Q2)	+	As a rule, a general increase in consumer's prices is associated with a higher demand on the market. This higher demand is supported by an economic growth and by a financial stability period. In this case, we assist to a sort of short term trade-off between financial stability and prices stability, in relation with the central banks' objectives.
Euribor	Euribor at three months (a *proxy* for the key interest rate	ECB	-	A decrease in the interest rate entails benefits for the financial stability in terms of credit activity reprisal. The burst-up of crisis

Indicators	Description	Database	Expected sign	Explanations
	- which has a weak dynamic) – the average of the period (quarter)			episodes is accompanied by a high level of the interest rate, associated with the risk on the market. Indeed, the authorities make efforts in order to solve liquidity problems and to stimulate the economic growth towards the decrease of the interest rate, even if an inflationary pressure appears on short run. This behaviour favours the financial stability.
Deficit	Budgetary deficit, (calculated as the difference between public expenses and budgetary incomes)	ECB	-	An important public deficit has a negative influence on the investors' perception and, as a result, on the financial stability. Even if it is hard to demonstrate that a higher deficit produces a deterioration of the financial system stability in an automatic manner, we can observe that, at the beginning of the crisis periods, the budgetary deficit is important.

The tested equation is the following (in brackets we have the t-statistic values and the associated p-values):

$$AFSI = \underset{\left(\substack{5.73\\<0.0001}\right)}{2.84} + \underset{\left(\substack{3.13\\0.003}\right)}{0.16}\, GDP + \underset{\left(\substack{2.61\\0.012}\right)}{0.37}\, INFLATION - \underset{\left(\substack{-3.34\\0.001}\right)}{0.37}\, EURIBOR - \underset{\left(\substack{-1.69\\0.098}\right)}{0.10}\, DEFICIT + \varepsilon_t \quad (5)$$

R^2=0.40; F=7.43 ($p<0.0001$)

The results show that the expected sign of the coefficients are obtained and all these coefficients prove significant. The economic growth and the interest rate have, as expected, the most significant impact on financial stability. Due to this link between the financial stability and the other objectives of the authorities, we can state that the financial stability must be considered as a common and declared objective of the ECB and of the national governments in the Euro area countries.

Conclusions

The financial crisis has confirmed the fact that the cooperation mechanisms in terms of financial stability, established at the EMU level, were not efficient. The authorities' interventions in order to save the financial systems had a negative impact in terms of fiscal soundness and credibility. The institutional regulation framework was improved but it is necessary to have not

only cooperation but coordination of the ECB and national governments actions, in order to achieve the financial system stability.

The policy-mix literature focused on the coordination problems in the EMU, but the financial stability objective was not taken into account, as a solution for empower this coordination. In this context and based on the effort made on the institutional side, we sustain the idea according to which the financial crisis can be avoided if the financial stability became *de facto* and *de jure* a common objective of the ECB and of the national governments.

In order to support this idea, we have used a complex and documented methodology for the construction of a financial stability aggregate index for the Euro area. Afterwards, we have demonstrated the existence of a strong compatibility between the stability objective and the others declared and stipulated objectives of the authorities, namely the economic growth, the price stability, the interest rate smoothing and the budgetary soundness (a short term trade-off appears in terms of prices stability). Our econometric test results indicate the necessity to consider the financial stability as a common objective at EMU level.

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