Assessing the Euro Area's Shock-Absorption Capacity

Risk sharing, consumption smoothing and fiscal policy

Cinzia Alcidi and Gilles Thirion

Abstract

Based on a combination of quantitative analysis and a qualitative forward-looking approach, this paper assesses both the state of play and the future capacity of the EMU to respond and adapt to asymmetric shocks. The objective is to provide a basis upon which to gauge the potential value added of a European Unemployment Benefits Scheme (EUBS), against the background of the recent plans for the Banking Union, the Capital Markets Union and the reform of the fiscal governance framework. We find that the capacity of the system to deal with asymmetric shocks (and in principle reduce their occurrence) is likely to increase due to these changes, but it will remain limited in the medium term and certainly lower than in the US. We also argue that given the broad pro-cyclicality of fiscal policy, the idea that national policies alone can deal alone with asymmetric shocks is not realistic. Lastly, we maintain that an ex-ante fiscal insurance mechanism can provide some degree of income smoothing and is likely to catalyse market insurance. Fiscal and market insurance can reduce the role of credit and borrowing, which until now has been the main channel for shock absorption in the euro area but also the least effective in times of crisis. We conclude that, from a macroeconomic point of view, an EUBS is a useful tool to improve shock absorption capacity and is not mutually exclusive with market risk sharing.

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1. Introduction

This paper seeks to assess both the general state of play and the future capacity of the euro area to smooth and absorb asymmetric shocks through various channels. The objective is to provide a basis for gauging the potential value added of European Unemployment Benefits Scheme against the background of the recent plans for further integration such as the Banking Union (BU) and Capital Markets Union (CMU), and the reform of the fiscal governance framework. In particular, we ask whether private risk sharing and domestic fiscal policy could be sufficient adjustment mechanisms to allow the E(M)U to effectively deal with shocks in the future. The assessment is based on a combination of quantitative analysis of the relevant adjustment channels and a qualitative forward-looking perspective.

The starting point for this analysis is our contention that the discussion on the benefits of a future stabilisation device, such as the European Unemployment Benefits Scheme (EUBS), needs to be embedded in a broader debate: one that considers the role of different shock-absorbing mechanisms. Indeed, in a monetary union, the impact of country-specific shocks can be absorbed via various channels, whether they are domestic, like fiscal policy and price adjustments, or international, namely cross-border mobility of workers and access to international financial markets.

This paper focuses on the role played by the integration of financial markets and by domestic fiscal policy, in the framework of the EU governance architecture.

The degree of development and integration of the financial system affects the working of capital and credit markets and their ability to function as shock absorbers to asymmetric shocks. Indeed shocks can be smoothed via:

o *International (spatial) risk sharing* made possible through access to international capital markets; and

o *Consumption smoothing* (or intertemporal risk sharing) through use of savings and access to international credit markets.

Domestic fiscal policy deals with asymmetric shocks through automatic stabilisers and, in principle, countercyclical discretionary spending to stabilise domestic income.

These two areas have been the object of important changes recently, and both are likely to affect the shock absorption capacity of the E(M)U in the near future. However, the capacity to adapt and respond to shocks also depends on other factors: in particular, wage corrections and labour mobility. These involve adjustments in the labour markets and they become inevitable when an asymmetric shock is permanent.

In the case of a supply shock, whether symmetric or asymmetric, changes in relative prices and production patterns are inevitable. While certain policies can provide temporary buffers and gain time, they cannot necessarily assure structural change. [1]

The original optimum currency area (OCA) theory (Mundell, 1961) identifies cross-border mobility of labour[2] as a crucial adjustment mechanism to (long-lasting) asymmetric shocks. In the euro area, this channel seems to have worked only moderately.

Lastly, as argued by Kenen (1969) in the case of monetary unions, where monetary policy is not anymore available to respond to asymmetric shocks, common fiscal resources can be an important complement to domestic fiscal policy. They can also be important is the case of symmetric shocks, as it is the case in the US. Various forms of transfers from the federal government to states generally exist in federations. Transfers can have: i) redistribution effects (permanent transfers from richer to poorer regions), and ii) insurance effects against country-specific macroeconomic shocks via temporary transfers (like a common unemployment insurance scheme), or iii) insurance effects against common shocks (inter-temporal stabilisation under certain conditions).

By assessing the effectiveness of different shock absorption mechanisms, we attempt to offer an overview of the resilience of the EMU to shocks that takes into account the recent governance developments and help understand if and which additional mechanisms are required. The question of how to enhance the EMU responsiveness to shocks is indeed particularly relevant in the current context where a number of official reports, including the recent Five President Report[3], have referred to the introduction of economic stabilisers for the euro area. This is also important in the current political debate, which is divided between two opposing views. On the one hand, those who argue that the new integration efforts and governance changes will boost the functioning of market mechanisms for private risk sharing and restore the capacity of domestic fiscal policy to stabilise the economy against asymmetric shocks, hence making additional (supranational) fiscal tools unnecessary. On the other hand, those who argue that further financial integration will not be sufficient to ensure that market mechanisms deal in a proper way with the effects of asymmetric shocks and that it could even be a source of instability. In addition, given the member states' poor track record in enforcing fiscal rules and the outstanding weaknesses in the EMU's architecture, it remains unsure as to whether the new system of governance will be sufficient to allow

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[1] The investigation of this channel goes beyond the scope of this paper, for a more detailed analysis see among others, OECD (1999) and the role of labour markets in adapting to shocks.

[2] See Alcidi et al. (2016) on how an EUBS could affect the mobility of workers.

[3] Available at: https://ec.europa.eu/priorities/sites/beta-political/files/5-presidents-report_en.pdf

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national fiscal policy to act as a significant stabilisation tool. For these reasons, some forms of fiscal insurance are desirable.

Prior to reading the analysis, one should recognise that the forward-looking nature of the exercise, which looks at how some of the channels illustrated above will work in the future, entails several levels of complexity. Indeed, the CMU project is still in the planning stage, a fully-fledged BU does not exist yet and we do not have the hindsight to detect the effect of the new system of economic governance. Hence, what we want to measure is in fact unobservable, and is surrounded by uncertainty. Overall, this implies that some features of the channels can be investigated only in a qualitative fashion and that only a few of their properties can be translated into quantitative variables.

Lastly, it is worth noting that while this contribution refers to both the EU and EMU, the literature that looks into 'regional' stabilisation mechanisms is usually concerned with monetary unions. Indeed, the loss of national monetary policy implies that the economic rationale for common fiscal risk sharing mechanism will become stronger. Therefore, the analysis will focus on the euro area. However, it must be noted that European governance refers more broadly to the EU (with some specific provisions for euro-area countries) while the Banking Union is mostly (but not only) important for countries that share the euro, with the European Central Bank (ECB) playing a key role. Similarly, developments in the Capital Markets Union will be highly intertwined with the single market regulations, which have an EU basis.

Against this background, section 2 focuses on the role of national fiscal policy as a countercyclical tool and discusses what one could expect from the new fiscal governance framework. Section 3 moves to international adjustment channels and summarises the role of labour mobility as shock absorber, based on the most recent literature. Section 4 attempts to shed light on the policy debate about the role of international market mechanisms by, first, looking into the existing literature, and, second, by proposing a forward-looking analysis. In particular, we complement the discussion on the capital and credit markets' smoothing capacity with an empirical exercise seeking to 'guesstimate' the capacity of shock absorption of EMU in the medium term (by which time the Banking Union should be well in place and some progress towards a CMU should have been made). Section 5 discusses whether market and fiscal insurance mechanisms are alternative or complementary. The last section draws conclusions on the future capacity of the euro area to smooth the impact of shocks and the possible benefits, if any, of an EUBS.

2. EU economic governance and fiscal policy: Will fiscal policy be less pro-cyclical?

2.1 Fiscal policy over the cycle: some stylised facts

The value added of creating an EUBS directly depends on the income-stabilisation capacity of national fiscal policies[4]. The Stability and Growth Pact (SGP) was primarily designed with the idea that (ex-ante) fiscal rules would be able to reduce the risk of negative externalities

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[4] For a more detailed analysis, see Alcidi, Gros and Thirion (2016)

related to excessive deficits and debt accumulation, and would allow to build-up sufficient fiscal buffers in order to, in principle, provide fiscal stabilisation ex-post when the economy faces an economic slack (the 3% deficit). However, simple empirical evidence on the fiscal policy stance over the different phases of the business indicate that the fiscal governance framework fell short in terms of counter-cyclical policy outcomes. Figure 1 captures the behaviour of the discretionary component of the national fiscal policy stances (measured as changes in the cyclically adjusted primary balance) over the cycle. It provides an account of the episodes of pro-cyclical and counter-cyclical fiscal policy stances[5] of the member states over three sub-periods (pre-EMU, up to the crisis and the crisis), distinguishing between the 'good times' (output gap >0) and 'bad times' (output gap <0). It shows that there is a pro-cyclical bias, with only 20 to 45% of episodes of counter-cyclicality, across the three periods under consideration[6].

Instead of counting the cases of pro- and counter-cyclicality across countries, Figure 2 considers the aggregate fiscal stance of the euro area and displays the changes (from the previous period) in the structural (cyclically adjusted) and in the discretionary component of the fiscal balance. It thus illustrates the overall fiscal impulse and provides a more encompassing picture of the stabilisation of fiscal policy over the cycle in the euro area.[7] It appears that, on aggregate, fiscal policy was generally less pro-cyclical during the pre-crisis years than suggested by Figure 1. One explanation for this is that larger countries were more counter-cyclical. By contrast, the pro-cyclicality of the discretionary component is strongly visible from 2011 onwards, when discretionary policy is contractionary while the output gap is still negative and even declining. The figure also shows that such a trend was offset by the cyclical component.

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[5] Pro (counter) – cyclical policy stance is defined as a case where output gap is positive (negative) and changes in the primary cyclically adjusted balance are negative (positive). Note that while other authors use the changes in output gap rather than levels, we prefer to use levels since this better reflects the position in the cycle.

[6] Note that there is a substantial amount of heterogeneity. For instance, Germany has exhibited a relatively low degree of pro-cyclicality.

[7] Note that there are limits to the stabilising features of fiscal policy activism. Blanchard at al. (2010) emphasise the importance of discretionary fiscal actions in mitigating the effects of a severe and protracted slump, but suggest that discretionary fiscal measures tend to come too late to fight a standard recession, leading only to limited counter-cyclicality during 'normal times'.

Figure 1. Episodes of pro- and counter-cyclical fiscal policy in the EMU (1995-2014)
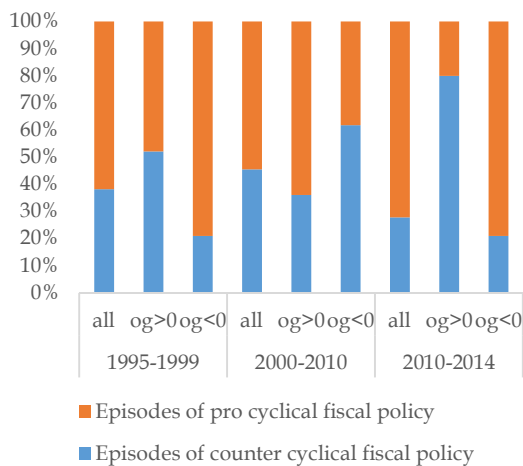
Figure 2. Fiscal stance decomposition, euro area
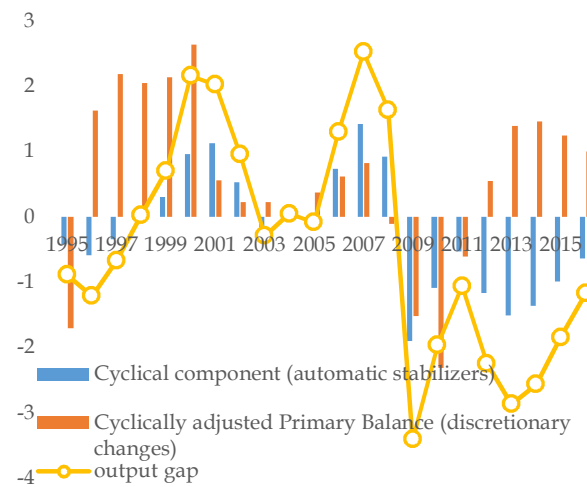
Source: Alcidi et al. (2016).

It seems then that fiscal rules have not worked effectively to create room for countercyclical fiscal policy at national level so that it could act as an income stabiliser tool in response to asymmetric shocks. One critical shortcoming of the SGP stems from the asymmetry of its rules. This problem was compounded by the poor credibility of the no-bail out clause that resulted in weak market discipline prior to the sovereign debt crisis. According to De Grauwe (2013), fiscal rules tended to create a deflationary and recessionary bias in the eurozone, by becoming binding in times of recession. However, according to empirical evidence presented in Alcidi et al. (2016), the picture is more nuanced: risk premia and high public debt rather than fiscal rules appear to have affected the policy stance during the recession. In broad terms, the level of debt, rules and risk premia, all tend to exert pressure for a prudent fiscal stance, but fail to affect the cyclicality of the fiscal policy stance in a systematic way. In bad times, high risk-premia induce pro-cyclicality while fiscal rules, which become binding because of the level of deficit, eliminate the counter-cyclicality observed when governments have fiscal space. In good times, fiscal rules seem to reduce pro-cyclicality but there is no evidence that in any way induce counter-cyclical behaviour. Overall, fiscal policy exhibits pro-cyclicality but it is difficult to identify how much is to be ascribed to fiscal rules or to other factors, like lack of (or excessive) market discipline and high debt.

2.2 *Fiscal policy to smooth the cycle: what to expect from the new fiscal governance framework*

The crisis unveiled the weaknesses of the existing framework of economic and fiscal governance and triggered a number of reforms.[8] New rules were added to previous ones and

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[8] It should be noted that given the general discontent about current fiscal rules, both in term of the lack of enforcement and their inability to prevent imbalances, the debate on the re-design of rules is

balanced budget rules were enshrined into national law. Coordination and surveillance were reinforced, going beyond fiscal policy with the Macroeconomic Imbalances Procedure (MIP). The MIP's purpose is to prevent the emergence of excessive imbalances by imposing prudent behaviour and encouraging the correction of excessive imbalances at an early stage before they lead to large shocks that could spill over into other countries. New rules were also introduced for the coordination of national economic policies if a shock occurs.

If the new framework were to function effectively and member states were not constrained in the use of automatic stabilisers, national fiscal policy could play a relevant stabilisation role and the value added of a common scheme at European level would be limited. Against this background, the rest of this section evaluates the potential benefits and limits that the new framework could bring about.

The enshrinement of fiscal rules in national law (Fiscal Compact) constitutes, at least in theory, an important step towards better enforcement and a contribution to reduce the risk of future large shocks. However, most countries seem to have forgotten about their existence. Moreover, the current approach of the Juncker Commission, which tends to grant a flexible interpretation of the Stability and Growth Pact[9] under certain conditions, while reasonable, raises questions on the credibility of full compliance with the rules in the future.

The legacy of the crisis, in terms of high debt and weak economic conditions, means that we may experience a long transition before rules are be strictly enforced. It may be not a coincidence that the MIP was never used.

In the context of EMU, another more subtle element that could complicate the ability of the system to implement the rules is the existence of possible trade-offs between fiscal targets and the goals of the MIP scoreboard in the short term. The latter greatly depends on the competitiveness profile of a country. Improving one country's competitiveness or avoiding the emergence of bubbles, the build-up of debt and other kinds of imbalances (thus assigning a positive probability to the respect of MIP indicators) may have short-term costs in terms of lower growth, thus making fiscal targets more difficult to meet. Such a trade-off should disappear in the long term, but it could continue to be consequential in the current context.

One of the important novelties of the new framework of governance is that some of the key fiscal targets enshrined in national law are defined in structural or cyclically adjusted terms, rather than in nominal terms. In theory, structural targets have the advantage that they make it easier for national automatic stabilisers to work when needed, and to induce member states to build fiscal buffers during upturns. Bova et al. (2014) find partial evidence that some features of 'second-generation' rules, such as the use of cyclically-adjusted targets (like the new set of EU rules) and well-defined escape clauses, together with stronger legal and enforcement arrangements, may be associated with less pro-cyclicality. However, structural indicators, albeit "smarter" in theory, have a fundamental limit in that structural variables[10]

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likely to continue. This implies that the system of fiscal governance may look different in the medium term.

[9] See the European Commission's Communication, "Making the best use of the flexibility within the existing rules of the Stability and Growth Pact", Brussels, 13 January 2015 (http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/2015-01-13_communication_sgp_flexibility_guidelines_en.pdf).

[10] See Alcidi and Gros (2014).

are not observable. They are typically surrounded by a large degree of uncertainty and often subject to large revisions. On the one hand, this makes it very difficult for parliaments to design domestic budgetary policies to comply with targets that may turn out to be wrong few months later. On the other hand, because the potential output is unobservable, policy-makers might be tempted to interpret temporary revenue gains as permanent, leading to higher spending or tax cuts that further fuel booming aggregate demand. Indeed, the IMF (2015) argues that while, from a long-term perspective, symmetry in fiscal responses between good and bad times is important, in reality it does not occur. Uncertainty around the potential output, combined with the fact that a rapidly growing pool of revenues complicates efforts to keep a tight lid on total expenditure, tends to result in a pro-cyclical bent.

For the reasons laid out above, it seems unrealistic to assume that the new fiscal framework will be sufficient to address the tendency towards pro-cyclical behaviour, and we cannot rule out the possibility that member states will be forced to cut-off fiscal stabilisers when faced with large asymmetric shocks. As a result, it is unlikely that fiscal policy will act as a strong stabilisation mechanism.

2.2.1 The 'soft' aspect of governance: Learning by doing

While the current rules-based governance system has proven little success, the soft aspects of the new economic governance should not be underestimated. It can be argued that one of the essential functions of the European Semester is to create a 'learning-by-doing loop', where national policy-makers commit to achieving certain targets and learn to think, develop and implement their economic policies in a coordinated fashion. Thinking about national economic policies as a part of a wider process will become a standardised, natural part of domestic policy-making. The creation of a system of financial incentives for coordination and structural reforms could accelerate such learning. In line with this way of thinking, one could assume that the probability of fulfilling fiscal and economic commitments increases over time as the effect of the learning process of coordination. As it becomes more and more natural to think of one country's economic and fiscal policy as a part of a larger coordination exercise, the probability of respecting the fiscal and economic targets tends to increase.

3.   Labour mobility as stabilisation mechanism

As mentioned in the introduction, labour mobility is one channel for smoothing the impact of shocks. According to OCA theory (Mundell, 1961), the mobility of workers constitutes an important stabilising mechanism in a monetary union. An increase in unemployment in one member state (or a fall in wages) should induce workers to move to other countries; while a shortage of labour supply (or higher wages) should attract foreign workers. In principle, these flows reduce the cost of regaining full employment through a painful and long process of wage adjustment and a long period of unemployment.[11] However, the empirical literature is far from conclusive as regards the effect of labour mobility in Europe.

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[11] The ECB's President argued: "Certainly, greater cross-country mobility would be welcome, and we should encourage measures that facilitate it. But research suggests that it is unlikely that cross-country migration flows will ever become a key driver of labour market adjustment after large shocks. And no country will thrive anyway if its population deserts it." (Draghi, 2014)

As argued in Barslund and Busse (2014), labour mobility has responded very little to the crisis that started in 2010, taking into account its depth and temporal extent, and with a long time-lag, suggesting that this is only a rather marginal tool for achieving the objective of income stabilisation. Yet, recent research on the role of regional mobility as a tool for equilibrating labour markets in the context of monetary unions, in particular comparing the US and the euro area, has emphasised that the role of mobility as a shock absorber somewhat increased during the crisis and became more responsive to unemployment differentials. According to Beyer and Smets (2015), both in Europe and the US, labour mobility accounts for about 50% of the long-run adjustment to region-specific labour demand shocks, but the adjustment takes much longer in Europe. Jauer et al. (2014) find that in contrast to the pre-crisis situation and the findings of previous empirical studies, the mobility response to the crisis has been considerable in Europe, as opposed to in the United States, where the crisis and subsequent sluggish recovery were not accompanied by greater interregional labour mobility. Their estimates suggest that, if all measured population changes in Europe were due to migration for employment purposes, up to about a quarter of the asymmetric labour market shock would be absorbed by migration within a year. In the eurozone, however, the reaction mainly stems from migration of third-country nationals. Even within the group of eurozone nationals, a significant part of the free mobility stems from immigrants from third countries who have taken on the nationality of their eurozone host country.

Arpaia et al. (2014) find that euro-area membership (as opposed to EU membership) did not significantly increase mobility, but it is associated with a stronger reaction to unemployment differentials. In quantitative terms, they find that mobility absorbs about a quarter of a 1% shock to labour demand and this rises to 60% after 10 years. This is lower and slower than in the US.

In the context of the analysis of the different mechanisms for smoothing the impact of asymmetric shocks (which are usually measured relative to a shock on GDP) it would be interesting to compare the role of labour mobility relative to the capacity of other channels. This implies understanding the relationship between changes in GDP and labour demand, which is broadly measured using 'Okun's law'. Such a relationship is difficult to estimate and may vary dramatically across countries. Yet, Anderson et al. (2014) estimate the euro area's aggregate Okun coefficient and find a value of -0.31, which suggests that a 1% fall in GDP growth is associated with a contemporaneous 0.31 percentage point increase in the unemployment rate. Under this assumption, the estimates of Arpaia et al. (2014) and Jauer et al. (2014) suggest that about one-fourth of labour demand shock is absorbed by mobility, which would mean that labour mobility in the euro area absorbs around 0.08% (1/4 of 0.031) of a 1% shock to GDP. This suggests that the role of mobility is limited but, as will be shown later, the magnitude of its importance may be comparable to that of other channels.[12]

4.   Integration of credit and capital markets

In a monetary union, cross-country risk sharing and consumption smoothing are particularly relevant because monetary policy can no longer respond to country-specific shocks, and the

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[12] It should be noted that this is a matter where data availability is still a real issue. The mobility levels of EU, EA and third-country nationals are difficult to distinguish and to capture. In several studies, regional mobility also includes mobility within countries, which may not be relevant to an EUBS.

exchange rate is no longer floating. The empirical literature addressing the measurement of the channels that smooth the effect of shocks across countries in the face of asymmetric shocks has distinguished between the private market channels (international credit and capital markets) and government (tax and transfers from the centre). Under the assumption that markets are complete, capital markets provide full insurance against asymmetric shocks, and is no justification for interregional fiscal transfers (Eichengreen, 1991). This is why it is important to gauge how far financial integration can go in terms of risk-sharing benefits.

The debate on how to make the E(M)U sustainable in the long run is often divided between those who believe that the market should be the main shock absorber, and the camp that argues that fiscal risk sharing arrangements are warranted regardless. In practice, the (political and) economic case for an EUBS also crucially depends on how this question is settled.

Given recent efforts to foster financial market integration, an analysis should not only look at the past, but also include an assessment of the degree of market risk sharing that can be achieved in the future. This implies asking what role the BU and the CMU can play to endow the Union with a capacity to insure itself against asymmetric shocks, and to reduce their occurrence. Working from this perspective, this section will first provide a review of the empirical literature on the channels of international risk sharing in existing federations and in Europe, paying particular attention to the role of financial integration. We then proceed to a forward-looking discussion on the effects that the BU and potential CMU could play in reducing the probability of shocks, and in improving private risk sharing. Finally, we carry out an empirical exercise that consists in comparing the level of risk sharing achieved by the core countries, which remained financially integrated during the crisis, as opposed the non-core. To the extent that the BU and potential CMU will make core and non-core countries more closely integrated, this exercise should provide us with a 'guesstimation' of the future euro area risk-sharing capacity.

4.1 The role of markets and government in smoothing consumption and income: a literature review

The political and academic debate about which channels should be used to smooth the impact of shocks often fails to distinguish risk sharing and consumption smoothing and generally refers to 'international risk sharing'. However, the distinction between the two concepts is crucial. Risk sharing is a concept that relates to the idea of risk diversification and is linked to the existence of different 'states of nature', some good and others bad, that could materialise and the fact that people want to protect themselves against the risk that bad states adversely affect their well-being. In broad terms, (market) risk sharing requires access to international capital markets and occurs either through having a diversified portfolio of international assets or an explicit insurance policy, hence it is based on ex-ante arrangements that kick in automatically to smooth domestic income in the event of a shock. Consumption smoothing posits a consumption choice on different dates, it is an inter-temporal concept according to which individuals (or countries) can maintain a steady level of consumption over time in the face of temporary shocks that may result in fluctuations in income, which in turn can translate into fluctuations in consumption. The buffering of consumption against income shocks usually occurs through savings and borrowings in

international credit markets whereas consumption smoothing is a form of intertemporal risk sharing, albeit cross-country, and it occurs ex-post. Asdrubali et al. (1996) provide an integrated framework to quantify relative inter-state risk sharing for various channels for smoothing shocks. The key channels identified are measured as follows:

- **International capital markets (private risk sharing via cross-ownership of assets or income smoothing)**. This channel relates to international portfolio diversification. The effect of a drop in output in a country on its residents' income directly depends on how much of the country's productive assets (in particular capital) are owned by residents of other regions and how much of foreign productive assets are held by nationals. For instance, if financial intermediaries lend to foreign borrowers, the flow of interest payments from abroad provides a cushion in the lending country.

- **International credit markets (or consumption smoothing or 'inter-temporal' risk-sharing).** Saving and borrowing allow the smoothing of consumption over time through the business cycle, as households and firms, as well as national governments can accumulate assets, save or borrow using the credit market (mostly banks). This is an ex-post mechanism

- **Government redistribution (fiscal risk sharing).** Federal tax, transfers and grants are used in federations to absorb the negative effects of asymmetric shocks

This classification is the usual starting point for measuring the role of the different channels.

4.1.1 The EMU vs. fully-fledged federations

The early empirical literature on risk sharing started in the 1990s and mainly focused on inter-state risk sharing between the US States. Research has focused on the risk sharing provided through federal fiscal transfers. For instance, Sachs and Sala-i-Martin (1991) consider nine US States for the period 1970-1980 and find that net transfers (risk sharing and distribution) made by the federal government absorbed one-third and one-half of the shock. This approach was refined by Bayoumi and Masson (1995) who disentangle the risk sharing component of federal taxes and transfers from their permanent redistribution effects. They find that in the US, the risk-sharing effect of net transfers amounts to around 30%. In Canada, risk sharing through net federal transfers is smaller (17%). More recently, Poghosyan et al. (2014) focus on the role of net fiscal transfers only in Australia, Canada and the US. Their main finding is that fiscal transfers at the central level have little effect in terms of risk sharing. In particular, the impact of net fiscal transfers on risk sharing as a response to asymmetric shocks ranges between 4% and 11%, while a larger impact (between 13% and 24%) is found for inter-temporal stabilisation, i.e. in response to common shocks and a simultaneous fall in output across regions.

In their path-breaking paper, Asdrubali et al. (1996) find that 62% of a shock to a state's GDP is cushioned through the combined role of capital markets (39%) and international credit markets (23%), while federal tax and transfers account for a further 13% (and 25% remains unsmothed). Athanasoulis and van Wincoop (2001) find that around 70% of the shocks in the United States are smoothed through private and public risk-sharing mechanisms. Again, financial markets play the biggest role, allowing around 60% of the total smoothing, while federal fiscal policy covers the other 10%. For Germany, Hepp and von Hagen (2013) find, in the pre-unification period, that the federal tax transfer provided most of the smoothing and

grant system (55%), while for the post-unification period, international factor income flows have become the most important channel, contributing about 51% of total income smoothing.

European Monetary Union triggered new interest in international risk sharing. Clearly, Europe was, and to some extent still is, fundamentally different from these federal states since it lacks a central government with a federal budget, and exhibits a weaker quality and degree of financial integration. Sorensen and Yosha (1998) find that only 40% of asymmetric shocks to output is smoothed among OECD countries, with 50% of the smoothing occurring via government saving and 50% via private saving. The role of the international capital market is found to be non-existent prior to 1999. A more recent study by Furceri and Zdzienicka (2013) considers a panel of euro-area countries over the period 1979-2010 and finds that the euro area stills lacks the degree of risk sharing observed in existing federations. According to their estimates, the share of unsmoothed cross-country shocks in the euro area (EA) is about 60%, much higher than in other federations like US, Canada or Germany where according to past studies (see Asdrubali et al. 1996; and Hepp and Van von Hagen, 2013) it amounts to about 20%.

4.1.2   *Financial integration and risk sharing in the EMU*

In the context of a discussion on the new EMU governance architecture, it is crucial to look more closely at the role that financial integration has played and can play in the future in fostering market risk-sharing (i.e. via capital and credit markets). Indeed, from theoretical point of view (see Mundell, 1973), financial integration can provide important benefits, as it creates opportunities for adapting to shocks by increasing risk sharing and consumption smoothing.

However, when looking at the experience of the euro area, empirical accounts call for some more nuance in drawing conclusions. Kalemli-Ozcan et al. (2010) show that the channels for risk sharing evolved after the creation of EMU. In particular, they find that risk sharing through factor income flows and capital gains was close to zero prior to the introduction of euro in 1999, but it has then increased to 6% for each channels. Kalemli-Ozcan et al. (2008) and Demyank et al. (2007) find that increased holdings of foreign assets and banking integration in the EMU have spurred risk sharing, 'improving ex-post the optimality of the EMU'. However, capital markets remain largely untapped in Europe, if one considers that in the US inter-state risk sharing through factor income reaches 40%. Moreover, Kalemli-Ozcan et al. (2013) find that during the crisis, international factor income did not provide any risk sharing; on the contrary, it may have acted as a shock amplifier. As Allard et al. (2014) point it out, the general explanation for the subdued international risk sharing in the euro area is that the cross-border ownership of assets remains very limited within the union, which reduces the capital markets' insurance. Moreover, Demyank et al. (2007) stress that asset holdings outside the EMU tend to have the largest risk-sharing properties, as their return is more likely to be uncorrelated with the euro area cycle. The latter observation has important implications when it comes to assessing the future impact of a capital markets union and more generally of further integration: convergence in business cycles and correlation in asset returns could also potentially reduce the scope for risk sharing.

Furceri and Zdzienicka (2013) find that the bulk of risk sharing continued to come mainly from the credit channel, through borrowing and savings, since the EMU's creation. Yet, it is unclear whether the higher degree of integration in the interbank market has produced

positive effects in terms of shock absorption capacity. Estimates by Demyank et al. (2007) point to a decrease in the overall international credit smoothing in the five years following the EMU, compared to the five previous years. While there appears to be some variability in the estimated role of the credit channel, the overall trend seems to point to a small decline over 1999-2007. As for the role of public versus private saving, the main finding is that public saving consumption smoothing remained fairly steady after the EMU introduction, while private credit' role has tended to decline. According to Furceri and Zdzienicka (2013), the reduction of private credit as a smoothing factor after the introduction of the euro reflects the fact that credit flows have become less counter-cyclical, even though amounts have increased.

One crucial characteristic of the credit channel is that it tends to be ineffective during crises. Hoffman and Nitschka (2012) argue that the effectiveness of risk sharing channels during prolonged crises tends to differ from periods of normal business-cycle fluctuations. Furceri and Zdzienicka (2013) examine how different types of crises affect risk sharing over the period 1980-2010 and find that risk-sharing via the international credit markets tends to be lowest when it is most needed because (interbank) credit markets have a high propensity to freeze up during crises. Overall, this feature of the credit channel suggests that large shocks can strongly impair consumption smoothing by constraining private and public sector's capacity to borrow. Kalemli-Ozcan et al. (2014) find that international consumption smoothing has remained stable during the global financial crisis in 2008-2009 as the stimulus produced by governments, compensated for the fall in that from private channels. By contrast, the eruption of the sovereign debt crisis in 2010 led to a collapse of the role of governments in responding to shocks. In particular, countries that had run prolonged expansionary policies in the booming years, or had experienced bubbles, were forced to save when the crisis erupted.

Overall, the literature seems to suggest that, in Europe, the capacity to respond to shocks remains weak, as compared to federations, and it is vulnerable during crises. Although there is no doubt that the EMU boosted financial integration, little private risk sharing has taken place. Indeed, large parts of country-specific shocks remain unsmoothed, as the role of the market is relatively small and mainly driven by credit markets, rather than by capital markets, whose functioning tends to be more stable over the cycle. This implies that while the system is endowed with a certain capacity to smooth consumption, it seems unable to ensure sufficient risk sharing during period of important stress. A possible explanation for it is that financial debt instruments, particularly the wholesale funding of banks, rather than cross-country ownership of equity, dominated financial integration in Europe. This has important implications, since capital markets are less subject to reversal (See Box 1) and can absorb loss associated with permanent shocks, whereas intertemporal consumption smoothing can only address temporary shocks (Bolton et al., 2013 and Valiante, 2016).

## Box 1. Financial market (dis)integration during the crisis: equity and debt

Between the creation of the EMU and the beginning of the financial crisis, financial integration, broadly defined as increasing cross-border claims and falling dispersion across market prices, grew to three times its original level at the end of 1998, both in terms of price-convergence and even more in relative terms for quantity indicators (see Figure 3). Nonetheless, the hit taken during the financial crisis of 2008-09 took a heavy toll on the financial integration process, reversing the degree of integration (both in the core and at the periphery). Price-based indicators dropped across the board due to a great divergence of prices and yields, and volumes were affected with the deepening of the sovereign debt crisis and the subsequent segmentation in the interbank market starting in 2011. Indicators of financial integration have started to recover since, both in terms of quantities and prices.

Figure 3. Price- and quantity-based SYNFINT* in the euro area
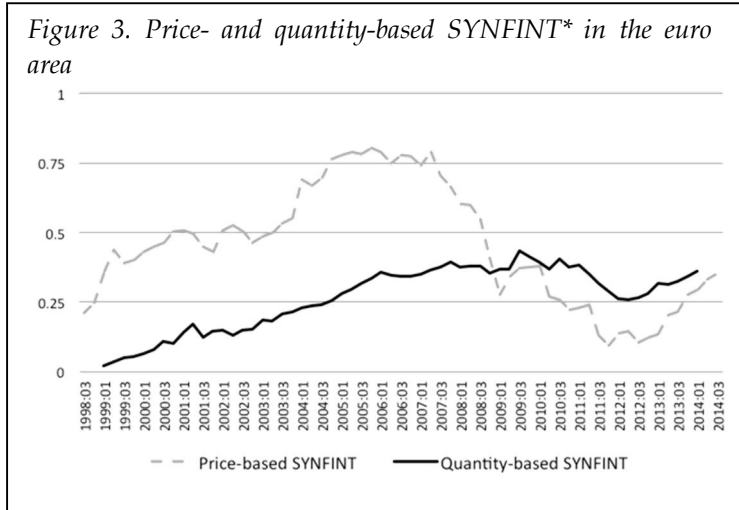
After 2009, the cross-country dispersion of both the cost of borrowing for non-financial corporations and of interest rates on deposits increased substantially and has only narrowed down in recent times. In particular, the gap between the average financing cost in the core and non-core countries dramatically increased over the 2008-09 period, and has only started to narrow since 2015. Beyond the divergence between the core and non-core countries in terms of development of their banks and funding structures, indicators of integration in the debt securities market also point to financial fragmentation. Similarly, the dispersion of sovereign bond yields sharply increased at the height of the EMU crisis, with severe consequences, as we know. Following the introduction of the OMT, the dispersion came back to levels close to what was observed prior to the sovereign debt crisis, but holdings are much lower.

Figure 4 shows that cross-border holdings of debt securities by monetary and financial institutions (MFIs) fell drastically during the crisis in the euro area. This was one of the main manifestations of the financial fragmentation that exacerbated the economic crisis in peripheral euro-area countries, showing that larger cross-border financial flows and large stocks of debt can create instability (Mink and de Haan, 2014). Indeed, euro area member countries' financial systems are heavily bank-centred, while stock and bond markets provide a relatively modest share of the

Figure 4. Share of MFI cross-border holdings of debt securities issued by EU corporates and sovereigns, 2005-14) (%)
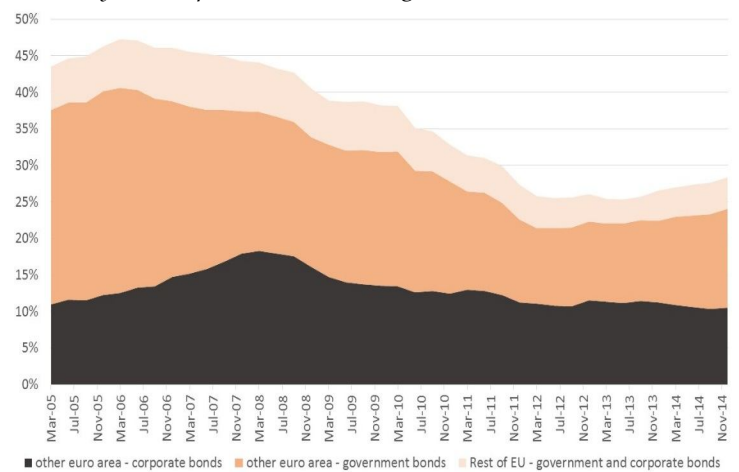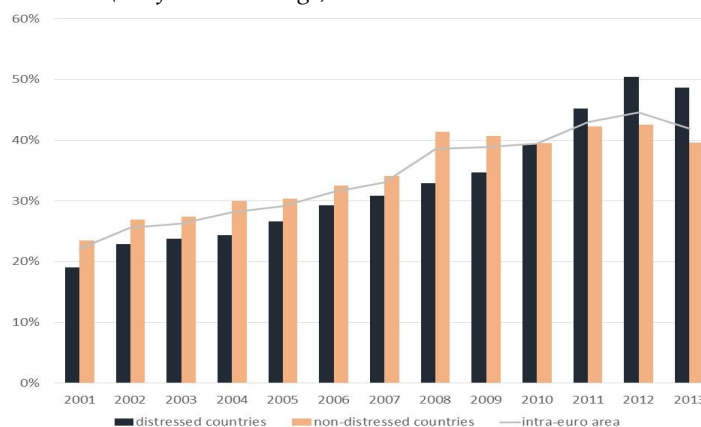

Source: Valiante (2016), based on ECB data

financing to the private sector. In fact, total bank assets account for 283% of GDP in the EU, compared to about 65% of GDP in the US (Fuceri and Zdzienicka, 2013).

Figure 5 shows that cross-border holdings of equity as a share of total equity holdings did not fall. Holdings of equity across the euro area have doubled since the introduction of the euro, both in distressed and non-distressed countries and, importantly, it has exhibited strong resilience to the financial and sovereign crises. Nonetheless, as already pointed out total equity holdings are still limited compared to other financial instruments, especially debt securities. For euro area MFIs, cross-border holdings of equity amount to about 25% of cross-border debt security holdings (based on ECB data).

Figure 5. Cross-border holdings of equity issued by euro-area residents (% of total holdings)

Note: Non-distressed countries are Germany, the Netherlands, France, Austria and Finland. Distressed countries are Italy, Spain, Portugal, Greece and Ireland. *Source*: Valiante (2016), based on ECB data.

4.2 What to expect from Banking Union and Capital Markets Union

As previously discussed, the political and economic case for an EUBS crucially depends on the degree of market risk sharing that can be achieved in the future. A relevant question is thus to ask what role the BU and the potential CMU can play to endow the Union with a capacity to absorb asymmetric shocks. Against this backdrop, this section discusses the expected effects of the BU and CMU. We break down the analysis of the effect of the BU into an ex-ante perspective (risk reduction) and an ex-post perspective (absorbing the impact of shocks).[13] We then proceed to a hypothetical discussion of what would have happened in Spain and Ireland had a banking union been in place at the time. Finally, we discuss the potential impact that a CMU could have on risk sharing.

4.2.1 Banking Union: An ex-ante perspective

The remarkable steps achieved towards the creation of a European Banking Union are arguably the most significant economic policy change since the introduction of the euro. The Single Supervisory Mechanism (SSM), which is the first pillar of the BU, started its supervisory role in 2014. It is expected improve the detection of financial risks, reduce the propagation of shocks and to some extent boost financial integration. A more-encompassing monitoring could thus reduce the frequency of large financial shocks and could affect their nature (transitory versus permanent) and transmission to the real economy.

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[13] Longer-term effects of further financial integration, like the possible impact of very high capital market integration on the bargaining power of labour, go beyond the scope of this analysis and are not addressed.

The BU's functions that relate to the centralisation of monitoring and assessment of risk in the banking sector are supposed to be an important tool for risk reduction. By providing centralised supervision of the banking sector, the SSM should offer a European-wide view of emerging risks in the banking sector. By the same token, it should help overcome problems of coordination among national supervisors, which contributed to the financial fragmentation at the peak of the crisis in the euro area. As an independent supervisor, the ECB is better positioned to pursue long-term stability objectives, in contrast to more political short-term goals, which have affected the behaviour of some national supervisory authorities in the past.

Whereas there are clear potential benefits to adopting a common supervisory framework, it must also be highlighted that not all European banks fall under the new framework of supervision and the BU may not imply a big change for them, at least in terms of early detection of risks. In particular, small banks remain under the national supervisor authority. They will have to follow guidelines imposed by Frankfurt if the national regulator does not abide by the single regulatory framework, but will not be subject to the direct supervision of the SSM. Despite their individual size, small banks, which account for about 15% of EMU banking assets (ECB, 2013), can pose a systemic risk. The experience of Spain proved that this is not trivial - small banks can lead to a large crisis.

Looking ahead, the risks associated with small banks, which may look rather irrelevant when considered in isolation, could be more an issue in Germany than in Spain. Indeed, in Spain many small banks disappeared as a consequence of acquisitions and mergers (e.g. Bankia) and now fall under the SSM. By contrast, in Germany, there are large networks of very small banks, which would escape any changes introduced by the Banking Union, and in an adverse scenario, their tight linkages could lead to a large risk. In principle, one of the tasks of the European Systemic Risk Board (ESRB) is to detect such risks.

Besides the reduction of risk, the BU is also likely to affect equity market dynamics by favouring cross-border banking integration, even though this is likely to be limited in the initial phase. Many banks in Europe that have a cross-border dimension (i.e. they operate in more than one member state) have often encountered difficulties because of the different behaviours of the different national supervisory authorities. National supervisors have had a natural tendency to protect the national champions, limiting de facto cross-border mergers and acquisitions and the formation of multinational banks, despite their commitment to the EU single market. Since prudential supervision has been transferred to the ECB, these barriers no longer exist. The SSM will guarantee the uniformity in the application of the supervision rules and cross-border banks will have a single point of contact. Cross-border equity investments in the banking sector are hence expected to become more frequent. This could work as a stabilising factor during a crisis, as the experience of the Baltic countries has shown.[14]

Similarly, if the BU is successful at limiting the intervention of governments in the countries where the banks are based and at reducing the costs of bank resolution then investors should be better able to compare banks on their own merits rather than according to the judgement of their home country.

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[14] See Gros and Alcidi (2015).

4.2.2   *Banking Union: An ex-post perspective*

From an ex-post perspective, i.e. relating to the absorption of (financial) shocks, the second pillar of the BU – namely the Single Resolution Mechanism (SRM), with a centralised resolution approach and common financial resources (the Single Resolution Fund, or SRF) – is of critical importance.

The crisis revealed the difficulty of operating efficiently without common monitoring and resolution procedures in an increasingly integrated banking sector. As argued by Buch et al. (2015) a bank-based financial system within a monetary union may lead to limited effective private risk sharing across countries, because national supervisors and policy-makers have an incentive to protect their banking system. In particular, they tend to present banking issues as being of a liquidity nature, which often implicitly results in shifting the responsibility for managing the risks to the central bank via its refinancing operations.

In this respect, the common supervision and resolution framework provided by the SSM and SRM, should help significantly to reduce the risk of collective action failures observed during the crisis (Veron, 2014) and should lead to more private risk sharing as the new framework involves a bail-in prior to considering any form of bail-out. Ideally, the common resources should then allow cutting the doom-loop between banks and their sovereigns as resolution is moved to a central level.[15]

In cases where severe problem emerge, risk sharing should occur through bail-in, which would distribute losses among all creditors and not only among capital holders. This should increase the loss-absorption capacity of banks without recourse to common money.[16] In fact, in the current system, the bail-in of creditors is a necessary condition for the intervention of the SRF. If creditors are geographically diversified, bail-in is a tool for sharing losses across borders. This also implies that, since depositors (especially small savers) tend to be domestic, it is essential to safeguard their interests in order to limit the negative impact of the bail-in on the domestic economy. Indeed, if creditors that are to participate in the bail-in are preponderantly residents, local households or other local financial intermediaries, the bail-in can severely harm the domestic economy and aggravate the crisis, leading to contagion throughout the domestic economy. In this case, while public finances are not directly affected, indirect negative effects (erosion of pensions and other savings) may hit the economy, which, in turn, can result in adverse fiscal effects. Under these conditions, the BU cannot help much in terms of loss sharing.

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[15] The strong interdependence that exists between banks and their sovereign states led to the so-called doom loop between sovereigns and their banks. This is the result of the fact that European banks remain heavily exposed to their sovereign due to home bias in terms of domestic bond holdings, and of guarantees – even of an implicit nature – of national governments in favour of domestic banks. This created a strong link between the dynamics of sovereign states' bonds and the cost of funding for banks in capital markets (see IMF, 2012).

[16] In the new framework, before the SRF is used, shareholders and creditors must bear losses of at least 8% of liabilities (based on historical losses). Then the SRF can contribute up to 5% of the bank liabilities. Under such a system, the bail-in of creditors is most likely and larger when banks have low capital relative to total liabilities. It also implies that some banks may be excluded from the SRF recapitalisation because they do not meet the requirements for bail-in.

In this respect, the specific design of the bail-in clauses will matter in a crucial way in defining how much risk sharing they can contribute to.[17] Some uncertainty is likely to remain, if for instance, bail-in implies some conversion of debt into capital. In that case, it is impossible to establish ex-ante how much risk and losses are shared.

Despite the remarkable steps already taken, the BU is still incomplete: it lacks a fiscal backstop for the Single Resolution Fund (SRF) and a common deposit insurance scheme. The delay in the process and the limited size of the SRF (€55 billion[18]) reflect, on the one hand, the reluctance of EMU leaders to pool fiscal resources and, on the other hand, the challenges faced by to recovering from the crisis.

Gros and Belke (2014) note that the SRF is sufficient to deal with individual bank failures or even a domestic systemic crisis in small to medium-sized countries. De Groen and Gros (2015) show that, during the period 2007-14, in the euro area, 72 banks received capital support in the form of state aids. The banks aided (representing approximately 45% of the total euro-area bank assets) experienced total losses of more than €300 billion. Of those 72 banks, more than 30 might have received support under the new mechanism (the SRF and the bank recovery and resolution Directive, BRRD), had it been in place.[19]

By contrast, Schoenmaker (2014) emphasises that without a common fiscal backstop to the SRF, the transmission from bank to sovereign will not be cut in the case of large crisis. In other words, the banking union, in its current state, would not be able to handle a systemic crisis. Indeed, losses of failing banks can be very large and both bail-in and the SRF interventions may turn out to be insufficient[20] to cover all losses[21] and prevent the burden to fall on possibly weakened sovereigns. In this respect, a common deposit guarantee scheme or a reinsurance scheme for national deposit insurance schemes (Gros, 2013) could be of crucial importance for the stability of the financial system and its resilience to systemic events [22](see Gros, 2015). In the absence of this element, it would be illusory to expect the BU to have the same effects as the Federal Deposit Insurance Corporation (FDIC), which features both a common resolution system, and common deposit insurance backed by the US government. While there is no explicit backstop, one can argue that the ESM is already a sort

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[17] A bail-in of creditors is a mechanism either to cancel/reduce liabilities of failing banks or to restore a bank's capital position by converting its debt into equity; this can follow different modalities.

[18] From 2016 onwards, the SRF will collect the funds for the recapitalisation of euro-area banks. The fund has a target level of 1% of covered deposits, which the European Commission estimated to equal about €55 billion. Euro-area banks will have to pay a risk-adjusted annual premium (on average 12.5%) of the target level. In the period 2016-23, the fund will raise approximately €6.9 billion per annum. If ex-ante contributions were to be complemented with ex-post contributions, the maximum firepower of the fund could be increased by €20.6 billion to €75.6 billion. See De Groen and Gros (2015) for more details on the estimates of the bridging needs and the SRF.

[19] See De Groen and Gros (2015) for a detailed analysis.

[20] See De Groen and Gros (2015).

[21] See Gros (2014b).

[22] This gives rise to complex political economy implications as this presupposes the creation of a common pool of resources and would eventually involve some degree of fiscal risk sharing. As reflected in the current debate between the Northern and Southern member states, going forward in that direction is likely to require reducing the exposure of sovereigns to their own bank.

of implicit fiscal backstop, and could serve in the direct recapitalisation of banks if a sovereign state is not able to fund itself.

Finally, from a broader point of view, breaking the sovereign-bank nexus and reducing the differences in supervisory activities are also key steps for monetary policy as they should help repair the transmission mechanisms of ECB monetary policies. During the crisis, financial fragmentation was driven by the sovereign–bank doom loop, and low interest rates were not transmitted to those member states hit the hardest by the crisis, thereby cancelling out the ECB's actions to stimulate those economies.

4.2.3 *Banking Union and the housing bubbles in Ireland and Spain*

To illustrate the importance of BU in the case of financial asymmetric shocks, one can conduct the thought experiment of how the boom-bust cycles in Ireland and Spain would have played out, if the SRM had been fully operational (i.e. after the end of the transition period).

From the ex-ante point of view, it makes little sense to assume that the SSM would necessarily have detected the presence of a housing bubble. However, it is reasonable to believe that the SSM and the European Systemic Risk Board (ESRB) would have been much more likely than a local supervisor to warn banks about excessive real-estate valuations, thus imposing limits on over-lending. Admittedly, dealing with a bubble is always very difficult. The experience of advanced economies from Japan to the US, but also China more recently, shows the great difficulty in detecting bubbles ex-ante and even more so, taking the political decision to intervene to stop them in a booming economy. This suggests that while prudential macro policies are certainly useful and important, the assumption that boom-bust shocks will no longer happen is not realistic. The more realistic expectation is that the presence of the SSM should reduce the likelihood that busts pose a risk of triggering a sovereign default.

When the real estate bubble turns into a bust and the local banks get into big difficulty, as occurred in Ireland, the ECB would be expected to flag the banks in difficulty to the SRF, which would then decide whether to allow them to fail and put them into resolution or whether to save them because of their systemic nature. The funds needed to save any bank (or enable an orderly resolution) would have come from the SRF first, instead of coming entirely from the national government, as was the case in 2011. Thus, the SRF should have prevented the feedback loop between bank and sovereign.

Importantly, the potential financial intervention of the SRF would have probably been lower in cost than the losses incurred by the Irish government because the bail-in rules, under the BRRD, mandate that public funds can be provided only if shareholders but also (some) creditors have accepted a loss. This did not happen in Ireland. At that time, the entire euro-area banking system was in difficulty and it was thought that letting any Irish banks fail would have sparked another panic, comparable to the one that followed the failure of Lehman Brothers in the autumn of 2008 (Gros and Belke, 2014).

The Irish government would have had to participate 'automatically' only in the costs associated with banks where losses were so large that the national deposit insurance scheme

had to intervene to guarantee that no insured depositor made a loss.[23] The case stresses again the need for soundly capitalised banks and credible deposit insurance schemes.

The experience of the boom and bust in Spain was different from that in Ireland, owing to the structure of its banking sector, but also because there was a certain consensus at EU level that the Irish scenario had to be avoided. One of the key features of the Spanish banking sector before the crisis was its strong market segmentation. The industry was characterised, on the one hand, by a few very large, internationally diversified banks, which remained almost unaffected by the crisis and, on the other hand, by many small, local banks (*cajas*). This large number of (regional, semi-public) savings banks had lent heavily to property developers and the bursting of the bubble essentially bankrupted them. Given the large number of banks involved, the losses were widely dispersed across the industry and nationalisation was not considered a reasonable option. In Ireland, where losses were highly concentrated in two financial institutions, nationalisation was the immediate solution. In Spain, several small banks were merged (to create Bankia), and Spain was offered a credit line (up to €100 billion) to proceed to a thorough restructuring of the banking sector. If the current framework had been in place, existing funds in banks, the bail-in of creditors and the SRF[24] would have absorbed three-quarters of the estimated losses, implying a much smaller intervention on the part of the Spanish government.

Overall, the experiments suggest that, on the one hand, the BU framework should prevent banks from taking excessive risks and force private risk sharing through contributions from the banking industry to the SRF. On the other hand, it should also protect, at least partially, sovereigns from domestic bank failures, by transferring part of the risk to debt- and capital holders.

The degree of risk sharing that ultimately develops will depend not only on the effect that the BU has on financial integration but also on the effect of the CMU.

4.2.4   *Capital Markets Union*[25]

The aim of the CMU project[26] is to bolster integration in capital markets and to move towards a more market-based financial system. If successfully achieved, this could have a substantial impact on the risk-sharing capacity of the monetary union. As argued above, there is no doubt that EMU has bolstered financial integration in the euro area, but this happened only in certain market segments. Financial integration relied heavily on interbank credit markets (Fecht et al., 2012; Lane et al., 2008) and when the crisis erupted, the euro area

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[23] See De Groen and Gros (2015) for a simulation exercise of the probable distribution of losses by six Irish banks, if the new system of resolution (and the €55 billion of the SRF) had been in place. The paper shows that about half of the losses (more than €60 billion) would have been covered by the banks' own funds, the bail-in and the SRF.

[24] De Groen and Gros (2015) show that for the 13 Spanish banks considered for the simulation exercise, the SRF alone would have contributed about €30 billion of the €70 billion in estimated losses.

[25] See Valiante (2016) for an extensive analysis of the Capital Markets Union, also including its potential impact on risk sharing.

[26] On 30 September 2015, the Commission launched the Capital Markets Union Action Plan to build a true single market for capital (see http://europa.eu/rapid/press-release_IP-15-5731_en.htm). While the Action Plan has prompted substantial debate, the transition towards a complete Capital Markets Union is likely to take several years.

was still far from being a true single financial market. In fact, it still is far from it. The crisis has shown that credit flows can abruptly stop and even reverse, especially if claims are unequally distributed and inflows are concentrated, as was the case in peripheral member states of the euro area until 2010. The sudden stop to lending experienced by several countries, from the Baltic States to Greece, provides ample evidence of this phenomenon.

Overall, the experience of the crisis suggests that the dominant role of banks and debt may be a source of vulnerability. According to Fuceri and Zdzienicka (2013) the lack of capital market integration and the bias towards banks are precisely the factors hindering further risk sharing in the euro area.

In contrast to debt instruments, equity flows, either in the form of investment portfolios or (even more so) in the case of foreign direct investment, tend to be more stable and less likely to be quickly reversed in the event of a crisis because they are more costly to liquidate. FDI flows are indeed more sensitive to information specifically related to a certain project or country than to the global market sentiment.

As discussed above, the issue of cross-country capital/equity ownership is relevant for risk-sharing purposes in the case of banks, but more broadly in the case of companies. In fact 'true' market risk sharing in the case of asymmetric shocks can only be increased if the ownership of capital is geographically diversified. This is one of the purposes of the CMU. The CMU is still in the proposal stage and it is difficult to predict its progress in the medium term. Yet two observations can be made at this point. On the one hand, given the low starting level of capital market insurance, there is a lot of room for improvement. On the other hand, given the very high number of small- and medium-sized enterprises and family-run companies, where the participation of foreigners in providing capital is either impossible or very difficult, US levels are unlikely to be a realistic benchmark against which to evaluate EMU any time soon.

It is worth mentioning that while financial integration can be beneficial from several points of view, it carries risks. When financial integration occurs, policies and the regulatory framework should ensure the elimination of barriers to the circulation of capital in order to have a fully-fledged cross-border market but also to avoid excessive concentration of holdings in some parts of the system and excessive leverage. Market mechanisms alone are usually insufficient to manage risk, especially when the level of integration is very high. Indeed, markets and financial institutions can be subject to self-fulfilling prophecies (Allen and Gale, 1998) accelerated by fast movements of capital, which may quickly affect liquidity conditions both of banks and financial markets. This can lead to more easily spread contagion in the event that a large financial crisis erupts. If the shock is large and not quickly absorbed by the system, there is a risk that it will become systemic and the adjustment costs for the real economy will become very large.

Large cross-border claims can mitigate the local impact of financial shocks (as happened through the presence of foreign banks in the Baltic States), but they can also propagate shocks to the overall financial system. A strong presence of foreign banks can transmit financial shocks abroad to the domestic economy if the foreign banks operating are not sufficiently resilient or if they just cut their exposure.

An example of the mitigation of financial shocks occurred at the beginning of the global financial crisis when some large banks from some euro-area member states started to pull

back capital and credit lines from their subsidiaries in Central and Eastern Europe. These banks were mostly based in countries with relatively weak fiscal and balance-of-payment positions or were very large relative to the size of their home country, such as Italy, Austria and Belgium (Gros and Belke, 2014). The 'Vienna initiative' in 2009, stopped the action. The key stakeholders agreed to prevent a large-scale and uncoordinated withdrawal from the region and committed to maintaining their exposure as well as to recapitalising their subsidiaries. The opposite could have triggered a systemic bank crisis.

An example of the propagation of the shock through cross-border bank exposure occurred on a large scale after 2010. Banks from core, euro area countries started to cut their exposure vis-à-vis sovereigns and other banks located in the periphery. Since the cross-border exposure did not entail capital (unlike for those banks involved in the Vienna imitative) the decision to cut was easy and fast. Moreover, unlike for the Vienna initiative, there was no coordinated action to avert the liquidity crisis.

Another risk associated with high financial integration relates to production specialisation.[27] As movements of capital become easier, production tends to specialise according to comparative advantage.[28] In the case of banks,[29] this can result in higher systemic risks. In the case of manufacturing and other industries, it could result in a situation where different regions of the Union are prone and, in principle, vulnerable to different output shocks, hence increasing the likelihood of asymmetric shocks for which price and wage adjustment are inevitable.

4.3 'Guesstimating' future shock-smoothing properties of EMU: An exercise based on the experience of core EMU countries

Assuming that the BU and the CMU will provide the euro-area capital markets with a capacity to absorb losses that is comparable to that in the US does not seem appropriate. As mentioned earlier, estimates suggest that about 40% of a GDP shock in the US is absorbed by international factor income, while the same is currently negligible in the EMU. The US is an interesting benchmark but given its large experience as a monetary and banking union and federal state, it is unrealistic to assume that any plausible change in the EMU could lead to similar features. At best, the US capacity is an upper-bound benchmark. This is especially the case once the idea that market-based insurance mechanisms do not operate independently of fiscal risk sharing (non-existent in the EMU but functioning in the US) is taken into consideration.

This section complements our analysis with an empirical exercise that could be thought of as a 'guesstimation' of the degree of risk-sharing that could be achieved in the euro area if the BU and CMU led the whole region to reach a similar degree of integration to that of the core countries. We start from the observation that the crisis played out differently in core northern euro-area countries and in the euro-area periphery: core countries remained financially integrated during the crisis, while financial markets in the periphery became

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[27] See Krugman (1991) and the core-periphery patterns theory and OECD (1999) chapter 4.

[28] If higher mobility of capital lead to increasing return on capital, this will tend to depress the labour share of income and hence in the long term the bargaining power of labour.

[29] See Fecth et al. (2012).

again national as fragmentation ensued. Core countries are defined as Germany, Belgium, the Netherlands, France, Finland and Austria. We define the non-core as Portugal, Ireland, Italy, Greece, and Spain.

The hypothesis we want to test is whether the fact that core countries have been highly integrated for a long time, both from an economic[30] and financial[31] point of view, improved their capacity to smooth the impact of shocks relative to the peripheral countries. In particular, the fact that both credit and equity markets remained integrated even at the peak of the crisis could be seen as the outcome one might expect in the presence of the BU[32] and the CMU. If this is the case, the degree of market risk sharing that occurred in the core countries during the crisis should provide us with an estimate of what to expect in terms of market insurance in the future EMU as whole.

4.3.1 Empirical analysis: the experience of the core and non-core countries

In this analysis, we propose to estimate the different channels through which the smoothing of shocks is achieved in the two groups of countries separately. This exercise is based on the approach proposed by Asdrubali et al. (1996) and relates to a recent contribution by Kalemli-Ozcan et al. (2014).

Following the methodology of Asdrubali et al. (1996) and Sorensen and Yosha (1998), we undertake a variance decomposition of shocks to GDP in order to quantify the share of smoothing achieved via the various channels identified above. We disaggregate GDP into the following national accounts aggregates: Gross National Income (GNI), National Income (NI), Net National Disposable Income (NNDI) and total consumption (C+G). From these aggregates, we identify the following channels through which GDP shocks are smoothed

GDP-GNI =*international income transfers (factor income flows)*
GNI-NI = *capital depreciation*
NI-NNDI = *net international taxes and transfers*
NNDI-(C+G) = *total (private and public) net (of investment) savings*

We consider the following identity:

$$(1) \ GDP_i = \frac{GDP_i}{GNI_i} \frac{GNI_i}{Ni_i} \frac{Ni_i}{NNDI} \frac{NNDI_i}{CONS_i} * CONS_i$$

Taking the first difference and transforming (1) into a logarithm, we obtain the following five equations, which come down to a simple variance decomposition of GDP into five factors: [33]

$$International \ factor: \Delta \log GDP_{i,t} - \Delta \log GNI_{i,t}$$
$$= a_t^{if} + \beta^{if} \Delta \log GDP_{i,t} + \varepsilon_{i,t}$$

$$Capital \ depreciation: \Delta \log GNI_{i,t} - \Delta \log NI_{i,t}$$
$$= a_t^{d} + \beta^{d} \Delta \log GDP_{i,t} + \varepsilon_{i,t}$$

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[30] It should also be added that Germany and its surrounding countries (e.g. Belgium, the Netherlands and Austria) are also economically (production and trade) very integrated.

[31] Unfortunately, data on capital market integration among countries are not readily available and building an indicator of it would be methodologically challenging.

[32] Of course, these countries did not have common supervision or resolution mechanisms.

[33] See Furceri and Zdzienicka (2013) for a detailed derivation.

$$\textit{International transfers}: \Delta \log NI_{i,t} - \Delta \log NNDI_{i,t}$$
$$= a_t^t + \beta^t \Delta \log GDP_{i,t} + \varepsilon_{i,t}$$

$$\textit{Total net savings}: \Delta \log NNDI_{i,t} - \Delta \log CONS_{i,t}$$
$$= a_t^s + \beta^s \Delta \log GDP_{i,t} + \varepsilon_{i,t}$$

$$\textit{Total consumption}: \Delta \log TOT\ CON_{i,t} = a_t^c + \beta^c \Delta \log GDP_{i,t} + \varepsilon_{i,t}$$

a_t denotes the time-fixed effects, the β_s capture the percentage of smoothing achieved by the different smoothing channels and $\varepsilon_{i,t}$ is the error term. Note that no constant is included in the estimation. These equations aim to capture how GDP shocks propagate through the economy. The sum of all β_s, for a certain time, equals one by construction. In particular, if β^c= 1 (the coefficient for consumption), the impact of a shock to GDP is fully absorbed by consumption, meaning that no risk sharing takes place. Conversely, if β^c= 0 risk-sharing mechanisms provide full stabilisation to a shock, with no impact on consumption.

All data are from the OECD national accounts database and are measured in per capita (real) terms. We consider a panel of 11 countries that were part of the euro area in 2014[34] over the period 1990-2014. In order to evaluate the effectiveness of risk-sharing mechanisms during the pre-crisis years (1990-2007), the global financial crisis (namely 2008-09) and the euro area crisis (2010-14), we allow the coefficients to vary by interacting the GDP shocks with dummy variables for the three different time-periods. Moreover, in the same vein as Kalemli-Ozcan (2014), we further interact the GDP shocks with dummies for the core and non-core country groups, which allows us to test our initial hypothesis. Therefore, the general equations presented above are extended in the following way (here with the example of international factor income on the left hand side):

$$\begin{aligned}
\Delta \log GDP_{i,t} - \Delta \log GNI_{i,t} = a_t \ &+ \beta^{core\ 90-07} \Delta \log GDP_{i,t} * D_{i,t}^{90-07} * D_{i,t}^{Core} \\
&+ \beta^{Non-Core\ 90-07} \Delta \log GDP_{i,t} * D_{i,t}^{90-07} * D_{i,t}^{Non-Core} \\
&+ \beta^{Core\ 08-09} \Delta \log GDP_{i,t} * D_{i,t}^{08-09} * D_{i,t}^{Core} \\
&+ \beta^{Non-Core\ 08-09} \Delta \log GDP_{i,t} * D_{i,t}^{08-09} * D_{i,t}^{Non-Core} \\
&+ \beta^{core\ 10-13} \Delta \log GDP_{i,t} * D_{i,t}^{10-13} * D_{i,t}^{Core} \\
&+ \beta^{Non-core\ 10-13} \Delta \log GDP_{i,t} * D_{i,t}^{10-13} * D_{i,t}^{Non-Core} + \varepsilon_{i,t}
\end{aligned}$$

We thus estimate five equations, with each of them distinguishing between the three key time- periods and core and non-core countries. This leads to six series (rows) of estimates, which we report in Table 1.

Table 1. Core vs. non-core estimates

Core versus Non-Core	Net savings	International factor income	K depreciation	International transfers	Unsmoothed (consumption)
Core (1990-2007)	0.63***	-0.06*	-0.12***	0.03**	0.52***
	(0.07)	(0.03)	(0.02)	(0.01)	(0.05)
Core (2008-09)	0.61***	0.26***	-0.05	-0.00	0.18
	(0.19)	(0.10)	(0.05)	(0.03)	(0.14)
Core (2010-2014)	0.72***	-0.06	-0.13***	-0.07	0.54***
	(0.23)	(0.12)	(0.05)	(0.07)	(0.15)

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[34] Some countries were not included due to data unavailability. We have left out Cyprus and Luxembourg, given the special features of their banking sectors.

Non-core (1990-2007)	0.24***	0.09**	-0.01	0.03**	0.65***
	(0.06)	(0.04)	(0.01)	(0.01)	(0.05)
Non-core (2008-09)	0.38***	-0.02	0.02	-0.03	0.65***
	(0.14)	(0.10)	(0.04)	(0.03)	(0.11)
Non-core (2010-14)	0.12*	0.03	-0.11***	0.01	0.94***
	(0.07)	(0.05)	(0.02)	(0.02)	(0.06)
Observations	275	275	275	275	275
Adjusted R-squared	0.59	0.19	0.56	0.14	0.88
Number of countries	11	11	11	11	11

Note: Core= Germany, Netherlands, Belgium, Austria, Finland and France; non-CORE= Italy, Spain, Portugal, Greece and Ireland.
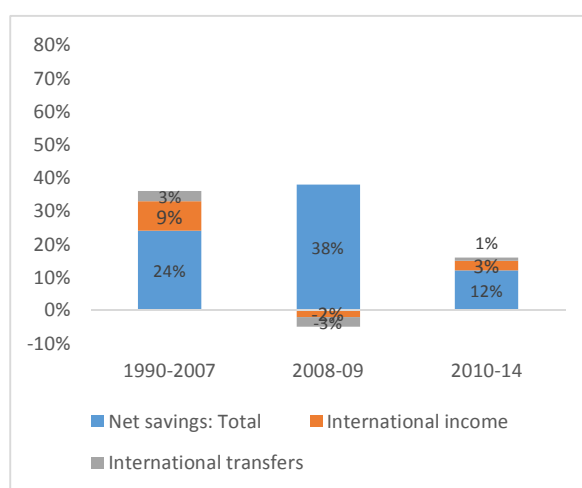
Source: Authors' own elaboration, based on OECD national accounts data (2015).

Figures 6 and 7 visualise the result of the table, for an easier reading.

Figure 6. Core countries: decomposition (1997-2014)

Figure 7. Non-core countries: decomposition (1997-2014)

Source: Authors' own elaboration, based on OECD national accounts data (2015).

Overall, the unsmoothed impact of the shocks, as measured by the consumption coefficient, is much larger in the non-core countries than in the core group of countries across each period. GDP loss absorption seems to have worked particularly well in the core countries during the global financial crisis, when the part of impact of the shocks remained unsmoothed is below 20% (and statistically non-different from zero). In the non-core countries, the shock absorption collapsed after 2010, with the shock on GDP almost fully reflected in consumption (more than 90%). The estimates also suggest that both in core and in peripheral countries, the credit channel has been the only one to mitigate the effect of shocks on consumption, through savings and borrowing. Not surprisingly, this channel has worked in a much more powerful way in the core countries, where savings were larger than in the periphery.[35]

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[35] In this setting, the unsmoothed part of the shock will affect total consumption, both public and private. It is possible to decompose the so-called credit (or better saving) channel distinguishing private and public sector, so to measure the effect of the shock on private consumption only and to capture the role of fiscal policy as consumption smoothing mechanism. Because of data availability,

With one exception, international factor income is either insignificant or very small and with an unexpected negative sign. International factor income smoothed 26% of the shocks in the non-core countries during the years of the global financial crisis (2008-2009): it is the only case where capital markets seem to have provided some loss-absorption capacity. It is interesting to note that when Finland is taken out from the core group, given the crisis it experienced, the positive and significant coefficient of the factor income over the period 2008-09 becomes statistically insignificant. This would suggest that the factor income channel has been particularly relevant for Finland. The result is consistent with the story that Nokia, which was at the origin of the crisis, was not fully owned domestically and the losses of the collapse were shared with other countries.

Overall, assuming that the factor income channel is properly measured, even the countries that remained financially integrated and exhibited strong trade linkages showed, only occasionally, a limited capacity for real market risk sharing: at best, the effect of shocks on consumption was smoothed over time through changes in the composition of demand (investment and savings) /or international borrowing.

Table 2 reports the estimates for the different channels for all 11 countries, without distinguishing between core and non-core. The results are very close to those of the non-core group, reported in Table 1, which seems to drive the main dynamics, over each of the periods considered. Accordingly, the impact of the shock on aggregate consumption is very large, especially after 2010, and credit markets have only had a limited role in smoothing the impact of the shock.

Table 2. Pooled estimates (all countries)

All	Net savings	International factor income	K depreciation	International transfers	Unsmoothed (consumption)
1990-2007	0.35***	0.05	-0.04**	0.03**	0.61***
	(0.06)	(0.04)	(0.02)	(0.01)	(0.04)
2008-2009	0.42***	0.04	0.01	-0.03	0.56***
	(0.15)	(0.10)	(0.04)	(0.03)	(0.11)
2010-2014	0.17**	0.03	-0.11***	0.01	0.91***
	(0.08)	(0.05)	(0.02)	(0.02)	(0.06)
Observations	275	275	275	275	275
Adjusted R-squared	0.52	0.11	0.48	0.13	0.86
Number of countries	11	11	11	11	11

Source: Authors' own elaboration, based on OECD national accounts data (2015).

It should be noted, that beyond the broader discussion on the validity or not of the assumption that output shocks are fully exogenous, assessing the quality of capital market risk-sharing through international factor income has two limitations that may result in a mis-estimation of the level of risk sharing between the groups of countries under consideration. First, net international factor income, as measured above, is not related to the degree of risk

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this decomposition is only possible after 1997. In order to present results from 1990, we do not display this additional decomposition. In broad terms, the simple regressions we run suggest that fiscal policy payed a limited role in the core countries and no role in the periphery. This topic deserves more in-depth analysis.

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sharing occurring within a specific group of countries (i.e. within the core and non-core). It would be correct if the euro area were a closed economy. In reality, it captures the level of risk sharing of each of the countries compared with the rest of the world. As argued by Kalemli-Ozcan (2010), it is likely that the risk sharing properties of assets held outside Europe are very relevant since business cycles tend to be increasingly correlated in the euro area. This implies that the risk-sharing capacity of the euro area, as measured by international factor income is overestimated. However, Balli et al. (2012) remark that measuring only capital income overlooks capital gains, which are another important source of risk sharing through capital markets. This would suggest that factor income is, in reality, underestimating the risk sharing capacity of capital markets.

### 4.3.2 *The role of cross-border equity during banking crises: The BELLS vs. Spain and Ireland*

In order to consider further how financial market features influence risk-sharing, we extend the analysis above by looking at the risk sharing that occurred through international factor income, focusing on a group of countries, that up to 2008, experienced large inflows of capital, in some case combined with bubbles, and then a sudden stop in lending. These are Ireland and Spain on the one hand, and the Baltic States and Bulgaria (BELL) on the other. The Baltics only recently joined EMU, but at the time the crisis erupted, similarly to Bulgaria, they had in place a currency board, or hard peg agreements, which make them similar to euro-area countries to the extent that they could not use the exchange rate as a safety valve.[36]

A very specific and dominant feature of the BELL banking system is that it is mainly composed of subsidiaries from foreign banks (about 80%).[37] This can be seen as an extreme case of cross-border ownership and a possible interpretation of it is that banks in these countries are de facto part of a 'private' banking union (with parent banks in foreign countries). Moreover, since the national central banks were greatly constrained by the exchange rate regime in the provision of liquidity to support their banking systems during the crisis, the BELL experience can provide a lower-bound proxy of the BU. It is interesting to note that despite the magnitude of the losses incurred by the banking system; only one (domestic) bank had to be rescued over the crisis – the only large domestic Latvian bank.

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[36] See Gros and Alcidi (2015).

[37] Ibid.

Figure 8. BELL (Baltic states + Bulgaria): International factor income and GDP fluctuations during the crisis
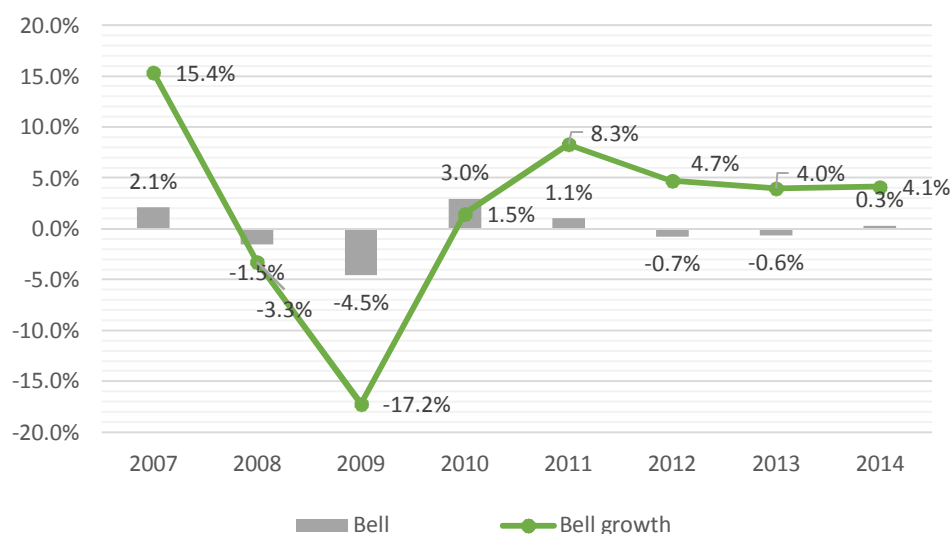
Source: Authors' own elaboration, based on Ameco data, European Commission, 2016.

Figure 8 attempts to roughly illustrate the amount of risk-sharing that occurred through international factor income in the BELL, by plotting fluctuations in GDP and in international factor income.[38] The two variables exhibit a positive correlation (which is analogous to the positive regression coefficient in Table 1) during the worst phase of the crisis, suggesting that international factor income was working as risk sharing. In particular, the latter fell into a negative area in 2008 and 2009 when GDP collapsed. The numbers suggest that some 20% of GDP losses were absorbed by international factor income, in practice losses borne by mother banks and groups outside the region.

Similar to Figure 9, Figure 10 shows GDP and international income factor fluctuations for Ireland (left-hand side) and Spain (right-hand side). Unlike for the BELL, the correlation sign is less clear-cut. In Ireland, the income factor exhibits much higher volatility than in Spain and the correlation with GDP has a negative sign in 2009 and in 2013-14, suggesting that instead of providing cross-border loss-sharing, the factor income reinforced (or was driven by) the cycle. In Spain, the correlation is clearly positive most of the time, and between 2009 and 2013, the international income factor seems to have provided some loss-absorption capacity. In this respect it is interesting to recall that, as argued above, the Spanish banking sector has always been highly segmented with small local banks and large international banks seriously exposed to foreign markets, most notably Latin America. This may have helped in absorbing GDP losses.

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[38] Given the small sample, it is impossible to conduct an econometric analysis.

Figure 9. International factor income (change as % of GDP) and GDP growth, 2007-15, Ireland (LHS) and Spain (RHS)

Source: Authors' own elaboration based on Ameco data, European Commission, 2016.

Overall, the findings seem to point to the fact that a CMU, which is expected to favour cross-border ownership of capital, could play a role in reinforcing the very weak factor income channel. However, market risk sharing should not be expected to reach the range estimated for the US in the medium run, and requires more than harmonisation of regulations to reach such levels.

5. Centralised fiscal insurance and private risk sharing: substitutes or complements?

We distinguish at least two readings of the literature discussed above in terms of what financial integration, driven by the BU and the CMU, could achieve in the area of risk sharing, and hence the need for a fiscal risk-sharing device. On the one hand, because of the nature of past financial integration and the fact that crises tend to affect the credit channel (e.g. sudden withdrawal), strengthening capital market integration would yield large benefits.[39] Unlike the credit channel, the capacity of capital markets for risk sharing during (asymmetric) downturns is expected to remain strong if ownership of capital is highly diversified[40]. According to this line of reasoning, the large gap in the degree of risk sharing through capital markets between the EU and existing federations suggests a high potential for further financial integration gains.

On the other hand, there is no clear evidence that the financial integration that took place since the inception of EMU has fostered private risk sharing. In fact, there is evidence that shocks are least absorbed during major downturns such as the euro-area debt crisis. While the BU and the CMU may contribute to a more resilient financial integration based on market instruments, and could reinforce the effectiveness of banking intermediation, it

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[39] See, for instance, Hoffman and Sørensen (2012).

[40] This requires that the returns on assets held abroad are uncorrelated with country's domestic cycle. If this is not the case there is no scope of diversification and hence risk sharing.

remains to be seen to what extent this would ever lead to a substantial degree of risk-sharing capacity. In this respect, an important question relates is whether improved knowledge of, and trust in, foreign individuals and institutions[41] is a necessary condition for a well-functioning market risk sharing in the euro area. A second question is how other paths of integration, for instance common fiscal insurance, can interact with and affect private risk sharing mechanisms.

The rest of this section seeks ask whether fiscal and private risk sharing are substitutes, or rather complementary instruments for responding and adapting to shocks.

5.1.1   Rationale for fiscal insurance

The recent debate on EMU economic governance has largely focused on how to foster the counter-cyclicality of fiscal policy. One option would be to increase the flexibility of fiscal rules to allow more room for national governments to face the cycle. This is currently happening, at least to a certain extent, but at the cost of breaking the credibility of rules. Another option is to consider the possibility of centralised resources for income stabilisation purposes.

Conceptually, the argument for a (supranational) fiscal capacity or insurance at central level, such as an EUBS, goes even beyond the capacity, constrained or not, of national policy makers to address country-specific shocks. Indeed, the rationale for common fiscal instruments is linked to the notion of externality in a monetary union, which implies that a shock in one country can spill over other countries given the existing tight links (commercial, financial and monetary) among them.[42] In fact, this is also the economic rationale for coordinating national fiscal policies. The key practical distinction is that fiscal insurance at central level would operate ex-ante, and would have the double objective of relieving a country hit by a shock from the costs it entails domestically and avoiding that the shock amplify and be transmitted to other countries.

The key policy and political issue is whether fiscal insurance is a substitute or a complement for market insurance mechanisms.

5.1.2   Fiscal and market insurance: Substitute or complement?

The question is as important as it is difficult to answer. Both economic theory and empirical evidence on the interaction between the market and fiscal mechanisms are scant.

From a theoretical point of view, one answer to this question can be found in Fahri and Werning (2012). They argue that even under the assumption of complete financial markets, the level of risk sharing achieved through private markets is not Pareto efficient. The main reason for this is that private agents do not purchase efficient amounts of private insurance because they do not internalise the positive externalities from the macroeconomic stabilisation effects of their portfolio choices. Under this assumption, a fiscal insurance mechanism would be the response to a market failure and lead to a Pareto superior outcome. This conclusion points to a complementary role for an (ex-ante) fiscal risk-sharing

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[41] Ekinci, Kalemli-Ozcan, and Sorensen (2007) find that variables related to social capital provide further insight into patterns of private risk sharing in the EU. They point out that this kind of obstacles to risk sharing may be harder to overcome than formal barriers to economic and financial integration.

[42] For a review of the literature on the spillover effect in a monetary union, see Alcidi et al. (2015).

mechanism, which goes beyond crisis times when fiscal intervention can compensate for the ineffectiveness of credit markets in smoothing. This argument embeds the idea that fiscal and market channels are not independent, and fiscal risk sharing could act as a catalyst towards the provision of higher market risk sharing. To put it simply, if investors knew that the government was providing a minimum level of insurance against negative shocks, they might be more willing to provide more insurance through market-based mechanisms. This hypothesis has powerful intellectual implications and goes in the direction of arguments often used in behavioural economics; however, it is very difficult to test empirically.

In terms of empirical evidence, one of the few works openly addressing the question of the interaction between risk-sharing channels is that of Asdrubali and Kim (2004). They look at the US, the OECD and the EU over the period 1960/63 to 1990 using a dynamic approach (panel VAR) to analyse the interaction between risk sharing (fiscal or through financial markets) and inter-temporal consumption smoothing (through the credit market) channels. The first finding is that the capital markets and fiscal risk-sharing channels tend to be complementary. The second finding is that they tend to crowd out (or to reduce the role of) the credit channel. This is an important result given that the effectiveness of the credit channel varies with the cycle. They also find that a positive shock to capital markets would crowd out credit market smoothing (almost completely in the US and partially in the OECD). This would mean that the capital markets union could be expected to increase shock smoothing through the market and reduce consumption smoothing through credit. Similarly, they also find that a shock to fiscal stabilisers, like a European unemployment insurance scheme, would be expected to crowd out the credit market channel (in the OECD as a whole, but not in the US).

The main explanation for these results is that since capital markets and fiscal mechanisms work as insurance, hence ex-ante, they are not "exposed" to the crowding-out effect. In contrast, credit markets are a tool for consumption smoothing, and work only ex-post, once the shock has occurred, and if other channels are not working.

This last point is relevant also in view of the interpretation of the empirical findings shown in the previous section, which show that in the euro area risk sharing via capital markets is very small, fiscal insurance is inexistent and credit markets are the main channel for adapting to shocks. Given the limits of the credit channel in terms of its ineffectiveness during downturns and incapacity to cope with permanent shocks, boosting the role of both market and fiscal insurance may be desirable.

All findings, theoretical and empirical, point to the conclusion that market insurance mechanisms should be accompanied by some degree of fiscal insurance. This would boost market risk sharing and reduce the reliance on saving and borrowing to adapt to the shock. The fact that federations like the US and Germany, which exhibit a higher fiscal risk-sharing than other countries/regions, also have a higher degree of market risk-sharing, may not just be a consequence of specific features of financial markets.

Furthermore, it should be considered that shocks of different natures operate in different ways. Financial shocks (e.g. credit bubbles) and output (real economy, sectoral) shocks usually hit upfront different sectors upfront (banking and other industries, respectively) and tend to propagate into the rest of the economy, and possibly across countries, through

different channels, mostly through financial/banking exposure and production and commercial linkages.

Figure 10 attempts to illustrate the idea that when a negative shock occurs, fiscal and market risk-sharing mechanisms intervene upfront (or even in a preventive fashion as they both have an ex-ante nature) depending on the nature of the shock.

If the shock hits a particular industry, one would expect a disequilibrium to emerge in the labour market. Fiscal insurance (e.g. unemployment scheme) is meant to respond directly to it, while market mechanisms are expected to intervene when the shock is transmitted to the banking and the broader financial sector. In principle, the existence of the fiscal insurance should smooth the shock before it is transmitted. In a similar vein, when a financial shock hits, market insurance mechanisms are expected to react upfront to the disequilibria in capital markets, and to smooth/absorb part of the shock before it propagates to the rest of the economy. Thus, ex-ante insurance should prevent banking exposures and capital flows from amplifying the shock. Fiscal risk sharing, in principle, occurs once the shock has reached the real economy and reduces the impact of further feedback effects.

Figure 10 Fiscal and market insurance mechanisms: Substitute or complement?
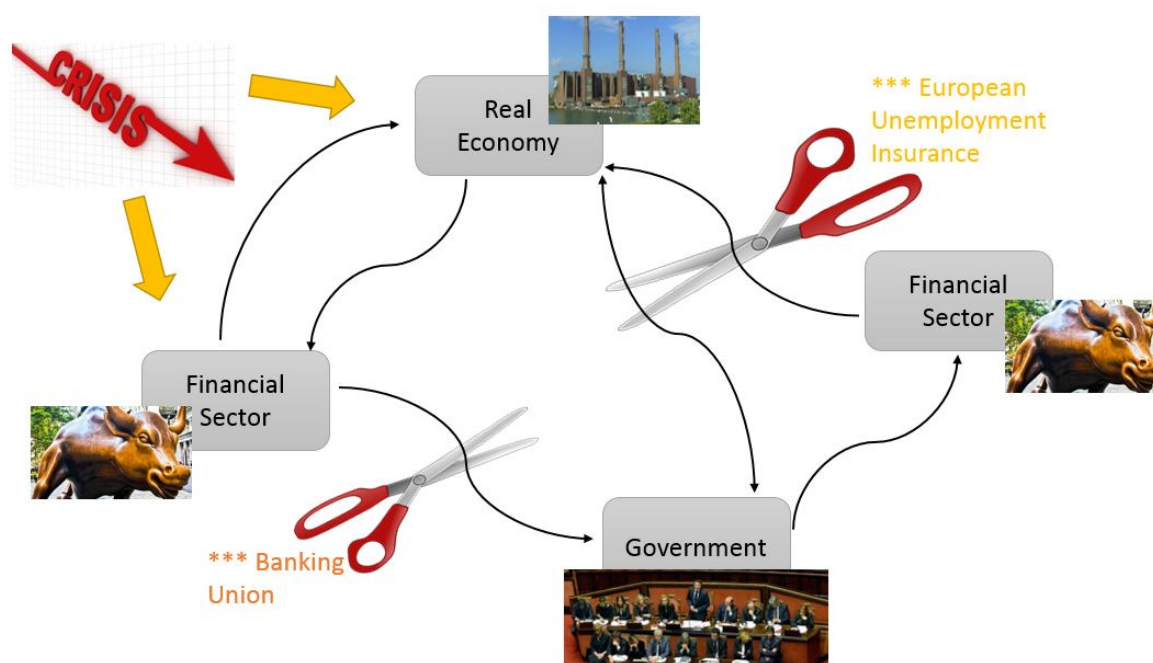
Source: Authors' own elaboration.

In this case, the role of the Banking Union is likely to be limited, but the Capital Markets Union could help to prevent the burden of the losses being concentrated in one country. This is indeed what happened in the case of Nokia, whose shareholders were not concentrated in Finland. Of course, the overall impact depends crucially on whether the shock is temporary or permanent. In the latter case, adjustment in relative prices may be unavoidable, even in the presence of fiscal insurance.

6.   Concluding remarks

In a monetary union, the impact of country-specific shocks can be smoothed through different channels: i) countercyclical national fiscal policy, ii) labour mobility, iii) market mechanisms, namely risk-sharing through access to international capital markets and inter-temporal consumption smoothing through credit markets, as well as iv), when it exists, a central/federal fiscal insurance mechanism.

We acknowledge that for a variety of reasons (including the imperfect design of fiscal rules, high levels of debt, a lack of/excessive market discipline, and even arguments over political economy) fiscal policy tends to be pro-cyclical over time and across countries. Because of this, the hypothesis that national policies alone can deal with asymmetric shock is not realistic. We also acknowledge that while labour mobility is in theory an important channel for adapting to asymmetric shocks, in practice, it has had only a limited effect and this is unlikely to change in the future.

Against this background, the paper has mostly focused on market mechanisms. Indeed their role is likely to change in the medium term but how exactly is not clear.

According to the qualitative arguments presented above, as well the estimates shown in the previous sections, the stabilisation capacity of a region in the face of shocks is difficult to identify and measure, and it can vary over time, as well as according to the state of the economy. In the case of the EU, this observation seems particularly relevant.

Table 3 summarises the main conclusions that emerge from the previous sections.

Table 3. Shock-smoothing capacity, before and after EU reforms

	Normal times	**Crisis times**	**Normal times**	**Crisis times**
	Before EU broad governance reforms	*Before EU broad governance reforms*	*After EU broad governance reforms*	*After EU broad governance reforms*
National fiscal policy	Often pro-cyclical	Often pro-cyclical	Less pro-cyclical	Less pro-cyclical
Labour mobility	Very limited	Larger	Very limited	Larger
Risk-sharing via capital markets	Very low	Very low	Improved, but likely to remain limited	Improved, but likely to remain limited
Consumption smoothing	Key market channel, about 20% – up to 60% for some countries	Lower than in normal times, it can go to zero	Same	Possibly improved (less financial fragmentation)

Source: Authors' own elaboration (based on preceding analysis).

We expect that the adaptability and capacity to respond to shocks will be affected by the governance reforms and in particular by the completion of the BU, with a European deposit

insurance scheme and a backstop for the single resolution fund, as well as advancement in the CMU.

Overall, the new elements are likely to improve the capacity of the system to deal with asymmetric shocks and possibly to reduce their occurrence, but this should remain limited in the medium term and certainly smaller than in the US. The main reason for this is that the current degree of market insurance is so small that any dramatic change seems quite unrealistic in the near future. Moreover, some elements of the economic literature suggest that the capacity of markets to deliver risk sharing is not independent of the existence of fiscal insurance mechanisms. On the one hand, fiscal insurance, defined as an ex-ante mechanism, can affect the behaviour of market participants in catalysing market insurance. On the other hand, it is unlikely to negatively affect the functioning of market insurance, for two main reasons. First, as they are both ex-ante mechanisms, substitution is, by definition, not an issue. Second, market and fiscal insurance should react upfront to disequilibria in different markets and crises in different parts of the economy (real economy versus financial/banking markets).

These considerations all together lead to the conclusion that, from a macroeconomic point of view, in Europe an ex-ante mechanism for fiscal insurance at central level could improve directly and indirectly the adaptability and response to asymmetric shocks and hence income stabilisation.

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