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Original Paper

Sovereign risk and Financial Stability. Evidence from Eurozone Countries

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Abstract

We will investigate in this paper the relationship between sovereign risk and domestic banks' exposure to the government debt, using data for eurozone countries. The sovereign-bank nexus shows that there are substantial influences between the fiscal and the financial sector and that in absence of enough fiscal buffers, the rise in public borrowing will contribute to financial market imbalances, through various channels. We apply impulse-response functions in order to investigate the effect of a shock produced to sovereign risk to banks' exposure to government debt. Our results confirm that there are significant interlinkages between sustainable fiscal positions and financial markets performance, so that reducing debt levels can contribute to decreasing sovereign risk premia and improvement in financial conditions, decreasing the exposure of the banking sector to holding large shares of debt, which can result in deteriorating economic conditions.

Keywords

sovereign-bank nexus, systemic stress, financial markets, banking sector exposure to domestic debt

1. Introduction

We will analyze in this paper the relationship between financial stabilization and fiscal policy, taking into account the interlinkages between the financial sector and public finances. The financial channels which impact budgetary indicators can be investigated from the perspective of debt sustainability which depends on the crediting conditions imposed by financial markets.

Fiscal policy plays an important macrostabilization role, fiscal instruments being used as countercyclical tools during recessions to reduce business cycle fluctuations. Fiscal policy intervention contributed to smoothing negative output shocks using rises in public spending to finance economy during contractions. The extensive use of fiscal expansionary policies during the previous financial crisis contributed to resuming positive growth rates. At the same time, the post crisis surge in debt levels in euro area countries requires implementation of fiscal consolidation to ensure sustainability of public finances.

The response of governments to the Global Financial Crisis, the sovereign debt crisis and the pandemic crisis has consisted in massive rises in public expenditure or reductions of taxation, to support economic recovery. Taking into account the increase in public indebtedness and deficits, fiscal policy could represent an additional source of volatility, as it was the case of Greece during the sovereign debt crisis. The misreporting of deficits and debt levels contributed to a crisis which could have resulted in sovereign default without financial assistance from international institutions.

Therefore, the interlinkage between fiscal policy and financial stability is extremely important in order to avoid situations in which either states influence financial markets through the accumulation of excessive public debts or financial markets react to high government debts by causing potential disruptions in ensuring financing for debt rollover.

In case of sovereign risk increases, financial markets reaction represents an important indicator for assessing the vulnerabilities of the economy. We will refer to the relation between banks and sovereigns, the so-called doom-loop, which refers to the fact that states are exposed to the risks arising from the banking system while banks have important exposures to sovereign debts, as they hold substantial shares of government bonds in their portfolio.

The sovereign-bank nexus refers to the multiple relations between sovereign risk, as measured by an increase in sovereign CDS (Credit Default Swaps) and banking system risk measured by bank CDS (Credit Default Swaps). The co-movement between sovereign risk premia and banking sector indicators in case of a crisis is an important measure of the exposure of banks to government debt and of states to the financial sector.

Therefore, prudential regulation for the banking system could prevent that financial markets produce additional volatility in case of crises and limit the bank exposure to government bonds. At the same time, sound fiscal positions ensure debt rollover without producing financial disruptions which could result in incapacity of payment or default. The government debt held by banks is treated as a risk-free asset, which has aroused important questions regarding the degree of exposure of banks to domestic debt. The home bias arises from the fact that banks in the eurozone tend to hold large shares of domestic debt in their portfolio, which requires prudent debt management.

The sovereign debt crisis in 2012 produced significant financial panic among eurozone countries, as the case of Greece unable of paying its debt service, reflected widespread problems in the management of public finances and produced important spillover effects on the other euro area member states. Thus, Italy. Spain, Portugal and Ireland confronted with significant banking system problems and required bail-out intervention from states to prevent deterioration of banks' balance sheets. The contagion effects which emerged during the sovereign debt crisis in EZ states showed how impossibility to ensure debt service payments results in negative spillovers for the other countries members of a monetary union.

In this paper we intend to investigate the relation between banks and sovereigns, the so-called sovereign-bank nexus, considering the effects of the sovereign debt crisis produced by the financial problems of Greece unable to provide financing for its debt service, which raised sustainability concerns regarding the fiscal stance of euro area members and resulted in significant banking sector problems. The increase in sovereign risk premia influenced the financial sector and raised financing costs. Deteriorating financial market conditions have been aggravated by the capacity of sovereigns to ensure effective debt rollover.

We will use for our analysis data for core and periphery eurozone countries, during the period 2000-2024. We intend to assess the relation between systemic stress, as an indicator for a sovereign creditworthiness and the degree of domestic debt exposure of banks in the eurozone, measured by the ratio of sovereign debt holdings to total assets of banks. We employ a vector autoregressive model for eurozone countries, to analyze the results of impulse-response functions in case of a shock to one of the variables included in the model.

We will analyze the results of impulse-response functions for core and periphery eurozone countries, taking into account that during the sovereign debt crisis periphery countries have experienced significant debt sustainability issues, which have produced effects on the other euro area countries. The accumulation in debt levels in the aftermath of the financial crisis required important interventions in order to prevent sovereign default in case of Greece and showed the effects of financial contagion, when a shock originating in one country member of a currency union propagates to other members of the monetary union.

The remainder of the paper is organized as follows. After reviewing the literature on financial stability and fiscal policy, the next section presents the relation between sovereign risk and banks' domestic exposure, the feedback loop between banks and sovereigns, followed by the econometric analysis and discussion of results. The final section concludes.

2. Method

2.1 Literature Review

There is an important relationship between fiscal policy and financial stability as the lack of fiscal space contributes to negative spillovers on financial markets, while financial market imbalances can affect the fiscal stance due to the impossibility to ensure effective debt financing.

Increases in private debt precede domestic banking crises, while banking crises accompany sovereign debt crisis. There are important increases in public indebtedness buildup before a sovereign debt crisis. Banking and debt crisis are also preceded by large accumulation of private and public borrowing, with a change in debt composition towards short-term maturities (Reinhart & Rogoff, 2011).

The financial determinants for fiscal policy volatility, financial development and financial stability are analyzed using data for 96 countries spanning from 1990-2019. Results show that financial development has a smoothing effect on fiscal policy, while financial instability produces opposite effects on volatility (Ma & Lv, 2023).

The volatility of fiscal policy is found to be increasing in emerging market economies and developing economies compared to advanced economies and also in commodity exporters related to non-commodity exporters in a study using data for 1990-2021 (Marioli et al., 2023).

The periods of crisis exacerbate the volatility of fiscal policy and influence the capacity of financial markets to ensure financing for debt payment service, resulting in rising indebtedness, increasing sovereign risk and increasing the cost of finance. Financial markets are more influenced by the economic fundamentals of a country during the crisis period compared with periods before the crisis (Beirne & Fratzscher, 2013).

There is a close relation between financial market development and sovereign defaults as more developed financial markets tend to penalize more strictly public defaults and thus increase incentives for governments to repay debt (Gennaioli et al., 2014)

At the same time, the sovereign and financial risks are reinforcing, as fiscal risks contribute to financial system problems, by reducing the scope for deposit guarantees, undermining banks' balance sheets which hold government debt and weaken the potential for implementing countercyclical fiscal policies (BIS, 2016).

The sovereign-bank nexus refers to the multiple channels through which the sovereign and the banking system relate, taking into account that domestic banks hold substantial shares of government bonds and are subject to risks arising from sovereign risk premia modifications. The channels through which the banking system can affect sovereign creditworthiness include the bail-out cost for the banks which hold government debt, and the impact of banks' experiencing stress on credit, interest rates for the private sector which spill over to the growth ratio of an economy (Fontana & Langedijk, 2019).

Credit risk in the banking sector and in the sovereign sector are interconnected through multiple linkages. For instance, bank risk shocks can transmit to the state via channels such as credit supply. In case banks experience balance sheets difficulties, this will influence the supply of credit in the economy, decreasing growth, investment and tax revenues. Another channel is represented by bank bailouts, as during bail-outs government and bank risks reinforce each other (Fratzscher & Rieth, 2015). Another transmission channel from sovereign to bank risk consists in the fact that in case of increases in systemic risk this raises questions on the guarantees offered by government to banking sector (Allegret et al., 2017).

The sovereign-bank nexus is reinforced due to exposure to non-domestic debt, while zero-risk weighting results in an increase of the risk and funding costs for sovereigns (Kirschenmann et al., 2017). Establishing concentration limits in the banks' balance sheets for holding domestic debt securities could reduce the home bias as a channel of contagion (De Bruyckere et al., 2012). Sovereign exposure can be reduced by implementing measures to deal with preferential treatment for sovereign bonds, which are considered as risk-free assets and by reducing home bias in banking system portfolios, as well as financial repression and shallow financial sector in some EMDE (Feyen & Zuccardi, 2019).

In countries with low sovereign risk banks can increase domestic exposure resulting in strengthening of the nexus sovereign-banks, while in countries with high sovereign risk there is a reverse effect. Therefore, banks should own significant capital buffers related to non-zero risk-weighing for sovereign risk (Baule et al., 2023).

The sovereign exposure from banks which have sovereign bonds within their portfolios can be considered an externality which could be used to impose tighter regulations in the banking sector (Abad, 2019). During crisis when government bonds holdings are risky assets, domestic banks holding large shares of public debt are exposed to increasing risks from losing sovereign creditworthiness, which affects balance sheets of banks. Thus, the reform of the banking sector at EU level by transferring the supervision of large banks from state to European level could contribute to a reduction in state vulnerability in face of banking crisis (Merler & Pisani-Ferry, 2012).

Other studies find that banks' size and the amount of Eurozone sovereign debt in their portfolio influences the share of credit risk for banks which is related to sovereign risk premia increases (Li & Zinna, 2014). The drop in price of holdings of sovereign bonds will weaken banks' balance sheets and any sovereign risk rise will result in a tightening of the funding conditions of the banking sector (Borio et al., 2023).

The level of public indebtedness influences the balance sheets of banks, due to risks from deteriorating fiscal conditions and loss of sovereign creditworthiness. The effect of public debt increases on banking sector risk is sizeable, taking into account that states could face further rises in debt from materialization of contingent liabilities from guaranteed schemas, and also from indirect channels, as higher debt influences domestic banks through a negative impact on debt financing conditions (Lozano Guerrero et al., 2020).

The influence of public borrowing on the banking sector is more pronounced in case of countries already experiencing financial and fiscal stress or during periods of economic contraction. In stressed countries, banks were affected by increases in debt as public debt repricing resulted in large equity losses, while weaker banks were led into deleverage, resulting in a decline of borrowing (Altavilla et al., 2016).

The multiple interlinkages between the sovereign creditworthiness and banking sector are reinforced by the fact that states are exposed to risks arising from increasing levels of indebtedness, resulting in fiscal vulnerability and exposure to rising sovereign risk premia. At the same time, banks are exposed to their government through holdings of government bonds in their portfolio, which can affect their balance sheets as debt is treated as a risk-free asset.

2.2 Sovereign Risk and Domestic Debt Exposure of Banks

The relationship between sovereign risk and financial stability can be considered from the perspective of the sovereign-bank nexus, which refers to how sovereign risk and the banking system relate. While banks hold important shares of government debt within their portfolios, the governments are also exposed to banks through state interventions during crisis to bail-out banks. The state should intervene in the banking system either through significant capital injections during crisis, bank recapitalizations or purchases of assets.

There are important interlinkages between financial system risk and sovereign risk, as a country with financial system problems has also higher sovereign bond yields. In countries which bailout financial firms the sovereign risk increases consequently (Pagano & Sedunov, 2016).

The exposure of states to banking system risks and the exposure of banks to their governments by holding domestic debt has been considered an important issue, especially in view of the sovereign debt crisis which has produced important modifications regarding the sustainability of public finances in order to prevent debt distress resulting in default or insolvency.

The evolution of sovereign risk requires monitoring taking into account the lack of fiscal space due to the accumulation of impressive levels of public debt in the aftermath of the financial crisis. Financial stability can be ensured by providing an adequate regulation for financial markets. Financial stability is related to the capacity of sovereigns to roll-over existing debt. The impact of rising sovereign risk on financial markets represents an important issue, taking into account the sovereign debt crisis, when the accumulation of debt levels in Greece transmitted across euro area countries and produced contagion effects in other EZ countries which faced situations of debt unsustainability.

Financial contagion in sovereign debt markets is related to the transmission of volatility across financial markets, as sovereign spreads are influenced by the perception of investors regarding the capacity of countries to finance debt, which can potentially lead to sovereign default. The capacity of the government to roll-over existing debt is related to increasing sovereign bond yields and producing rises in sovereign bond premia. This phenomenon can trigger substantial effects for countries within a monetary union. A country within a monetary zone experiencing difficulties in providing the necessary resources for debt financing will produce destabilizing consequences for the other countries of the monetary union.

The macroeconomic policy for the European Central Bank to reduce volatility transmission in the sovereign debt markets could be based on achieving low levels of inflation, while the macroprudential policy should be based on lower financial stress (García & Rambaud, 2023).

Public debt is situated at exceptionally high levels after the Global Financial Crisis, the Sovereign Debt Crisis and the pandemic crisis. The accumulation in debt levels in EZ countries can be analyzed considering the financing for debt, from public and private sector and the level of interests due for debt, so that debt roll-over can be ensured without rising sovereign risk premia.

Financial stability is also related to the capital market development, the functioning of financial markets which can act as efficient shock-absorbers in case of negative output shocks. The regulatory framework for financial markets is important so that to ensure that financial markets do not contribute to increasing disruptions or causing disturbances in the functioning of financing channels for debt finance. At the same time, the sovereign exposure to debt owned by financial institutions represents an important issue – the sovereign-bank nexus, which requires that states should establish clear regulations for the share of domestic debt owned by banks so that to prevent situations of default or insolvency.

At the same time, eurozone member states should implement a banking union, which should add to the monetary union, and which should contain clear regulations for the functioning of banking sector to prevent situations of default, insolvency or lack of liquidity. Ensuring financing during crisis proves to be a complex issue, when the reaction of financial markets to sudden output shocks has produced even more volatility, contributing to impossibility of debt rollovers.

The fact that banks own a significant share of government debt in their balance sheets exposes them to rising systemic risk in situations of declining sovereign creditworthiness, and states should intervene to bail-out banks in case of crisis. Also, the lack of fiscal buffers contributes to increasing fiscal sustainability problems, due to scarce fiscal resources to implement countercyclical policies during recessions, increasing vulnerability to crisis. Fiscal policy countercyclical tools represent an effective instrument to resume positive growth, mostly by using debt as an instrument to finance real economy. High public indebtedness increases the exposure of sovereigns to banking sector, as states government bonds are bought by domestic banks and makes states vulnerable to financial markets which impose severe financing conditions, depending on sovereign creditworthiness.

The current treatment of sovereign bonds held by banks as a risk-free asset increases this interdependence between banks and sovereigns. The sovereign-bank nexus can be reduced by changing the regulations in Basel III for banks holding shares of government bonds, by changing the treatment of government bonds from risk-free assets and introducing risk-weighing requirements. The risk-weighing of government bonds should be calculated based on the sovereign risk included in government bonds, which could allow banks to own specific capital to hold government bonds, based on the bonds rating.

2.3 Methodology and Data

We will use a vector autoregressive model to analyze the relationship between the main variables considered in this paper, sovereign risk as an indicator for fiscal policy and domestic exposure of banks as an indicator for financial stability. We will use data for core and periphery countries members of the eurozone, spanning from 2000 to 2024. Data are expressed in monthly frequency.

As a measure of fiscal policy, we use data for the Composite Indicator of Sovereign Stress. The indicator is calculated as index, monthly data, from European Central Bank, from September 2000 until January 2024.

For financial stability we use an indicator referring to banks' exposure to domestic debt, calculated as a ratio of debt securities holdings to total bank assets. We use monthly data, from European Central Bank, spanning from September 2000 until January 2024 (Figure 1 and 2).

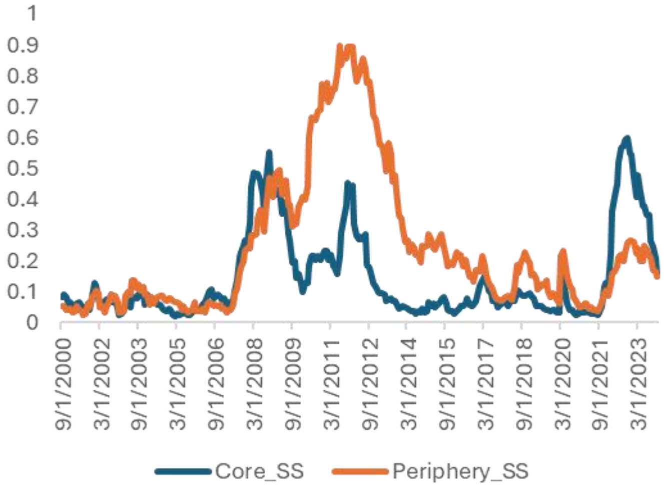

Figure 1. Composite Indicator of Sovereign Stress, Core and Periphery Euro Area Countries, 2000 September-2023 December

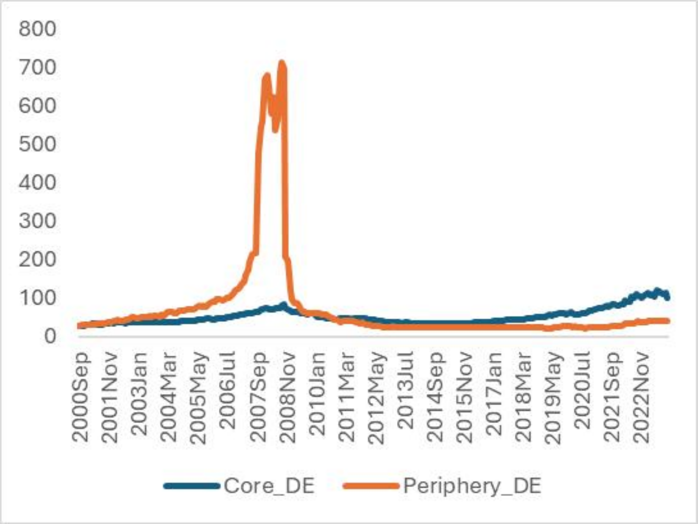

Figure 2. Domestic Banks' Exposure to Sovereign Risk, Core and Periphery Euro Area Countries, 2000 September-2023 December

3. Results and Discussion

We present the results of impulse-response functions in case of a shock produced to one of the variables included in the vector autoregressive model to the other variables. We use for analysis two groups of eurozone countries, core and periphery, depending on data availability in order to discern the differences between the two main groups of EZ countries. Our data cover the period of Global Financial Crisis (2007-2008), the Sovereign Debt Crisis (2010-2012) and the pandemic crisis. The period of crisis should allow to discern possible spillover effects from financial markets to fiscal policy and also from growing fiscal risks to the functioning of financial markets (Figure 3, 4, 5 and 6).

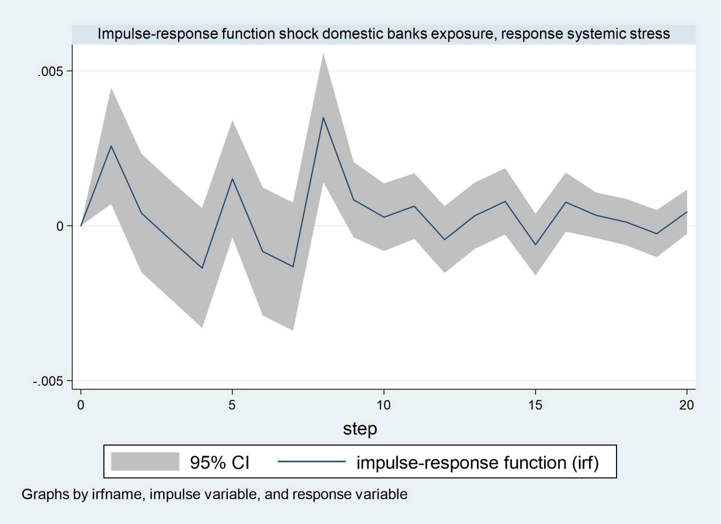

Figure 3. Impulse-Response Function, Shock from Domestic Debt Exposure of Banks, Response Systemic Stress, Core Eurozone Countries, 2000-2024

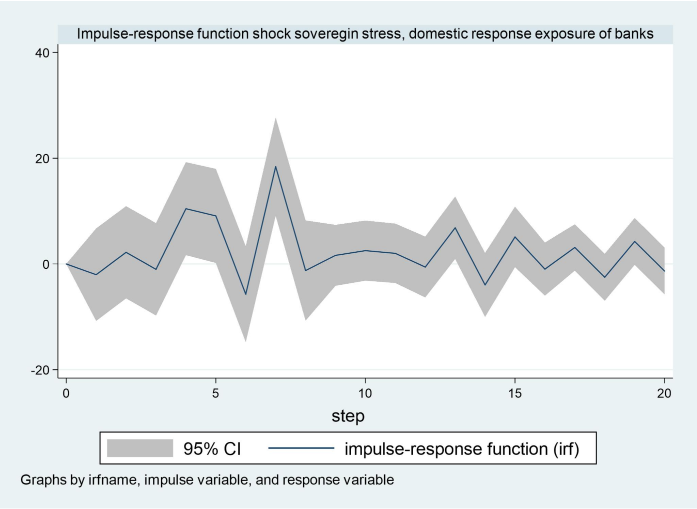

Figure 4. Impulse-Response Function, Shock from Systemic Stress, Response Domestic Debt Exposure of Banks, Core Eurozone Countries, 2000-2024

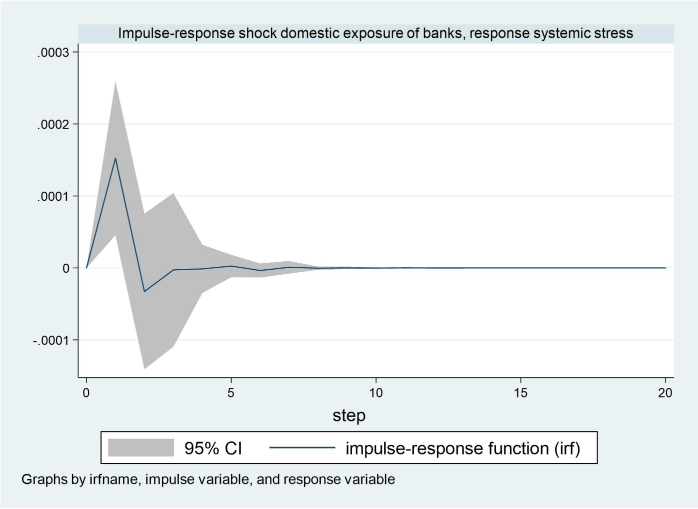

Figure 5. Impulse-Response Function, Shock from Domestic Debt Exposure of Banks, Response Systemic Stress, Periphery Eurozone Countries, 2000-2024

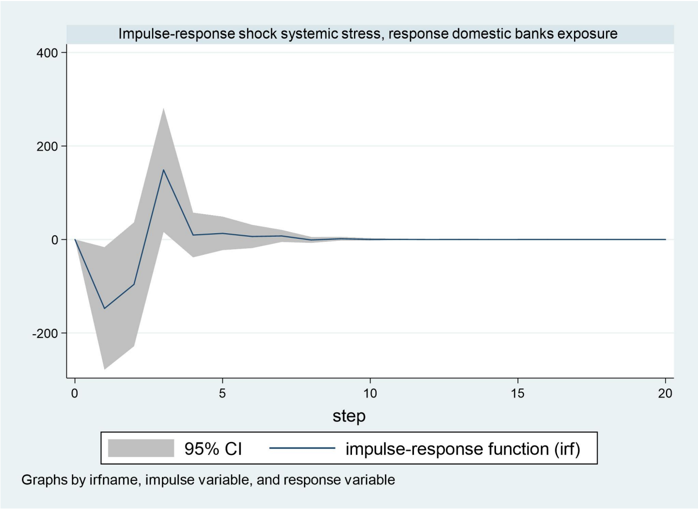

Figure 6. Impulse-Response Function, Shock from Systemic Stress, Response of Domestic Debt Exposure of Banks, Periphery Eurozone Countries, 2000-2024

In case of a shock produced to domestic banks' exposure to sovereign debt, the response from systemic stress in core eurozone countries will consist in a rise of 0.02 percentage points after one month, after which the ratio of banks exposure will start to decline for four months, followed by an increase and reaching its peak at 0.04 percentage points after nine months.

In case of a shock produced to sovereign stress, the response from domestic banks' exposure to sovereign debt in core countries members of euro area will consist in an initial decline for one month, followed by subsequent fluctuations, with a peak at 20 percentage points after 7 months, after which the response tends to stabilize gradually.

In case of periphery eurozone countries, a shock produced to domestic banks' exposure to sovereign debt will produce a response from sovereign stress consisting in an initial rise of 0.001 after one month, followed by a decline to -0.001 after two months. After five months, the response from sovereign stress will tend to return to a steady trajectory.

In case of a shock produced to sovereign stress in case of euro area periphery countries, the response from domestic banks exposure to sovereign debt will consist in an initial drop to -0.2 in the first month, followed by a rise to 2 percentage points after four months. After five months, the response from domestic banks exposure will return to a stable trajectory.

4. Conclusions

We have tried to analyze in this paper the relation between the domestic exposure of banks to government bonds in their portfolios and the sovereign risk, the so-called sovereign-bank nexus. The sovereign debt crisis in eurozone countries has shown how buildup of public debt can spill over to financial sector, by producing contagion effects for the other countries members of the eurozone. Fiscal and financial sector imbalances are interlinked, so building fiscal buffers and decreasing the level of indebtedness will reduce the financial market disturbances.

The exposure of banks to the government debt by holding a large share of government bonds in their portfolio can be reduced by establishing prudential regulation for sovereign exposure and by changing the preferential treatment for government bonds which are considered as a risk-free asset. The sovereign doom loop, referring to the interaction between banks and sovereigns, is manifested through the fact that banks own a significant share of government debt in their balance sheets, which increases their exposure to sovereign risk arising from the high levels of public debts. States are also exposed to risks related to insufficient macroprudential regulation for the financial sector, which means that states should intervene to bail-out banks in case of situations of insolvency in the banking sector.

The results of impulse-response functions show that on impact a shock produced to domestic banks exposure will increase sovereign risk, while a shock produced to sovereign risk will result in a decline of banks' exposure to domestic debt. There are not significant differences between core and periphery eurozone members states regarding their response in case of fiscal and financial shocks. Yet, periphery eurozone countries have experienced more profound financial distress as a result of excessive debt accumulation, which has produced the crisis in Greece, affecting the other euro area countries through banking sector problems and increases in systemic stress ratios.

The high levels of public borrowing accumulated in the aftermath of the last financial crisis produce substantial difficulties for governments to prevent rises in risk premia, which could result in declining financing sources for debt rollover. Therefore, an operational banking union, with a clear prudential framework, should contribute to ensure that the sovereign-bank nexus does not represent an additional source of volatility during crisis.

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