3 Risk sharing in the euro area

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This article discusses the concept of risk sharing, which generally refers to the notion that economic agents, such as households and firms, attempt to insure their consumption streams against fluctuations in the business cycle of their country, i.e. they try to "smooth out" changes in their consumption resulting from economic shocks. The article then considers what proportion of an economic shock in the euro area can be smoothed, and compares this with the situation in the United States. While a comparison of the degree of risk sharing between the euro area and the United States needs to be seen against the background of different institutional and political architectures, it nevertheless offers potentially interesting economic insights. The article shows that, while in the euro area around 80% of a shock to GDP growth in a given country remained unsmoothed over the period 1999-2016, thus resulting in sizeable differences in consumption growth across countries, in the United States at most 40% of a shock to state-specific GDP was unsmoothed over the same period. The article also evaluates the relative importance of the main risk sharing channels, i.e. the credit, capital and fiscal channels, as well as the role of European institutions. It shows that, in the euro area, risk sharing takes place mainly via the capital channel, i.e. through cross-border holdings of financial assets. Finally, the article puts the empirical results into the perspective of the ongoing debate on enhancing the institutional architecture of Economic and Monetary Union (EMU). It calls for euro area countries to make their economies, banking sectors and public finances less vulnerable to macroeconomic shocks. The article explains how efficient and integrated financial markets are a core prerequisite for effective private risk sharing in the euro area. It also shows how the euro area would benefit from a central fiscal stabilisation function to support national economic stabilisers in the presence of large economic shocks and thereby make EMU more resilient.

1 Introduction

The experience with the Great Recession in the euro area has triggered an ongoing policy debate on ways to improve the currency union's resilience to economic shocks. There are two dimensions to this debate: a country-specific one, which deals with domestic reforms to enhance the shock absorption capacity of individual countries, e.g. via structural reforms and the creation of fiscal buffers, and a euro area-wide dimension. Regarding the latter, the resilience of the euro area as a whole could be supported by more effective cross-country risk sharing.

The concept of international risk sharing generally refers to the idea that countries, or economic agents such as households and enterprises, "share risks" to insure themselves against adverse events affecting their economies. For example, they can invest in and receive income from other economies that are not affected by such events. The economic literature suggests that unexpected changes in income and consumption (often referred to as "shocks") are detrimental to the welfare of an

economy. Households, firms and the public sector may therefore benefit from insuring themselves against such shocks via "private" and "public" mechanisms which operate at the inter-jurisdictional level, i.e. between states or regions in a federation (such as the United States or Germany) or the international level, i.e. across different countries (for example in the euro area). Private mechanisms work through two main channels. The first, the "savings channel" (also referred to as the "credit channel"), operates via cross-border saving/borrowing, i.e. the public sector, households and firms may borrow internationally (or inter-jurisdictionally) to sustain consumption or investment levels in the face of adverse shocks. Indeed, the supply of credit to an economy is in principle less affected by country-specific shocks when international banks operate in that economy. The second is a "capital market channel", which runs via internationally/inter-jurisdictionally diversified private investment portfolios. These can generate income flows unrelated to fluctuations in the home economy, as long as the home and the other economies are not strongly interlinked and therefore experience similar business cycles. A third "public" channel relies on cross-regional fiscal transfers. This channel is generally well-developed in mature federations, where transfers from the federal government help to smooth the impact of shocks at the state or regional level.

Empirical evidence suggests that the degree of cross-country risk sharing in the euro area falls short of what is observed for regions in federations, notably among US states. Three main results emerge from the empirical literature. First, around 60-80% of state-specific shocks is smoothed via the above risk sharing channels in the United States while the corresponding number for euro area countries has generally been no more than 20% since the start of the EMU.[75] Second, risk sharing in the United States takes place mainly via private channels, with the capital market channel explaining the largest share of the overall cross-state smoothing of shocks. Third, fiscal transfers from the federal budget contribute significantly to the absorption of state-specific shocks in the United States (10-15%), while the euro area institutional architecture lacks a central macroeconomic stabilisation function, so that smoothing via this channel in the euro area is negligible.

Enhancing the euro area's shock absorption capacity is one of the main themes of the "Five Presidents' Report". Published in June 2015, the report, by the President of the European Commission in close cooperation with the Presidents of the Euro Summit, the Eurogroup, the ECB and the European Parliament, was aimed at providing a roadmap for deepening the institutional architecture of EMU across various policy domains.[76] It emphasises that "For all economies to be permanently better off inside the euro area, they also need to be able to share the impact of shocks through risk-sharing within the EMU". However, this would require "significant

[75] See, e.g., "Quarterly Report on the Euro Area Volume 15, No 1 (2016)", *Institutional Papers*, No 024 , European Commission, 2016, and Alcidi, C., D'Imperio, P. and Thirion, G., "Risk-sharing and Consumption-smoothing Patterns in the US and the Euro Area: A comprehensive comparison", *CEPS Working Document*, No 2017/04, May 2017. Results for the euro area may show a larger degree of shock absorption when only private consumption is considered, as in Cimadomo, J., Furtuna, O. and Giuliodori, M., "Private and public risk sharing in the euro area", *Working Paper Series*, ECB, forthcoming.

[76] See Juncker, J.-C., Tusk, D., Dijsselbloem, J., Draghi, M. and Schulz, M., "Completing Europe's Economic and Monetary Union", European Commission, June 2015.

and sustained convergence towards similarly resilient economies" to avoid permanent transfers and weakened incentives for sound policymaking in the individual countries.

This article provides new estimates of the relative contributions of the saving, capital and fiscal channels to consumption risk sharing in both the euro area and the United States. The empirical analysis is based on a sample which runs from 1999 until 2016. For the euro area, it discusses the role of European institutions and official assistance for risk sharing, and links to the ongoing debate on deepening EMU. The article builds on previous ECB work on indicators of risk sharing in the euro area, included regularly since 2016 in the annual "Financial Integration in Europe" report.

2 The concept of risk sharing

2.1 Consumption and output synchronisation in the euro area versus the United States

The economic literature describes the notion of risk sharing as the idea that agents insure their consumption streams against country-specific business cycle fluctuations.[77] It also says that insuring consumption streams results in an improvement in welfare.[78] Consumption can be smoothed via inter-temporal channels, e.g. through private savings, welfare programmes and intergenerational transfers (i.e. public debt). For example, governments may increase transfers to households during bad economic times, and finance these transfers with public debt, which will need to be repaid by future generations. However, consumption streams can also be insured via risk sharing through international channels, e.g. cross-country transfers which help to cushion country-specific shocks. The recent debate in the euro area has developed around the international dimension of risk sharing, for example in the context of the discussion about the deepening of banking and capital markets union and the introduction of a fiscal capacity for the euro area. This article also focuses on international risk sharing.[79]

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77 While the literature refers to both consumption and income risk sharing, in this article we focus mainly on the former.

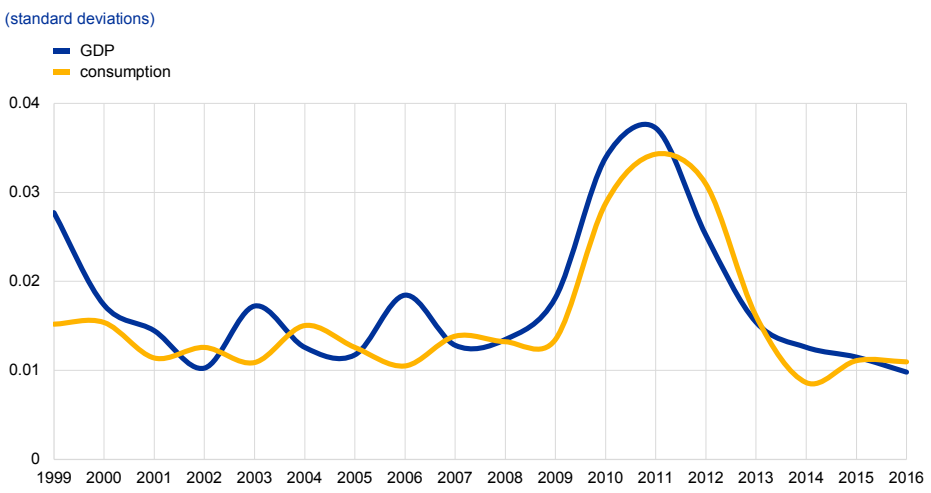
78 See, e.g., Canova F. and Ravn, M., "International consumption risk-sharing", *International Economic Review*, Vol. 37, No 3, 1996, pp. 573-601.

79 An important aspect of this discussion relates to the role of financial markets: if markets are "complete", economic agents can insure themselves against any type of risk that may materialise. For example, firms can buy insurance contracts which protect them against unexpected adverse shocks, e.g. a decline in the demand for their products. In this hypothetical environment consumption growth in a country is not affected by idiosyncratic shocks but only by global, i.e., uninsurable, shocks. If, more realistically, markets are incomplete, however, i.e. economic agents do not have a complete menu of insurance contracts for all possible risks, consumption insurance may have to be reinforced by means of institutions, e.g. transfer or lending schemes that operate between countries as insurance mechanisms. Farhi, E. and Werning, I., "Fiscal Unions", *American Economic Review*, Vol. 107, No 12, 2017, pp. 3788-3834, highlights that – even in presence of complete markets – there might be benefits from public risk sharing because agents do not make full use of the positive stabilising effects provided via public institutions.

Tests of international risk sharing have been typically based on the relationship between total economy consumption growth and output growth, controlling for global economic shocks and other factors. To the extent that consumption growth is uncorrelated with output growth, this would point to effective risk sharing. Empirically, the correlation between consumption and output growth in euro area countries is indeed generally far from zero, e.g. over the period 1999-2016 it is around 0.40 for Portugal and around -0.30 for Finland. Under perfect risk sharing, consumption would be completely delinked from output fluctuations, i.e. the correlation coefficient would be zero for all countries. It is interesting to note that, in the euro area, the cross-country dispersions of output and consumption growth have been very similar in the EMU period (Chart 1), whereas in the United States cross-state dispersion of output growth has been significantly larger than cross-state dispersion of consumption growth (Chart 2), thus signalling the presence of smoothing effects via federal transfers or via credit and capital channels. This initial evidence seems to suggest that risk sharing operates more powerfully in the United States than in the euro area.

Chart 1

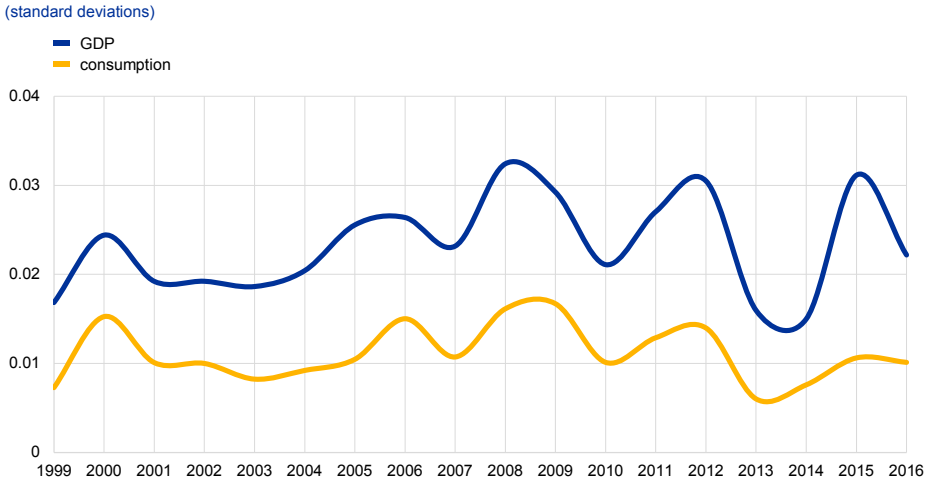
Output and private consumption dispersion in the euro area



Sources: European Commission (AMECO database) and ECB calculations.
Notes: Cross-country dispersion, measured in standard deviations, of real per-capita consumption and GDP in a sample of 11 euro area countries.

Chart 2

Output and private consumption dispersion in the United States



Sources: Federal Reserve Bank of St. Louis (FRED database), US Bureau of Economic Analysis and ECB calculations.
Notes: Cross-country dispersion, measured in standard deviations, of real per-capita consumption and GDP in the sample of 50 US states.

2.2 The literature on international risk sharing

The empirical risk sharing literature has been based on more sophisticated tests than those presented above but still has focused on the relationship between consumption and output. In particular, it has examined the extent of risk sharing both in monetary unions with a common fiscal policy (the United States, Germany) and in monetary unions without a common fiscal policy (the euro area). The former case generally exhibits a high degree of overall risk sharing, with a large contribution from private sector markets.[80]

2.2.1 Monetary unions with common fiscal policy

In their seminal paper on the United States, Asdrubali, Sorensen and Yosha suggested that, for the period 1963-90, 75% of shocks to the per capita gross product of individual states was smoothed.[81] This implies that only about a quarter of state-specific income shocks remained unsmoothed. 13% of income shocks was smoothed by the federal tax-transfer and grant system. In this regard, it should be noted that in several US states a balanced budget rule is in place, thus implying a limited role for counter-cyclical fiscal policies at the state level. As regards other channels, 39% was smoothed by insurance or cross-ownership of assets, and 23% by borrowing or lending. In other words, 62% of state-specific shocks in the United States is smoothed through market transactions, almost five times the contribution of

[80] For an earlier survey of the macro risk sharing literature, see Special Feature A of "Financial Integration in Europe", ECB, 2016.

[81] Asdrubali, P., Sorensen, B., and Yosha, O., "Channels of Interstate Risk Sharing: United States 1963-1990", *Quarterly Journal of Economics*, Vol. 111, No 4, 1996, pp. 1081-1110.

the federal government to income smoothing. Moreover, some papers have shown that risk sharing in the United States has been increasing over time, which could be in part due to banking deregulation.[82] Studies focusing on other monetary unions, characterised by a large federal government, such as Canada, find results similar to those for the United States in terms of channels for consumption smoothing and overall size of smoothed versus unsmoothed shocks.[83]

Works on European countries are rarer, and generally point to stronger risk sharing for countries whose regions are more fiscally and financially integrated. Some authors have analysed the German case. For example, Hepp and von Hagen [84] find a very high level of risk sharing across the German regions. In particular, this analysis shows that in pre-unification Germany, 91% of shocks to per capita state gross product was smoothed (i.e. only 9% was left unsmoothed), with the bulk (54%) smoothed through the federal tax-transfer and grant system, 20% smoothed through capital markets and 17% through credit markets. After unification, the unsmoothed component of risk sharing rose to 20%. At the same time, the contribution of risk sharing through private channels increased to 69%, with the bulk (51%) smoothed through capital markets. This points to a large potential for risk sharing achieved via the cross-border ownership of productive assets in the context of regions with a sufficiently heterogeneous degree of economic development.

2.2.2 Risk sharing across euro area countries

It is natural to conjecture that there will be lower levels of risk sharing across countries in Europe than in existing mature federations. This was clearly the case in the years leading to the introduction of the euro, with comparatively underdeveloped financial markets, rigid labour markets, low mobility of labour and the absence of a federal system of taxes and transfers similar to that of, for example, the United States. Earlier works indicate that at most 40% of country-specific GDP shocks was smoothed in the pre-EMU period.[85] At the start of the EMU, it was generally believed that the creation of the single currency would in itself enhance income and consumption smoothing. A common currency is in principle likely to reduce the costs of trading and information gathering, and therefore should lead to higher cross-country ownership of financial assets. The removal of currency risk might further stimulate foreign direct investment, and a greater integration of bond markets would imply deeper and more liquid markets for borrowing and lending. It was understood

82 Athanasoulis, S. and van Wincoop, E., "Risk sharing within the United States: What do financial markets and fiscal federalism accomplish?", *Review of Economics and Statistics*, Vol. 83(4), pp. 688-698; Demyanyk, Y., Ostergaard, C. and Sorensen, B., "U.S. Banking Deregulation, Small Businesses, and Interstate Insurance of Personal Income", *Journal of Finance*, Vol. 62, No 6, 2007, pp. 2763-2801.

83 See, for example, Crucini, M.J., "On International and National Dimensions of Risk Sharing", *Review of Economics and Statistics*, Vol. 81, No 1, 1999, pp. 73-84.

84 Hepp, R. and von Hagen, J., "Interstate risk sharing in Germany: 1970-2006", *Oxford Economic Papers*, Vol. 65, No 1, 2013, pp. 1-24.

85 Sorensen, B. and Yosha, O., "International risk sharing and European monetary unification", *Journal of International Economics*, Vol. 45, No 2, 1998, pp. 211-238; Afonso, A. and Furceri, D., "EMU enlargement, stabilization costs and insurance mechanisms", *Journal of International Money and Finance,* Vol. 27, No 2, 2008, pp. 169-187.

that larger holdings of foreign equities can lead to greater international risk sharing,[86] as can the integration of banking markets.[87] It was also believed that the euro would improve risk sharing by nurturing capital market integration among EU Member States.[88]

Empirical results from the literature on the pre-EMU and EMU periods are mixed.[89] Early evidence on the pre-EMU risk sharing patterns among European countries was provided by Sorensen and Yosha. They found that only 40% of GDP shocks was smoothed, with half of the smoothing achieved by government savings and the other half by private savings. Following the introduction of the euro, some studies have indicated that risk sharing among EU member states initially reached higher levels than during the pre-euro period,[90] even though the amount of smoothed shocks remained lower in Europe than in other regions. However, some studies have suggested that risk sharing actually declined after the introduction of the euro. For example, Afonso and Furceri, analysing a panel of 25 European countries, find that only 43% of shocks to GDP was smoothed before the start of EMU, almost entirely by private and public savings. They also show that this share decreased to 37% after the introduction of the euro, suggesting that euro area members have not benefited from additional risk sharing. Moreover, Furceri and Zdzienicka,[91] using an unbalanced panel of 15 euro area countries, show that the amount of unsmoothed shocks in periods of recession is significantly larger than in normal times, and this is particularly true for severe downturns that are persistent and unanticipated. This result is largely driven by the lack of consumption smoothing provided by private savings via the credit channel. In general, the existing literature shows that levels of risk sharing have remained substantially lower in the euro area since the introduction of the euro than within regions of a federation such as the United States. Finally, some papers have suggested that risk sharing may have weakened in countries under fiscal stress and undergoing adjustment programmes, because government savings increased at a time in which GDP collapsed.[92] At the same time, Cimadomo et al.[93] have recently shown, on the basis of a restricted sample of 11 euro area countries and focusing only on private consumption, that the activation of financial assistance through the European Financial Stability Facility (EFSF)/European Stability Mechanism (ESM) has enhanced risk sharing in the euro area (see Box 2).

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86 Sorensen, B., Wu, Y.-T., Yosha, O. and Zhu, Y., "Home bias and international risk sharing: Twin puzzles separated at birth", *Journal of International Money and Finance*, Vol. 26, No 4, 2007, pp. 587-605.

87 Demyanyk, Y., Ostergaard, C. and Sorensen, B., op. cit.

88 Sorensen, B. and Yosha, O., "International risk sharing and European monetary unification", op. cit.

89 For a survey of the literature on risk sharing in EMU, see Ioannou, D. and Schäfer, D., "Risk sharing in EMU: key insights from a literature review", *SUERF Policy Note*, Issue No 21, SUERF, November 2017.

90 Kalemli-Ozcan, S., Sorensen, B. and Yosha, O., "Asymmetric shocks and risk sharing in a monetary union: updated evidence and policy implications for Europe", in Huizinga, H. and Jonung, L. (eds.), *The Internationalization of Asset Ownership in Europe*, Cambridge University Press: New York, 2005.

91 Furceri, D. and Zdzienicka, A., "The Euro Area Crisis: Need for a Supranational Fiscal Risk Sharing Mechanism?", *Open Economies Review*, Vol. 26, No 4, September 2015, pp. 683-710.

92 Kalemli-Ozcan, S., Luttini, E. and Sorensen, B., "Debt crises and risk sharing: the role of markets versus sovereigns", *NBER Working Paper*, No 19914, National Bureau of Economic Research, February 2014.

93 Cimadomo, J., Furtuna, O. and Giuliodori, M., "Private and public risk sharing in the euro area", *Working Paper Series*, ECB, forthcoming.

Box 1
Estimating the contribution of financial and fiscal tools to risk sharing: the methodology

Prepared by Alexander Popov

Asdrubali, Sorensen and Yosha, and Asdrubali and Kim, propose a methodology for quantifying the contribution of cross-border financial and fiscal transactions to risk sharing.[94] In their set-up, risk sharing is defined as a decoupling of aggregate consumption growth from aggregate output growth. The methodology is based on a decomposition of the growth in per-capita gross domestic product in country i at time t, GDPit, as follows:[95]

GDPit = (GDPit – GNPit) + (GNPit – GDIit) + (GDIit – Cit) + Cit

The first component, GDPit – GNPit, designated the "capital channel", captures the difference between per-capita gross national product and per-capita gross domestic product. This includes, for example, income on financial assets held abroad and labour income from employment abroad. The second channel, GNPit – GDIit, designated the "fiscal channel", captures the difference between per-capita gross national product and per-capita gross disposable income. This includes mainly cross-border transfers between governments (e.g. EU structural funds) or, in the United States, federal transfers. It also includes transfers between individuals (i.e. remittances), although these are typically smaller in size (therefore, in the literature, the channel is generally labelled as "fiscal"). The third channel, GDIit – Cit, designated the "credit channel", captures the difference between per-capita gross disposable income and per-capita consumption. This includes, for example, borrowing abroad by individuals and governments, either in credit markets or through supranational insurance mechanisms such as the ESM.[96] The first two channels capture ex-ante risk sharing, as they refer to financial arrangements made before per-capita GDP growth is realised. The last channel captures ex-post risk sharing, as it refers to financial arrangements made after the shock to per-capita GDP has taken place.

Since 2016 an indicator based on this decomposition has been included on a regular basis in the ECB's "Financial Integration in Europe" report. The analysis presented there includes a fourth channel, designated the "price channel" and constructed as the difference between the CPI and the GDP deflator. The idea underlying this channel is that even in the absence of risk sharing through capital, fiscal or credit channels, economic agents may share risks via valuation effects of output in terms of consumption.

94 Asdrubali, P., Sorensen, B. and Yosha, O., op. cit.; Asdrubali, P. and Kim, S., "Dynamic risk sharing in the United States and Europe", *Journal of Monetary Economics*, Vol. 51, No 4, 2004, pp. 809-836.

95 As in Asdrubali, P., Sorensen, B. and Yosha, O., op. cit., all variables are expressed in log differences.

96 The credit channel is not affected by inter-temporal smoothing, given that the latter would operate via borrowing or lending between sectors in the economy (e.g. between the private sector and the government), while in the proposed decomposition gross domestic income (*GDI*) and consumption (*C*) refer to the whole economy.

3 Estimating risk sharing in the euro area and in the United States

Patterns of risk sharing among, on the one hand, individual countries of the euro area and, on the other hand, individual states in the United States are remarkably different. Charts 3 and 4 show estimates of the capital channel, fiscal channel and credit channel for the euro area and the United States, on the basis of the methodology described in Box 1, for the period from 1997 until 2016.[97] Estimates are performed on windows of ten years, e.g. the bar for 2007 describes the average ten-year cumulative contribution of the capital channel, fiscal channel and credit channel during the period 1998-2007. For comparability with other works, the empirical analysis is based on the first 12 countries to adopt the euro.[98]

The first difference concerns the overall amount of shocks absorbed via risk sharing channels in these two regions. While in the euro area around 80% of a shock to country-specific GDP growth routinely remains unsmoothed, in the United States at most 40% of a shock to state-specific GDP is unsmoothed. Second, while in the United States the credit channel accounts for about 20% of risk sharing over the sample period, in the euro area its contribution is negative, although small.[99] A negative contribution to risk sharing via the credit channel in the euro area implies borrowing abroad in economic good times and repayment of the loans in economic bad times, adding volatility to consumption in a pro-cyclical way.[100] These findings suggest that a complete banking union is a fundamental prerequisite for the credit channel to contribute positively to risk sharing, as the case of the United States emphasises. Third, the fiscal channel in the euro area helps smooth at most 5% of a country-specific shock, compared with close to 10% in the United States. Finally, the capital channel in the United States helps smooth between 30% and 35% of a state-specific shock, accounting for more than half of overall risk sharing. In the euro area, too, this channel explains the bulk of the observed cross-border risk sharing. However, with the exception of the period 1998-2009, its contribution is smaller than in the United States, amounting on average to around 20%.

97 The definition of some variables in the euro area and US datasets is in some cases slightly different. Alcidi, D'Imperio and Thirion, op. cit., adjusts the euro area dataset to make it fully comparable with the US dataset and shows that differences in results from the adjusted and unadjusted datasets are negligible.

98 Ireland is excluded from the analysis owing to unusually large revisions in some of the country's main macroeconomic statistics for 2015 that were made in July 2016. These revisions affected real GDP, some of its components and balance of payments figures; some of them would feed into the indicator in this chart although they would not indicate a change in risk sharing. See the box entitled "Tackling Measurement Challenges of Irish Economic Activity", *World Economic Outlook*, International Monetary Fund, April 2017, pp. 43-45, which also presents the timetable for resolving the measurement problems in the future.

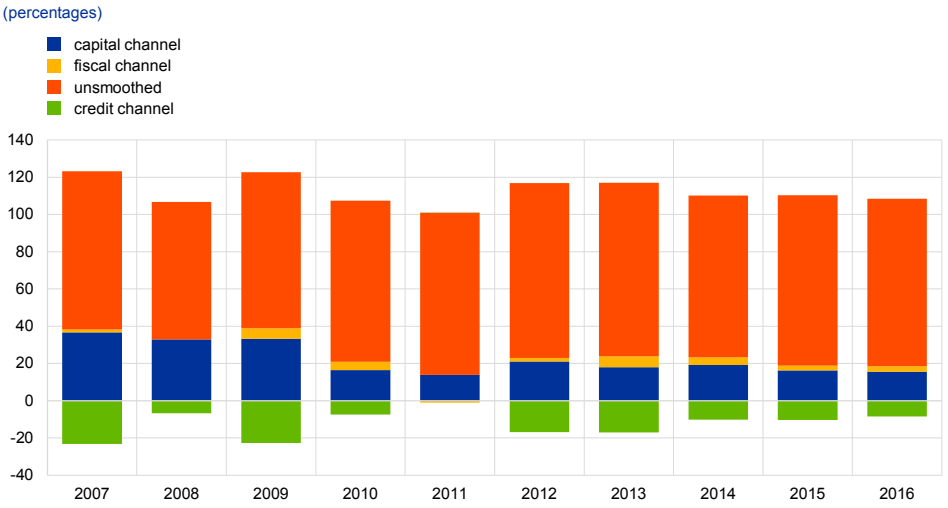
99 Other papers focusing on the euro area – and on a comparison of the pre-crisis and post-crisis periods – also find that the degree of risk sharing was not very severely hampered in the second sub-sample (see, e.g., Milano, V., "Risk sharing in the euro zone: the role of European institutions", *CeLEG Working Paper*, No 01/17, LUISS University, March 2017).

100 On the pro-cyclicality of cross-border lending, see also Albertazzi, U. and Bottero, M., "Foreign Bank Lending: Evidence from the Global Financial Crisis", *Journal of International Economics*, Vol. 92, Supplement 1, 2014, pp. S22-S35.

In conclusion, the evidence for the United States is fairly consistent with earlier studies, finding a large contribution from private financial channels to risk sharing.[101] Overall, between 60% and 80% of a shock to state-specific output growth is smoothed through private and public channels, with financial markets smoothing more than 50%, and with fiscal transactions accounting for the rest. In the euro area, around 80% of a country-specific shock remains unsmoothed, with capital markets helping to smooth between 20% and 40% of a shock, the fiscal channel's contribution negligible and credit markets typically reducing the smoothing of GDP shocks. At the same time, as highlighted in Box 2, European institutions seem to have contributed positively to risk sharing in recent years.

Chart 3

Consumption risk sharing in the euro area and its channels

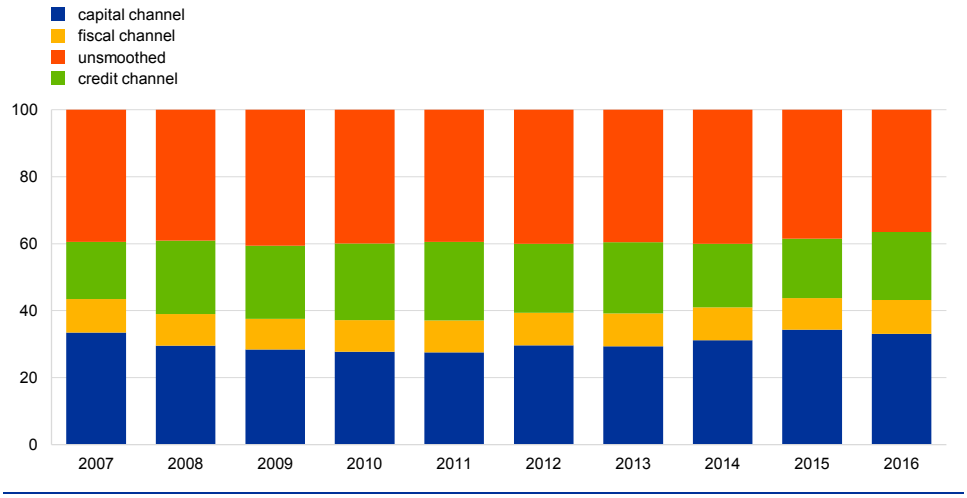


Source: ECB calculations.
Notes: The contributions of the channels are calculated using a vector-autoregression (VAR) model whose parameters are estimated over a ten-year rolling window of annual data. Bars display the proportion of a one-standard-deviation shock to domestic GDP growth that is absorbed by each risk sharing channel. The shares are computed on the basis of the cumulative impact of the shock on the variables capturing each risk sharing channel over a ten-year horizon. Year-to-year variation in the shares reflects changes in the re-estimated model parameters. The remaining portion represents the share of the shock to country-specific real GDP growth that remains unsmoothed and is fully reflected in country-specific consumption growth. The individual bars can go below 0% and above 100% if one or more of the channels involved has a dis-smoothing effect on country-specific consumption growth. The shares in each bar total 100%.

[101] See, for instance, Asdrubali, P., Sorensen, B. and Yosha, O., op. cit.

Chart 4

Consumption risk sharing in the Unites States and its channels



Source: ECB calculations.
Notes: See Chart 3.

Box 2

The role of European institutions and official assistance in risk sharing

Prepared by Jacopo Cimadomo

This box illustrates the role of EU institutions and EFSF/ESM[102] assistance in improving risk sharing in the euro area. While the literature generally focuses on private risk sharing channels (via capita and credit markets), recent papers have shown that risk sharing can be supported by public channels at the EMU level. Indeed, a significant amount of loans have been directed from European institutions, such as the European Commission, the EFSF and the ESM, to more vulnerable countries. Transfers from the European Union generally take the form of EU structural funds, although these funds are not designed for stabilisation purposes but rather to support economic convergence. Loans from the EFSF/ESM have been directed to euro area countries in the context of official programmes, with a view to recapitalising banks and supporting the financing needs of countries which had lost access to credit markets. EFSF/ESM loans can be thought of as an ex-post risk sharing device, ensuring, at least indirectly, a certain degree of shock smoothing in euro area countries. For example, official assistance through EFSF/ESM loans may have helped the governments of the receiving countries to maintain a certain level of public expenditure. It may have helped to finance public salaries and pensions, which otherwise would have been cut even more severely (e.g. in case of a sovereign default). This may have contributed to sustaining private (and public) consumption.

Two recent papers have looked at this channel: Milano[103] and Cimadomo et al.[104] Both papers focus on the role played by European institutions in enhancing risk sharing in the euro area, especially during the recent crisis. Based on different methodologies, they both find that institutions have a

[102] See the article entitled "The European Stability Mechanism", *Monthly Bulletin*, ECB, July 2011.
[103] Milano, V., op. cit.
[104] Cimadomo, J., Furtuna, O. and Giuliodori, M., op. cit.

positive effect on consumption risk sharing in the euro area. In particular, Cimadomo et al., using a sample of 11 euro area countries over the period 2000-15, show that the degree of absorption of country-specific shocks increased by about 17 percentage points from the activation of the EFSF in 2010, followed by the ESM in 2012.[105] Milano, using a similar sample of euro area countries, finds even stronger effects.

It should be noted that official loans via the EFSF/ESM are accounted for under the credit channel. While, in the empirical analysis shown in Chart 3, this channel contributes negatively to risk sharing in the euro area, it covers both cross-border lending via private-sector entities and official lending via supranational institutions. Milano shows that the former contributes negatively to the credit channel while supranational institutions contribute positively.

4 Conclusions

A consensus has emerged from the experience with the Great Recession that the euro area's institutional architecture is in need of reform to enhance its capacity to deal with large economic shocks. In this context, the publication of the Five Presidents' Report on Completing Europe's Economic and Monetary Union triggered an ongoing debate in the policy domain as well as in academia on ways to improve EMU's economic resilience. This debate has been influenced by findings of the empirical literature that identify and quantify risk sharing channels within federations and the euro area. This literature typically finds a more limited degree of risk sharing in the euro area than in the United States. It also finds that higher shock absorption in the United States results mainly from more effective private risk sharing via credit and capital markets. Fiscal risk sharing also plays a more prominent role in the United States, given the latter's different institutional and political architecture and in particular its sizeable federal budget.

In this context, important institutional steps towards a genuine Economic and Monetary Union in Europe have already been taken in recent years. First, the European Stability Mechanism was created in 2012 to provide conditional financial assistance to solvent euro area countries experiencing financing problems. Second, the European banking union was launched in 2014, building on the Single Supervisory Mechanism and the Single Resolution Mechanism. It ensures a consistent application of EU banking rules, thereby reducing risks in the banking sector related to, for example, exposure of national banking systems to their sovereigns.

Looking ahead, further reform is needed, along mainly three dimensions: first, euro area countries need to enhance their internal capacity to deal with macroeconomic shocks, in particular by effectively reducing vulnerabilities in their economies, banking sectors and public finances. Economic resilience needs to be improved via

[105] This indicates that, following a 1% shock to country-specific GDP, 0.17 percentage point of it is smoothed through official assistance via EFSF/ESM loans on average in the considered sample of 11 euro area countries.

structural reforms that support potential growth and increase market flexibility. In this context the Five Presidents' Report calls for a "significant and sustained convergence towards similarly resilient economies" in the euro area, so that risk sharing is based on the insurance principle and not on permanent transfers. At the same time, euro area countries should use the current favourable economic environment to build fiscal buffers and reduce debt ratios in line with the requirements of the Stability and Growth Pact framework. This will be important to weather future economic shocks.

Second, efficient and integrated financial markets are a core prerequisite for efficient private risk sharing in the euro area. In this context, a true capital markets union could significantly help to diversify and reduce risk. An action plan was adopted by the European Commission in 2015 setting out a list of key measures to ensure more diversified sources of finance for companies and achieve a true single market for capital in Europe. In its mid-term review of the plan in June 2017 the Commission pointed to progress regarding, among other things, the development of venture capital markets and the market for securitisation, as well as better access for companies to public markets. At the same time, new priorities were communicated, for example to strengthen the effectiveness of supervision in order to accelerate market integration, to harness the potential of financial technology, or fintech, and to better use capital markets to strengthen bank lending and stability.

Completing banking union will reduce risks for taxpayers and break the remaining link between banks and national governments. A European deposit insurance scheme is essential for a truly integrated banking system and a single currency. A common backstop for the Single Resolution Fund – which could be provided by the ESM as proposed for example in the European Commission's December 2017 Communication[106] on deepening EMU – would further strengthen banking union. A European deposit insurance scheme coupled with a credible common backstop will underpin depositor confidence in the banking union as a whole, notably by offering protection even in the case of large shocks to (a part of) a given country's banking sector.[107] Breaking the bank-sovereign nexus will also require measures to reduce the home bias in the sovereign holdings of banks. Several proposals have been put forward in this context, ranging from regulatory penalties for concentrated sovereign exposures to a more general reform of the regulatory treatment of sovereign exposures.[108] The report of the European Systemic Risk Board's High-Level Task Force on Safe Assets suggests that the creation of a euro area-wide low-risk asset could help to weaken the bank-sovereign nexus.[109] All these proposals need to be carefully evaluated, among other things in terms of their impact on financial stability in the euro area.

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106 See "Further steps towards completing Europe's Economic and Monetary Union: a roadmap", communication from the European Commission to the European Parliament, the European Council, the Council and the European Central Bank, 6 December 2017.

107 See "Financial Integration in Europe", ECB, 2016.

108 See "ESRB report on the regulatory treatment of sovereign exposures", European Systemic Risk Board, March 2015.

109 See Volume 1 of ESRB High-Level Task Force on Safe Assets, "Sovereign bond-backed securities: a feasibility study", European Systemic Risk Board, January 2018.

Third, the euro area would benefit from a central fiscal stabilisation function which can support national economic stabilisers in the presence of large economic shocks and thereby make EMU more resilient. There are many ways a euro area fiscal capacity could be implemented, for example an unemployment benefit scheme or a euro area budget for investment. Each of these options has its own technical and political challenges and benefits. It will be essential, though, to maximise positive effects on the functioning of EMU while at the same time preserving incentives for sound fiscal policymaking and addressing structural weaknesses at the national level. The aim should not be to actively fine-tune national economic cycles or to equalise revenues. This is in line with the design principles described in the Five Presidents' Report, which says that a fiscal capacity should not entail permanent transfers in one direction.

Finally, progress towards fiscal union and stronger financial union in the euro area is likely to be mutually reinforcing. More efficient capital markets, for example, would reduce the need for stabilisation via other channels, such as fiscal and monetary policy. At the same time, fiscal union and stronger common EU institutions may strengthen cross-border financial activities.