

IMF STAFF DISCUSSION NOTE

A Central Fiscal Stabilization Capacity for the Euro Area

Nathaniel Arnold, Bergljot Barkbu, Elif Ture,
Hou Wang, and Jiaxiong Yao

DISCLAIMER: Staff Discussion Notes (SDNs) showcase policy-related analysis and research being developed by IMF staff members and are published to elicit comments and to encourage debate. The views expressed in Staff Discussion Notes are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

A Central Fiscal Stabilization Capacity for the Euro Area

Prepared by Nathaniel Arnold, Bergljot Barkbu, Elif Ture, Hou Wang, and Jiaxiong Yao¹

Authorized for distribution by Poul M. Thomsen and Vitor Gaspar

DISCLAIMER: Staff Discussion Notes (SDNs) showcase policy-related analysis and research being developed by IMF staff members and are published to elicit comments and to encourage debate. The views expressed in Staff Discussion Notes are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

JEL Classification Numbers: E62, F45, H87

Keywords: Euro Area, Fiscal Integration, Macroeconomic Stabilization

Authors' E-mail Address: narnold@imf.org; bbarkbu@imf.org; hture@imf.org;
hwang2@imf.org; jyao@imf.org

¹ This paper was produced under the guidance of Adrienne Cheasty, Mahmood Pradhan, Cathy Pattillo and Shekhar Aiyar. Douglas Laxton and Susanna Mursula kindly helped with the EUROMOD simulations. Jesse Siminitz, Younghun Kim, and Samuel Romero Martinez provided excellent research assistance.

CONTENTS

EXECUTIVE SUMMARY	4
INTRODUCTION	5
ECONOMIC RATIONALE FOR A CENTRAL FISCAL STABILIZATION CAPACITY	7
GUIDING PRINCIPLES	9
CFC PROPOSAL	10
HOW WOULD THE PROPOSED CFC PERFORM?	18
CONCLUSIONS	25
BOX	
1. Recent Proposals for a Euro Area CFC	6
FIGURES	
1. Output Gap versus Unemployment Rate Deviation	14
2. Shock Scenarios—Output and Inflation Impact	20
3. CFC Assets	21
4. Shock Scenarios for Select Countries	21
5. Country-Specific Shock Scenarios	22
6. Calibrating Contribution and Transfer Rates	23
7. Usage Premium and Cap on Cumulative Net Contributions	25
REFERENCES	27

EXECUTIVE SUMMARY

Renewed political momentum for reforms of the euro area architecture opens the door for discussions of a central fiscal capacity (CFC). In the coming months, political leaders could take concrete steps toward completing the Banking Union and further developing the European Stability Mechanism. While leaders and European Union (EU) institutions have recently presented ideas for a euro area CFC, concerns remain regarding the risks of moral hazard and permanent transfers associated with fiscal risk sharing.

A CFC to smooth the macroeconomic cycle would fill an important gap in the euro area architecture. The currency union would benefit from a CFC to help countries smooth country-specific shocks (which monetary policy cannot do) and facilitate an appropriate mix of fiscal and monetary support in the face of common shocks, especially when monetary policy is constrained at the effective lower bound and fiscal space is limited in some countries.

This Staff Discussion Note (SDN) proposes a macroeconomic stabilization fund. The fund would be financed by regular annual contributions to build assets in good times and make transfers to support countries in bad times. It would also have a borrowing capacity for use in the event of exceptionally large or persistent common shocks that would exhaust its assets.

To achieve economic effectiveness and political feasibility, with an explicit link between stabilization and risk reduction, the CFC would have to respect the following guiding principles:

- **To ensure fiscal discipline and avoid moral hazard problems, the CFC would require strict adherence to the fiscal rules.** Ideally, the fiscal rules would be overhauled in conjunction with the creation of the CFC, to simplify the rules and make their enforcement more automatic.
- **To ensure that CFC support is nondiscretionary, transfers from the CFC to countries would be triggered automatically by a transparent cyclical indicator.**
- **The CFC would be politically acceptable only if it does not generate permanent transfers.** Several options to prevent permanent transfers are examined in this SDN, such as requiring a country that receives transfers from the CFC in bad times to pay a “usage premium” on the cumulative transfers once its economy has recovered, as well as capping cumulative net transfers to a country.

Our analysis shows that moderate annual contributions could finance a meaningful stabilization capacity. For example, with annual contributions of 0.35 percent of GDP, the buildup of assets in typical good times would have been sufficient to finance a large part of the operation of automatic stabilizers in past euro area recessions. But accumulated assets would likely fall short of the transfers that would be prescribed if a tail-risk shock materializes; hence, the need for a borrowing capacity.

INTRODUCTION

1. The broad-based recovery, combined with renewed political momentum, provides a rare window of opportunity for advancing the euro area architecture. The euro area is enjoying a period of robust growth. Polls show that support for the euro in member countries is at the highest level in more than a decade. External developments have demonstrated the benefits of the European Union (EU), and political leaders are making further European integration a key part of their policy agenda. Such windows of opportunity can be short; leaders should push ahead with reforms while they last.

2. The IMF has long supported reforms to strengthen the euro area architecture.¹ The euro area crisis exposed shortcomings in the functioning of the currency union, and IMF staff have argued that further integration would make the euro area more resilient to shocks. While important policy actions—such as setting up the Banking Union and the European Stability Mechanism (ESM)—have considerably strengthened the currency union, gaps remain. A common deposit insurance scheme and a common fiscal backstop to the Single Resolution Fund are still needed to weaken the bank-sovereign nexus and complete the Banking Union. A deeper Capital Markets Union (CMU) would strengthen private cross-border risk sharing. Progress is underway in these areas. However, the euro area architecture should be completed in full. Greater fiscal risk sharing—in conjunction with a reform of the fiscal rules—is still needed to allow fiscal policy to better contain shocks and to provide incentives for better fiscal discipline at the national level. The expansionary phase of the cycle would be the best time to introduce a fiscal risk-sharing mechanism, especially if it needs to be built up through contributions from member states.

3. There is recognition that a euro area fiscal capacity would also be useful, but views differ on what it should entail, and political support is more tenuous than for other reforms. In September 2017, French President Emmanuel Macron called for a euro zone budget, including for investment and macroeconomic stabilization, combined with stronger compliance with the fiscal rules. In December 2017, the European Commission (EC) published a proposal for an EU budget instrument, including a stabilization function for the euro area; the EC proposed that, over time, the instrument could be developed into an investment protection scheme. More recently, the potential German coalition partners have supported calls for euro area stabilization to be part of the EU budget, suggesting that it could be a point of departure for an area-wide investment budget. However, concerns about risk sharing, moral hazard, and permanent transfers mean that it will be difficult to build political support for a mechanism that provides meaningful stabilization.

4. A variety of recent proposals have envisaged stabilization as a core element of a CFC, even if they target multiple goals. A CFC for investment that channels funds to areas of highest

¹ For example, see Aiyar and others (2015); Allard and others (2013); Andrieu and others (2015a); Berger, Dell'Ariccia, and Obstfeld (2018); Gaspar (2016); Goyal and others (2013); and IMF (2016), as well as euro area Article IV staff reports since 2011.

return can provide countercyclical support in downturns and boost long-term growth potential. A common unemployment insurance scheme that reinforces national schemes facilitates both countercyclical fiscal policy and social protection. Other proposals have focused on provision of common public goods, such as defense and border protection. However, logically these proposals apply to the broader EU rather than just the euro area, and none are intrinsically linked to making the euro area more resilient as a stabilization function.

5. This Staff Discussion Note (SDN) offers a concrete proposal for a stabilization function that could overcome concerns associated with greater risk sharing. It lays out how a CFC could be designed to balance economic objectives and political considerations. The Note also discusses the trade-offs associated with the proposed features and some alternatives. The paper intentionally does not address the institutional and legal setup of the CFC though, as these issues are secondary to its economic function and are best left for the stakeholders to determine.

Box 1. Recent Proposals for a Euro Area CFC

Interest in a central fiscal capacity (CFC) has resurfaced in the context of a wider discussion about deepening the Economic and Monetary Union (EMU), and the idea has attracted support from several European policymakers and academics.¹ The European Commission (EC) proposed in its December 2017 package a stabilization function to support investment at the European level, to be developed over time and starting with loans and a limited grant component (European Commission 2017b). In its December 2017 position paper on reforming the EMU, the Italian government argued for a rainy-day fund to support the unemployed, complemented by an investment protection scheme to support growth (Italian Ministry of Finance 2017). Similarly, a paper by the French Treasury proposed an investment protection scheme financed by cyclically sensitive revenue; namely, corporate income tax and value added tax (VAT) from common consolidated tax bases (Bara and others 2017). The German coalition agreement in February 2018 advocated a euro area budget line within the European Union (EU) budget that could focus on macroeconomic stabilization and could be developed into a euro area investment budget over time. Finally, a group of 14 leading economists from France and Germany recommended creating a CFC financed by national contributions that would function as a reinsurance fund to absorb large economic shocks (Bénassy-Quéré and others 2018).

The proposed options can be grouped into three main setups, according to how funds would be channeled to the economy:²

- **Contribution-transfer schemes** that provide cross-border risk sharing by reallocating funds across countries at (1) the individual level, such as a common unemployment insurance fund (Dolls and others 2015, 2016; Dullien 2014a, 2014b) or a reinsurance fund (Beblavý, Gros, and Maselli 2015); or (2) the country level, such as a rainy day fund (Carnot and others 2015; Carnot, Kizior, and Mourre 2017; Furceri and Zdzienicka 2015), which could also provide stabilization against area-wide shocks if it were equipped with a borrowing capacity.
- **Borrowing-lending schemes** that borrow from the market and on-lend the funds either to the public sector to boost public demand or to the private sector to protect investment in the face of shocks (Gaspar 2016; IMF 2016).
- **A dedicated budget for the euro area**, possibly managed by a euro area finance minister, that collects contributions/taxes from member states and spends, for instance, on common public goods such as joint investment, which could contribute not only to macroeconomic stabilization but also to convergence objectives (Macron 2017).

¹ For a sampling of papers on EMU deepening, see European Commission (2012 and 2017a), Van Rompuy and others (2012), Juncker and others (2015), Gaspar (2016), and European Parliament (2016a).

² See Allard and others (2013) and Berger, Dell’Ariccia, and Obstfeld (2018) for a detailed discussion of the economic case for further euro area fiscal integration. See Allard and others (2013), European Parliament (2016b), and IMF (2016) for a discussion of the pros and cons of each option.

ECONOMIC RATIONALE FOR A CENTRAL FISCAL STABILIZATION CAPACITY

6. A CFC, together with the Banking Union and the Capital Markets Union, would improve the limited risk sharing in the euro area. According to Constâncio (2017), only about 20 percent of idiosyncratic shocks to euro area countries’ GDP per capita are smoothed via cross-border risk sharing.² In comparison, about three-quarters of shocks are smoothed across the individual states in the United States, mainly by cross-border risk sharing in capital and credit markets but also by federal transfers. Completing the Banking Union and the CMU should improve private sector cross-border risk sharing, but it will not eliminate the need for public sector risk sharing.³ The Banking Union and CMU will require some time to fully develop and, even in the long term, private cross-border financial flows are likely to continue to be procyclical and to retract substantially during crises, as in 2008–09 and 2011–12. Even with a perfect Banking Union and CMU, there is still merit in fiscal risk sharing to help smooth country-specific shocks and to support aggregate euro area demand when monetary policy is constrained.⁴

7. A CFC for macroeconomic stabilization would improve the ability to achieve an appropriate policy mix for the euro area as a whole. In the absence of a CFC, the euro area remains overly reliant on monetary policy for stabilization. The lack of a common fiscal policy and procyclical fiscal rules were important drivers of the sharp procyclical fiscal tightening in most euro area countries during 2011–13.⁵ Even countries that were not under pressure from financial markets tightened significantly, which exacerbated the downturn. A CFC would provide space to prevent a procyclical fiscal adjustment in future downturns, especially in countries with high public debt.

² Furceri and Zdzienicka (2015) also find that cross-border private risk sharing through financial markets is limited in the EMU. European Commission (2016) also finds that, compared to the United States, a large share of unsmoothed idiosyncratic shocks in the euro area is due to less developed capital and labor market cross-border channels.

³ Barry Eichengreen and Martin Sandbu, for example, have recently argued that a sufficiently strong [Banking Union](#) and a sovereign debt restructuring mechanism would make greater [fiscal integration unnecessary](#).

⁴ See Berger, Dell’Ariccia, and Obstfeld (2018) for a fuller discussion of the literature on the benefits of fiscal risk sharing in a currency union relative to relying on self-insurance. The same authors also argue that introducing fiscal risk sharing can improve market discipline by making the “no bailout” clause more credible.

⁵ The cumulative fiscal adjustment by euro area countries over 2011–13 was around 3½ percent of euro area GDP as measured by the change in the structural primary balance.

(continued)

8. A CFC would enhance euro area countries' capacity to respond to both country-specific and area-wide shocks. It would also mitigate contagion risks by helping countries contain the impact of shocks.

- **Smoothing country-specific shocks.** A single monetary policy puts a larger burden on national fiscal policy to stabilize country-specific shocks. However, the severity of shocks differs across countries, and fiscal space is unevenly distributed. A CFC would strengthen countries' ability to respond to output fluctuations with countercyclical fiscal policy.⁶ Also, to the extent that cross-country spillovers are larger in a currency union, the case is stronger for ensuring that national fiscal policy responds countercyclically to shocks with support from the central level (see, for example, Poghosyan 2017).
- **Cushioning area-wide shocks.** A CFC would facilitate a better mix between fiscal and monetary policy in the event of an area-wide shock. It would be particularly useful when monetary policy is constrained (for example, at the effective lower bound) and fiscal space is limited in some member states by allowing a more countercyclical fiscal stance across countries, thereby improving growth and employment outcomes relative to the scenario without a CFC.

9. A well-designed CFC would ensure greater fiscal discipline by requiring countries to build buffers in good times and incentivizing compliance with the common fiscal rules.

Experience shows that many euro area countries did not build sufficient buffers in good times, reflecting weak policies, procyclical fiscal rules, and the fact that higher revenues generated by unsustainable domestic demand booms were wrongly deemed permanent (Allard and others 2013; Eyraud, Gaspar, and Poghosyan 2017). A CFC would ensure more countercyclical policies in good times by requiring net contributions from countries. Also, a CFC can provide an ex ante incentive for fiscal discipline by conditioning support in bad times on past compliance with the fiscal rules. A CFC focused on macroeconomic stabilization would also facilitate revamping the fiscal rules to simplify them and make enforcement more automatic.

10. A CFC would not be the answer for countries that require policy adjustment. In particular, countries with imbalances and competitiveness problems would have to address them through structural reforms at the national level. In the event of a large shock that pushes a country to the verge of losing market access and requires substantial adjustment, an ESM program with conditionality would be the appropriate support instrument. There is a grey zone where liquidity and solvency events overlap, and the former could morph into the latter. A CFC could shrink this grey zone by reducing the likelihood of self-fulfilling crisis dynamics causing spikes in borrowing costs that force countries to resort to ESM support ex post (IMF 2016). It would do so by effectively

⁶ Procyclical fiscal tightening in a country with high public debt could spark market concerns about growth and fiscal sustainability; hence, some countries could be "damned if they do and damned if they don't" when it comes to fiscal tightening in response to a negative shock. By mitigating the need for such procyclical fiscal policy responses, a stabilization capacity would reduce the likelihood of a sharp rise in sovereign borrowing costs. This, in turn, would reduce the risk of contagion such as that seen in 2011 and 2012.

redistributing fiscal space intertemporally without necessarily permanently enlarging it (that is, with the government budget constraint remaining binding in the long term).

GUIDING PRINCIPLES

11. Economic effectiveness and political feasibility are prerequisites for a workable CFC, implying trade-offs that delimit its design and size. These prerequisites inform the guiding principles of the CFC.

12. The CFC should be designed to provide meaningful macroeconomic stabilization. Improving stabilization should be the main objective of the CFC. While other objectives may be pursued in tandem, care should be taken not to inadvertently undermine the CFC's stabilization power by assigning it additional functions. In terms of size, the CFC should be large enough to play a meaningful stabilization role. But, it must also be affordable enough that countries are willing to participate in it, since CFC contributions entail an opportunity cost in terms of alternative uses for those budget resources.

13. Moral hazard risks must be mitigated. Specifically, the risk is that if countries receive some type of insurance against shocks from the CFC, then they may run less sustainable fiscal policies and build up less of their own buffers. To avoid this situation, the CFC would have to provide incentives for countries to maintain fiscal discipline. How well it does so will depend on the common fiscal rules and the countries' medium-term fiscal frameworks (MTFFs). This suggests that the fiscal rules should be reformed in conjunction with the development of a CFC to make them less procyclical and to provide better incentives for countries to abide by the rules. Making this work also requires stricter adherence to MTFFs that comply with the fiscal rules, with MTFFs designed so that fiscal policy is both sustainable and provides an appropriate degree of stabilization.

14. Fears that a CFC would become a transfer system in which high-performing countries habitually finance poor performers must be addressed. The euro area needs more risk sharing, but it is not a political union, and any scheme that would create ex ante permanent transfers between countries would be a political nonstarter. Thus, the CFC should be designed to avoid permanent transfers ex ante. Of course, for any specific period, some countries will be net contributors and others net beneficiaries, depending on the realized shocks. However, over a long enough time horizon, a country's net position with such a CFC should be close to balanced. Our proposal will incorporate design features that can help avoid permanent transfers.

15. Making the CFC as automatic as possible can help prevent disputes over its operation. Reaching agreement on a CFC and its features is clearly a political process. However, once those issues are decided, the design of the CFC should seek to make its functioning and key operational parameters as simple and automatic as possible to minimize the scope for disputes and discretion. Past experience—such as with the output gap calculation that informs the assessment of the structural fiscal balance—shows that significant disagreements can emerge over how key parameters are measured or calculated, which could undermine support for the CFC.

CFC PROPOSAL

16. This section outlines a CFC with features that seek to satisfy the guiding principles. The proposed CFC is just one satisfactory combination of features. The discussion covers some alternatives that would also satisfy the principles, but with a different mix of pros and cons.

17. The main features of our CFC proposal are:

- A dedicated **macroeconomic stabilization fund** that makes transfers to countries in bad times and is **financed by regular annual contributions** from countries' budgets that would be used to build up assets in good times (that is, a rainy-day fund).
- A **borrowing capacity** would be available to the CFC in case of exceptionally large common shocks requiring transfers that would exhaust the fund's assets.
- **Transfers** to countries would be **automatically triggered** by a cyclical indicator and would be **proportional to cyclical fluctuations** in this indicator. The deviation of the unemployment rate from its moving average could be a suitable trigger. In this case, transfers would be proportional to the unemployment rate deviation.
- The CFC would **mitigate moral hazard** by requiring that countries comply with fiscal rules before they could receive transfers in excess of their cumulative net contributions.
- To ensure political acceptability, the CFC should be designed to **avoid permanent transfers**. Several mechanisms to achieve this goal are considered below.

A Macroeconomic Stabilization Fund

18. The CFC would improve stabilization through contributions and transfers that counterbalance fluctuations in revenue and cyclical spending. It would help countries adhere as smoothly as possible to their medium-term spending plans. Contributions to the CFC would come from national budgets. The CFC would need to invest in safe and liquid assets to ensure its ability to meet its commitments when transfers are triggered. Transfers from the CFC to national budgets would be triggered automatically by a cyclical indicator.⁷

- For countries with limited fiscal space, the transfers from the CFC would help them avoid a procyclical fiscal tightening in a downturn when revenues fall and cyclical expenditures rise. For countries with fiscal space (that is, those that would have no difficulty financing larger deficits

⁷ Because the envisaged CFC contributions and transfers are final (that is, they do not create a right to be fully repaid on the part of a country or the CFC), they should be treated as expense/revenue in the fiscal accounts rather than a below the line financing operation. Of course, the statistical treatment would depend in part on the exact legal/institutional setup of the CFC, which would require consultation with Eurostat.

(continued)

following a shock), the transfers from the CFC would limit the increase in government deficits and debt that would have occurred otherwise.⁸

- In the event of very large common shocks—such as those that would justify activating the Stability and Growth Pact’s (SGP) escape clause—where automatic stabilizers do not provide a sufficiently countercyclical fiscal response, coordinated discretionary spending increases (for example, on public investment) could also be financed by transfers from the CFC.⁹

19. Successful stabilization would depend on countries faithfully implementing their medium-term expenditure plans and allowing automatic stabilizers to operate when receiving transfers. As a prerequisite, all euro area countries would have to have in place full-fledged MTFs that are consistent with the common fiscal rules. The European Semester process provides an opportunity for external review of the plans to check their consistency with the rules.¹⁰

Some Alternative Types of CFCs

20. An alternative would be a contribution-transfer scheme that operates at the individual rather than the national level, such as a common unemployment insurance fund (UIF). A common UIF would be financed by a share of individuals’ social security contributions and would make transfers to unemployed persons. It could be designed to provide a basic level of insurance that could be topped up by national unemployment benefit schemes (Dullien 2014a, 2014b). Both contributions and benefits would move countercyclically, with the former falling during downturns and the latter (funded by other countries’ contributions) rising. Such a risk-sharing mechanism would serve both stabilization and social protection objectives. However, compared with a rainy-day fund, a common UIF would provide less flexibility for countries to choose how best to finance and benefit from a CFC. In addition, the extent of stabilization provided by a common UIF would be limited to the share of unemployment benefits it provides, diminishing its ability to smooth large shocks. Moreover, a rainy-day fund would not require the degree of harmonization of labor market regulations and unemployment benefit scheme rules that would be needed for a UIF.

21. A borrowing-lending scheme (BLS) is a commonly discussed alternative to contribution-transfer schemes. The borrowing entity (that is, the CFC) would receive capital

⁸ The income earned on assets in the CFC could be credited against the contributions of countries that are net contributors to the CFC. Calculations suggest that this income would be relatively modest if the fund accumulates at most a couple percent of euro area GDP and invests in safe assets. The income would be allocated to net contributor countries (that is, those that have contributed more to the CFC than they have received over time) based on their share of the cumulative net contributions.

⁹ The triggering of the SGP escape clause, as well as the coordination and composition of any stimulus, are decisions that would be outside the functioning of the CFC mechanism, so they are not covered here.

¹⁰ This also does not preclude the possibility that structural fiscal adjustment may be needed in response to some shocks. In such cases, revisions to a country’s MTF should be made in consultation with the EU institutions, partly to ensure that the pace and composition of adjustment are as growth-friendly as possible.

(continued)

contributions from euro area members, similar to the setup of the ESM.¹¹ The CFC would borrow from the market, with low borrowing costs reflecting the capital commitments, and would lend on to member states (see IMF 2016). In contrast to the macroeconomic stabilization fund, a BLS would not entail temporary transfers across countries. One benefit of such a scheme is that it involves less of a moral hazard risk, as countries would have to fully repay the CFC over time. It might also be politically easier to establish a BLS in the short term. However, a few issues make such a mechanism less desirable than a CFC that makes transfers. First, the fiscal space created by a BLS would effectively be the difference between what a country pays to borrow from financial markets and what it pays to borrow from the CFC.¹² In the short run, this is likely to be small. Second, since the borrowing from the CFC still creates a debt liability for the member country, it would not necessarily alleviate concerns about debt sustainability or avoid a spike in sovereign bond yields. Third, only countries with borrowing costs above the CFC's would have an incentive to borrow from the CFC.

22. Another option would be a euro area budget. The degree of macroeconomic stabilization this option could provide would depend on the types of revenue and expenditure delegated to it. But a budget that focuses on providing common goods, such as defense and border protection, would probably not be adequate for stabilization purposes unless the revenues paid into the budget were cyclical (in which case it would need a borrowing capacity) and the spending purposes assigned were large enough to affect the macroeconomy.¹³ Moreover, such matters are not essential to addressing the euro area's vulnerabilities, and the EU budget would be a more appropriate platform. Embedding a euro area budget line within the EU budget is also an option, but this would not provide sufficient resources for stabilization if provided within the current EU budget envelope (less than 1 percent of GDP).

CFC Size and Financing

23. The size of the CFC will be a trade-off between the desired degree of stabilization and the opportunity cost of the resources devoted to the CFC. The larger the annual contributions, the greater the risk that governments will cut productive public spending or increase distortionary taxes. Moreover, reaching political agreement among member states on large annual contributions would be difficult. The scope of the potential stabilization, and the required contributions, are discussed below in the section looking at how the CFC would perform.

¹¹ As for the ESM and the European Investment Bank, the funds borrowed from the market would be recorded on the balance sheet of the CFC and would not increase national debts, as the borrowing by the CFC would only be a contingent liability for the member countries. However, the lending from the CFC to a country would count as debt on the balance sheet of that country.

¹² This would be limited, because in cases of severe shocks where a member state loses market access, lending through the BLS would likely be discontinued and replaced by conditional ESM lending.

¹³ This was one of the options discussed in the EC's March 2017 White Paper (European Commission 2017c) following up on the 2015 Five Presidents' Report (Juncker and others 2015). French President Macron has also raised such ideas in the EU context.

(continued)

24. The CFC could allow countries to decide how to fund their contributions, as long as they respect the fiscal rules. Some previous proposals envisaged assigning the CFC a direct revenue stream from taxes, either by earmarking existing taxes or developing a new area-wide tax. However, this would limit a country's flexibility in choosing how to finance its contribution. Given the heterogeneity among countries, it is probably desirable to allow each country to determine the best way to pay its CFC contribution.¹⁴

25. While our proposal envisages constant annual CFC contributions, another good option would be to allow contributions to fluctuate over the cycle.¹⁵ The same stabilization impact in downturns (net contributions) could be achieved with either approach. Constant annual contributions have the advantages of being transparent and predictable for preparing budgets and medium-term frameworks, as well as providing an assured flow of income to service any borrowing by the CFC. Cyclically varying contributions have the advantage of increasing the countercyclicality of the CFC in good times, as contributions would have to be larger in good times than the constant annual contributions, to make up for years when they were not paid. With cyclically varying contributions the size of gross transfers would be smaller in bad times to yield similar net transfers.

26. The CFC should also have a borrowing capacity, though it should only need it in the event of an exceptionally large or persistent common shock. A borrowing capacity would ensure that the CFC could provide the prescribed transfers when its assets were exhausted. For instance, in the event of a large common shock in which monetary policy approaches the effective lower bound, a borrowing capacity would help ensure that the aggregate fiscal policy response is adequately countercyclical. To ensure the smooth provision of transfers, the borrowing capacity would be activated when the fund's assets were projected to fall below a certain threshold.

CFC Trigger

27. Achieving agreement on an appropriate objective trigger for transfers is essential. Specification of an acceptable trigger has been a stumbling block in earlier proposals for a CFC. In theory, the output gap would be the best candidate for a cyclically sensitive trigger. But, in reality the output gap is unobservable and estimates are often revised dramatically—by almost 1½ percent of GDP on average for EU countries (Tereanu, Tuladhar, and Simone 2014)—making it a poor candidate for a trigger that has to operate in real time.

28. The unemployment rate is a better cyclical indicator to use as a CFC trigger. The goal is to define an acceptable proxy for the output gap. The unemployment rate is harmonized across

¹⁴ A country with a structural surplus well above its medium-term objective (for example, Germany) could pay the contribution by reducing its surplus. For other countries, maintaining compliance with the fiscal rules implies fiscal adjustment to avoid a deterioration of the structural balance. In some countries (for example, France) it might be preferable to offset the cost of the CFC contributions with expenditure cuts elsewhere. In others (for example, Spain) higher revenue may be called for instead.

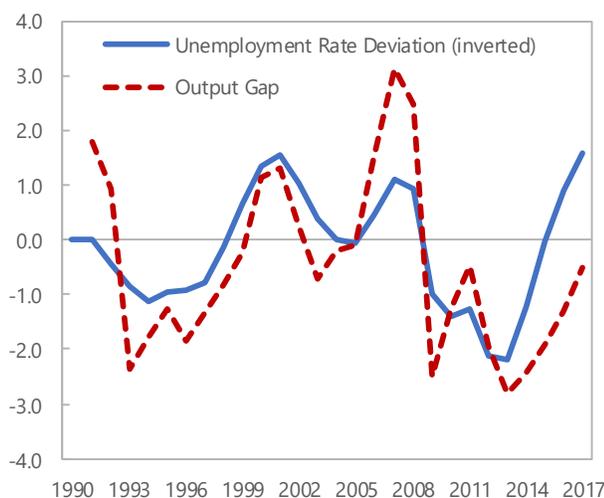
¹⁵ For example, Carnot, Kizior, and Mourre (2017) proposes a stabilization capacity with contributions that are paid only when unemployment is below its long-term average and decreasing.

(continued)

euro area countries and is more easily observable than other cyclical indicators, such as the output gap or GDP growth. Also, ex post revisions to the unemployment rate are relatively smaller than those for the output gap or real GDP growth (see Technical Appendix).¹⁶

29. The deviation in the unemployment rate from its long-run moving average is a reasonable proxy for the output gap. For the euro area overall, the inverse of the deviation of the unemployment rate from its long-run moving average is also highly correlated with the (ex post) estimated output gap (Figure 1), making it a decent proxy for the output gap. However, to the extent that Okun's law (the relationship between changes in unemployment and changes in the output gap) varies over time, labor market conditions may not always perfectly reflect the cyclical state of the economy. Another benefit of using the unemployment rate deviation from the moving average is that it reduces the risk that transfers are made to countries because of high structural unemployment. This takes into account that the unemployment rate is in part a result of countries' own labor market policies and that some countries have much higher unemployment rates than others.

Figure 1. Output Gap versus Unemployment Rate Deviation
(Percentage points)



Sources: IMF World Economic Outlook and staff calculations.
Note: The unemployment rate deviation is measured as the difference between the unemployment rate and its seven-year moving average. It is inverted to illustrate the correlation, as the unemployment deviation will be positive when the output gap is negative.

30. The specification of the trigger—in particular, the period over which the moving average is calculated—would affect the size and duration of the transfers provided. A shorter period would bring the moving average closer to the actual unemployment rate, which would reduce the countercyclicality of the transfers. At the same time, there can be persistent trends in unemployment rates—up or down—driven by changes in structural unemployment. The use of a long moving average period could end up generating transfers owing to these structural changes in unemployment rates rather than to cyclical fluctuations. The deviation in the unemployment rate from a seven-year moving average appears to achieve a reasonable balance between these two concerns. This is in line with European Central Bank

¹⁶ While the CFC would have to make transfers based on real-time data, using the unemployment rate deviation as a trigger would reduce the risk that countries would receive transfers that were later deemed unwarranted based on the revised data. Once a transfer has been made, a country would not need to repay the portion that might be considered excessive based on revised data (that is, if the unemployment rate were revised down ex post). Conversely, a country would not get additional transfers after the fact if the revised data indicated that it should have received more.

(continued)

(ECB) research (Giannone, Lenza and Reichlin 2009), which finds that euro area business cycles range from six to nine years. It is also close to estimates—based on data from the Center for Economic and Policy Research Business Cycle Dating Committee—that find the average length of the euro area business cycle since 1974 has been about eight years.¹⁷

31. How the trigger is defined can have distributional implications for transfers. There are differences in the volatility and speed of changes in the unemployment rate across euro area countries. For example, using the *percent* deviation of the unemployment rate from its moving average instead of the *percentage points* deviation would have an impact on the transfers received by some countries, even if the aggregate euro area transfers are similar (see Technical Appendix). This is one reason why agreement on a trigger is so difficult.

Some Alternative Triggers

32. A “double condition” on the unemployment rate, as proposed by Carnot and others (2017), would be a reasonable alternative trigger. The “double condition” on the unemployment rate is that it must be both above its moving average and increasing to trigger transfers. This approach puts more restrictions on the period over which transfers are provided. In choosing a trigger, there is a trade-off between the countercyclicality of the CFC support and the political concern that transfers are perceived as excessive and going to countries that are doing well (that is, unemployment is falling but still above the moving average). The “double condition” places more weight than our proposed trigger on the latter concern.

33. Real GDP growth deviations are a less appealing alternative CFC trigger. In this case, the trigger would be the difference between real GDP growth and its moving average or trend. However, GDP growth is subject to larger revisions, as noted earlier, and is more volatile than the unemployment rate.¹⁸ If it is measured as a deviation from its moving average, it is less countercyclical than the unemployment gap, because growth rates start picking up after the trough of a cycle, well before the unemployment gap is closed. In addition, euro area GDP growth is not very well correlated with the output gap and is therefore a poor proxy for it.

Transfers

34. Transfers would be proportional to the deviation of the unemployment rate from its moving average. For example, transfers worth ½ percent of the recipient country’s GDP could be made for every 1 percentage point deviation of the unemployment rate above its moving average. Thus, unemployment would need to exceed the moving average by ¾ percentage points to generate *net* annual transfers (that is, gross transfers net of contributions). Calculations based on

¹⁷ Data are available at <https://cepr.org/content/euro-area-business-cycle-dating-committee>.

¹⁸ The Technical Appendix contains an analysis of the transfers that would be made using real-time and ex post data for the unemployment rate and real GDP growth deviations. The differences in the transfers between the data vintages are much smaller for the unemployment rate. We would like to thank the authors of Carnot and others (2017) for kindly sharing their data set of real-time and ex post observations.

historical data suggest that transfers of this size would provide meaningful support (see the following section and the Technical Appendix). Nevertheless, countries would still need their own buffers as well. At the peak of the cycle, unemployment would be below the moving average, so it would take some time for unemployment to exceed the average and for transfers to kick in. Moreover, the CFC is *not* calibrated to completely compensate countries for the extent of deficit fluctuations due to automatic stabilizers.

35. Earmarking the use of CFC funding would be possible, but it would limit the extent of stabilization provided. Our proposal does not envisage linking transfers to a particular spending purpose, as fiscal priorities will probably vary depending on the country and circumstances. However, if euro area stakeholders prefer to prioritize specific objectives, transfers could be earmarked; for example, for spending on large-multiplier items (such as maintaining public investment during downturns) or to finance cyclical spending (such as unemployment benefits). The earmarked spending would have to be large enough in government budgets to plausibly deliver the targeted stabilization. For this reason, an earmarked CFC would likely be insufficient for large area-wide shocks.

Avoiding Permanent Transfers

36. The political feasibility of the CFC will probably depend on building stakeholder confidence that it will not turn into a permanent transfer mechanism. A well-designed stabilization mechanism must avoid permanent transfers. Accomplishing this goal will depend on the CFC trigger and the size of transfers relative to contributions, as well as the income earned on assets that is credited to net contributor countries (although this income will likely be small). The mechanism outlined earlier will not be sufficient to prevent permanent transfers, so additional features would be required (see next section as well).

37. Some options to reduce the risk of permanent transfers:

- **A usage premium.**¹⁹ Countries would pay additional contributions based on past use of the fund and their cyclical position, just as drivers pay more for insurance after an accident. After they have benefited from the CFC, countries would only pay the usage premium once the economy has recovered (that is, once the unemployment rate falls below its moving average). This would help bring their net position back to balance faster. The usage premium would have to be carefully calibrated to ensure that it is not so onerous that it nullifies the fiscal risk-sharing objective but is still large enough to mitigate the likelihood of permanent transfers.
- **A cap on cumulative net transfers.** Cumulative net transfers to a single country could be capped. While a cap that limits the support for macroeconomic stabilization is economically suboptimal, it may be necessary to address concerns that a CFC would entail permanent

¹⁹ The idea of a usage premium is inspired by Carnot Kizior, and Mourre (2017).

(continued)

transfers to countries with increasing structural unemployment. A cap would also help ensure that the CFC is not a substitute for necessary policy adjustment.²⁰

- **A cap on cumulative net contributions.** Better-performing countries that have long expansionary periods could become sizable net contributors, even after earning their proportional share of the income on the fund's assets. Putting a cap on the cumulative net contributions may be necessary to make the CFC politically palatable. However, this would limit the assets built up in good times and make it more likely that the CFC would need to use its borrowing capacity.

Supporting Fiscal Discipline

38. An automatic link between compliance with the rules and CFC transfers would reduce moral hazard risks and create incentives for better compliance. Transfers from the CFC that exceed a country's cumulative net contributions (that is, the cross-country risk sharing component), could be contingent on compliance with EU fiscal rules. One option would be to set transfers proportional to the country's rate of compliance with the rules over the past several years. In this case, being assessed as noncompliant once over the past several years would not lead to an immediate suspension of net transfers, but it would decrease them. Net transfers would continue to be reduced the longer a country was noncompliant, and after an agreed upon number of years, transfers would be suspended entirely.

39. Simpler rules, allowing more automatic enforcement, would facilitate the link between compliance and CFC transfers. The complexity and number of rules in the current framework make it more challenging to determine whether a country is compliant. Streamlining and simplifying the fiscal rules would make it easier to monitor and more transparent, supporting the link between compliance and CFC transfers. As proposed previously by IMF staff, shifting to a single fiscal anchor, such as the debt ratio, would help shift the focus to debt sustainability (see IMF 2014, Andrieu and others 2015a, and Eyraud and Wu 2015). It could be combined with an expenditure growth rule as the operational target, complemented by a debt-correction mechanism to better link the rule to the anchor. This approach would be consistent with the proposed functioning of the stabilization fund, with countries using transfers during downturns to help them maintain the spending laid out in their medium-term fiscal plans.

²⁰ Another option, which might eliminate the need for a cap on cumulative net transfers, would be to have a convex usage premium that grows increasingly fast as the cumulative net transfers to a country rise. This would effectively make the CFC transfers too expensive to be worth accepting after a certain point. However, it would be more complicated to communicate and calibrate than a linear usage premium and cap on cumulative net transfers.

HOW WOULD THE PROPOSED CFC PERFORM?

40. This section assesses whether our proposed CFC would deliver enough stabilization to make it economically worthwhile, at a modest enough cost to make it politically feasible.

41. To assess how the CFC would perform, we use the following two approaches:²¹

- To measure the extent of stabilization that could be delivered by the CFC under different shocks, we use EUROMOD.²² A multi-country general equilibrium approach is needed to determine how model contributions and transfers will affect output and unemployment.
- For a more granular check on how the CFC would behave, we use historical data for 1990–2017.²³ History does not, of course, capture the stabilization impact the CFC would have had, but simulating the hypothetical financial flows to and from the CFC as if it had existed throughout recent history allows us to explore its properties (that is, how contributions and transfers would have evolved, the impact on specific countries, and a check on the “no permanent transfers” requirement). This gives us information needed to calibrate the features of the CFC to meet its goals of effectiveness, affordability, and long-term distributional neutrality.

General Equilibrium Model Simulations

42. We examine various scenarios to illustrate how the CFC would perform in circumstances similar to the recent euro area crisis. The main shock scenario is calibrated to roughly resemble that crisis.²⁴ The shock has three components: (1) a drop in private investment and consumption, (2) sovereign and corporate risk premium spikes in countries with higher public debt levels, and (3) a procyclical fiscal consolidation similar in size to the tightening in the euro area structural balance in 2011–12. The fiscal consolidation happens through cuts to public consumption and investment and exacerbates the hit to private demand. The risk premium shocks and the extent of fiscal adjustment countries implement depend on their public debt level. Some countries have no risk premium shock and adjust less than average (for example, Germany). Others have a moderate rise in the risk premium and implement an intermediate amount of fiscal adjustment (for example, France). Those with the highest debt levels have the largest risk premium shock and do the most fiscal consolidation (for example, Italy). This differentiation across countries is motivated by

²¹ This section provides an overview of key results. For more details, see the Technical Appendix.

²² EUROMOD is a version of the Flexible System of Global Models. These models are forward-looking semi-structural global general equilibrium models that include 24 countries/regions. EUROMOD includes the 11 largest euro area countries plus a block for the rest of the euro area and 12 other countries/regions (for details, see Andrieu and others 2015b).

²³ The time series starts in 1990 so that it is long enough to include at least two full economic cycles for each country, even though the euro was not introduced until 1999.

²⁴ We also modeled a smaller shock scenario to assess the behavior in more typical recessions, but the results exhibited similar dynamics to the larger shock scenario, so they are left to the Technical Appendix.

(continued)

countries' behavior during the euro area crisis, when those hit by spikes in sovereign borrowing costs adjusted much more than others.²⁵ We also differentiate between the case in which monetary policy is unconstrained and the one in which monetary policy is constrained at the effective lower bound. This is important empirically both because of the recent crisis and because monetary policy could be constrained for a prolonged period going forward.

43. To assess how much stabilization the proposed CFC could provide, we compare the shock scenario with and without a CFC. In this exercise, countries make annual contributions and build up assets in the stabilization fund before the shock, then transfers to countries are triggered by and proportional to the unemployment rate deviation from its moving average. The transfers from the CFC are used to reduce the amount of procyclical fiscal consolidation. The presence of the CFC also mitigates the risk premium shock.²⁶ Figure 2 illustrates the output impact of the shock scenario when monetary policy is free to respond to shocks (left panel) and when it is constrained at the effective lower bound (right panel). Each panel shows the shock scenario without a CFC (red line) and with a CFC along the lines we propose (blue line). The difference between the scenarios shows how much of the shock the CFC smooths, including due to lower risk premium shocks.

44. The CFC clearly provides considerable stabilization—and even more when monetary policy is constrained. Looking at Figure 2, we can see how much of the difference between the full shock scenario (red line) and the baseline (*x*-axis) can be smoothed by the CFC consistent with our proposal (blue line). When monetary policy is unconstrained (upper left panel), having the CFC reduces the impact of the shock by nearly one-third. When monetary policy is constrained (upper right panel), the CFC reduces the impact of the shock by nearly three-fifths.²⁷ The impact of the shock is larger when monetary policy is constrained because interest rates cannot be cut to mitigate the shock. While fiscal multipliers in the model are endogenous, they are effectively higher when monetary policy cannot at least partially offset the effects of fiscal consolidation. The lower panels in Figure 2 show the impact on inflation in the respective scenarios. The CFC improves inflation outcomes by supporting a better macroeconomic policy mix and, in particular, by reducing the risk of a debt-deflation spiral emerging when monetary policy is constrained.²⁸

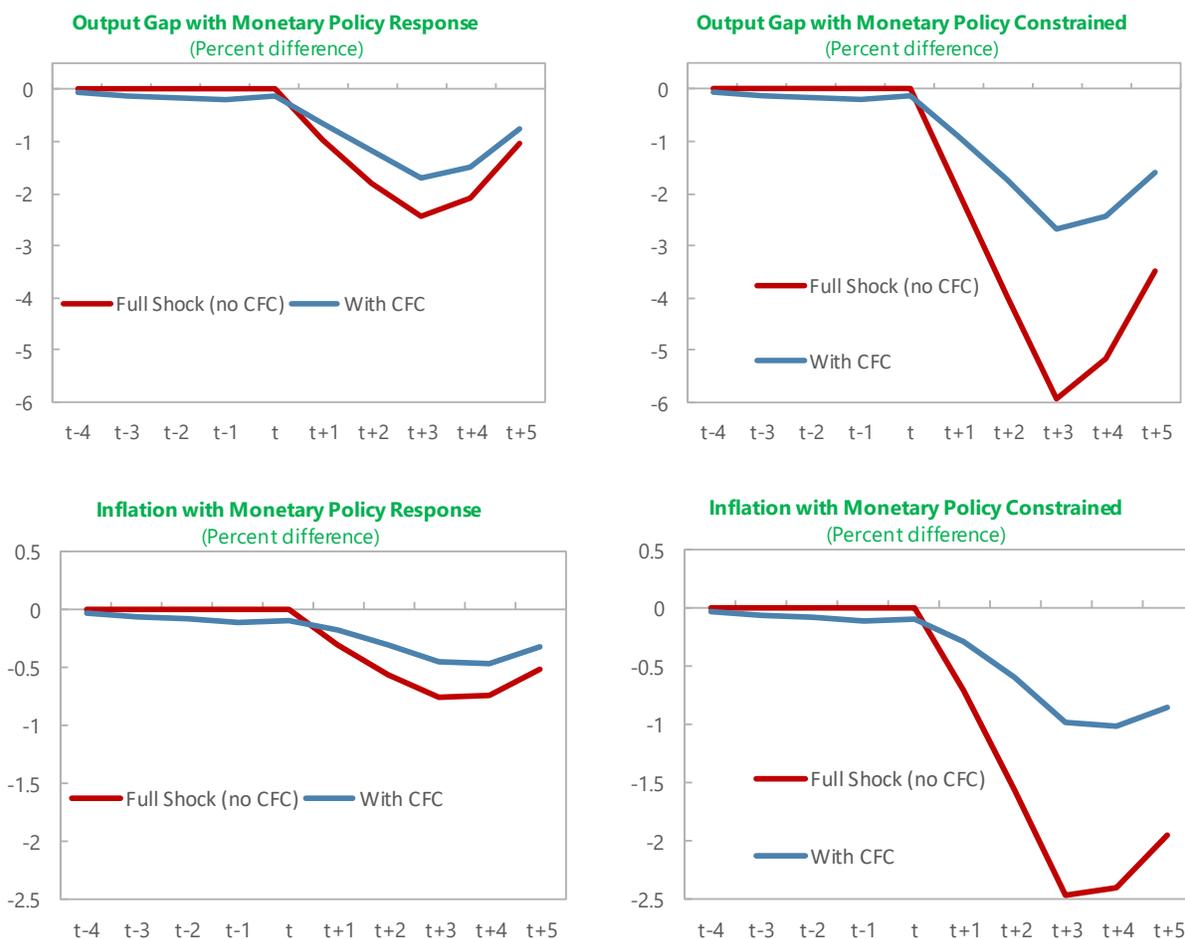
²⁵ This fiscal consolidation shock for each group of countries mimics the adjustment they made in 2011–12, which was driven in part by rising sovereign yields in some countries as well as procyclical fiscal rules. See Box 2 in the Technical Appendix for details.

²⁶ By design, the CFC eliminates the risk premium shock for the intermediate public debt level countries (for example, France) and reduces it by five-sixths for the high debt level countries (for example, Italy), which contributes to the smoothing the CFC provides. This is motivated by the idea that having a CFC would reduce the increase in countries' debt levels during downturns and reduce the risk of self-fulfilling crisis dynamics emerging in sovereign bond markets.

²⁷ The CFC would provide a similar relative degree of support in the smaller shock scenario, though the size of the transfers would obviously be less.

²⁸ See Gaspar, Obstfeld, and Sahay (2016) for a discussion of how a comprehensive, consistent, and coordinated approach to macroeconomic policymaking can help counter shocks and improve economic resilience.

Figure 2. Shock Scenarios—Output and Inflation Impact



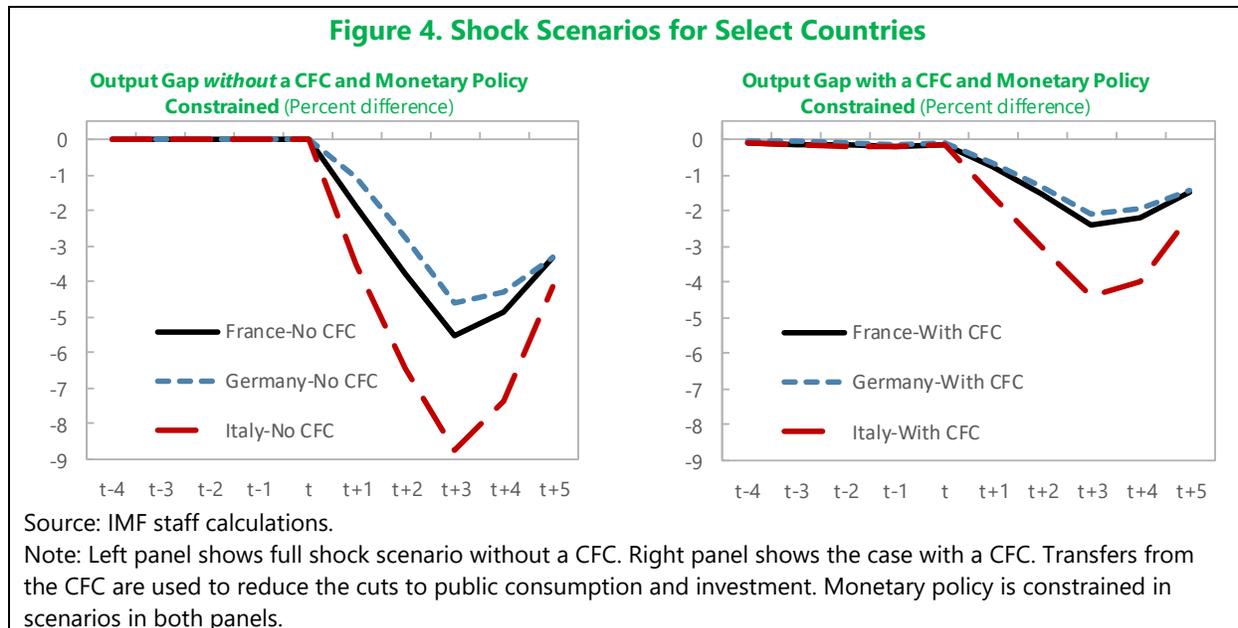
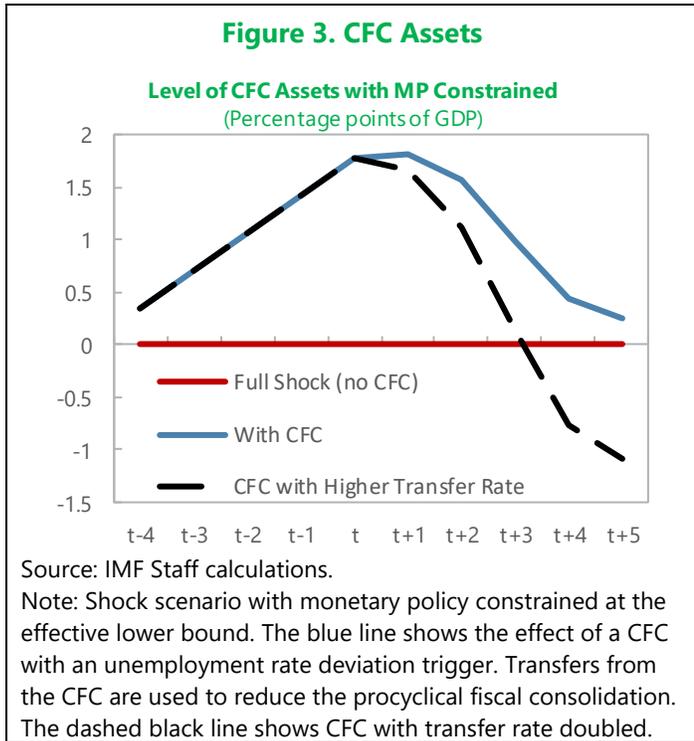
Source: IMF staff calculations.

Note: Shock scenarios with full monetary policy response (left) and with monetary policy constrained at the effective lower bound (right). The blue line shows the effect of a CFC with an unemployment rate deviation trigger. Transfers from the CFC are used to reduce the cuts to government absorption. Inflation figures show percent difference from the baseline (for example, from 2 percent).

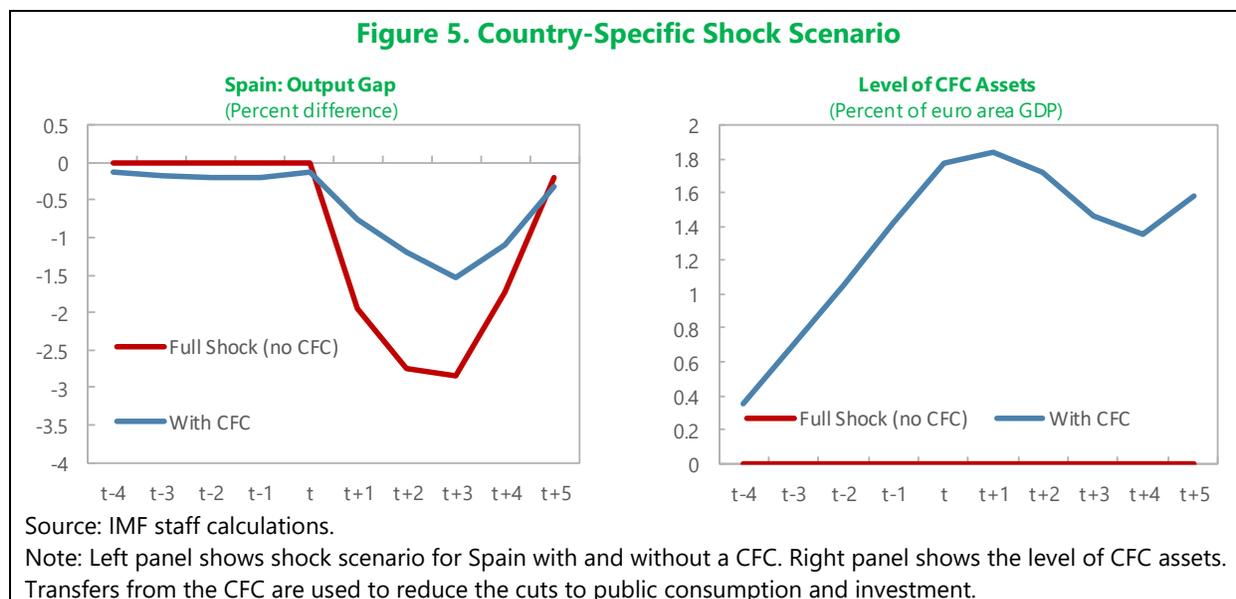
45. The case for a borrowing capacity can also be seen. While the calibration along the lines of our CFC proposal would have been able to rely on the assets built up (blue line, Figure 3), increasing the transfer rate to smooth more of the shock would have caused the CFC to borrow (dashed black line). This suggests that countries need to build their own buffers and that the CFC needs a borrowing capacity.

46. Looking at results for individual countries shows that the CFC also helps reduce divergences between countries when shocks hit. Figure 4 illustrates the output impact on France, Germany, and Italy of the shock scenario without a CFC (left panel) and with a CFC (right panel) when monetary policy is constrained.

Without a CFC, at the trough the output gap for Italy (red dashed line) is more than 4 percentage points lower than that for Germany (blue dashed line) because of the risk premium shock Italy experiences combined with the larger fiscal adjustment it implements. With a CFC (right panel), not only is the shock impact reduced for each country, but the difference between the output gaps for Italy and Germany is reduced by half, to just over 2 percentage points. The more modest difference in the shock impact for France (black line) and Germany is also reduced with a CFC.



47. A country-specific shock scenario confirms the benefits of the CFC. Euro area monetary policy usually does not respond to shocks in most individual countries, which implies a role for a CFC to support macroeconomic stabilization in the event of such shocks. To illustrate this, we model a shock to Spain alone that is similar to the main area-wide shock scenario described earlier and assess how much the CFC helps to smooth the shock when area-wide monetary policy is unconstrained.²⁹ Figure 5 shows that the CFC smooths about half of the country-specific shock impact (left panel). It also shows that the CFC assets are more than sufficient to cover the prescribed transfers, even with a large shock in a relatively large euro area country.



Calculations Using Historical Data

48. With assurance that the CFC could achieve substantive stabilization, the next step is to check that its design would satisfy the other guiding principles.

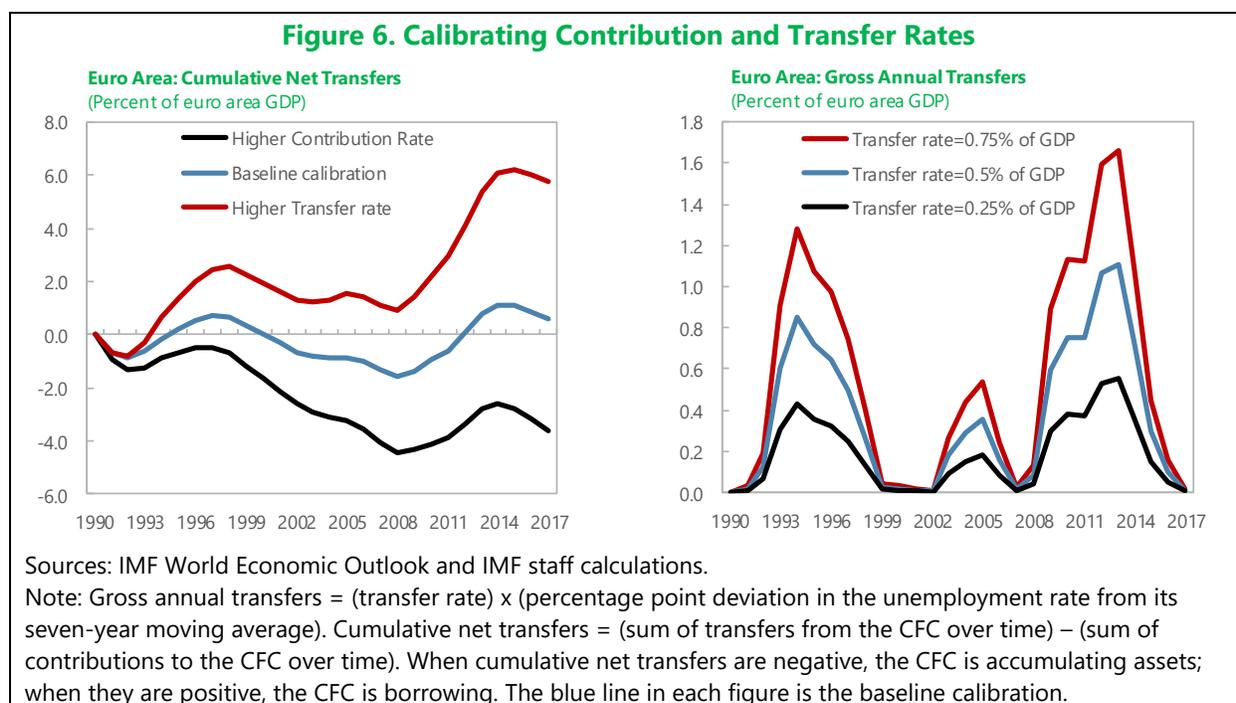
49. Calculations using historical data allow us to assess how various features of the CFC would have affected its behavior. In turn, this assessment provides key information for calibrating the CFC so that the distribution of transfers is reasonable and avoids countries becoming either permanent users of transfers or permanent contributors. In particular, the analysis based on historical data explores the effects of variations in (1) the size of contributions and transfers, (2) the choice of a trigger, and (3) mechanisms to avoid permanent transfers.

50. Again, we find that modest annual contributions would be sufficient to finance a meaningful stabilization capacity.

²⁹ While the size of the shock to Spain alone is similar to that in the main area-wide shock scenario, the output impact is smaller because the other countries are not being shocked, so there are no spillovers to Spain from them.

(continued)

- The baseline calibration assumes that (1) the CFC starts in 1990, (2) each country pays annual contributions of 0.35 percent of GDP, (3) transfers to a country are triggered by the deviation in the unemployment rate above its seven-year moving average, and (4) countries receive transfers of 0.5 percent of GDP for every 1 percentage point deviation.³⁰
- Under this calibration, the CFC would have built up assets worth 1.6 percent of euro area GDP before the global financial crisis (blue line, left panel Figure 6). The assets would have financed the prescribed transfers until 2012 and the borrowing capacity would have been used during 2013–17.
- Total CFC borrowing would have peaked at 1.1 percent of euro area GDP in 2014, then declined to 0.6 percent of GDP by 2017.
- The aggregate annual gross transfers provided by the CFC would have peaked at 1.1 percent of euro area GDP in 2013 (blue line, right panel, Figure 6). Of course, some countries would have received larger transfers than others, depending on how poorly they performed during the crisis. For the hardest hit countries, gross annual transfers would have averaged 2½ percent of their respective GDPs over 2009–13.



51. The analysis suggests that CFC contributions and transfers should be calibrated simultaneously, taking into consideration the desired size and stabilization capacity. Setting the contribution rate too high or the transfer rate too low will lead to a potentially excessive accumulation of assets in the CFC fund, which, as discussed earlier, can have real costs (black line,

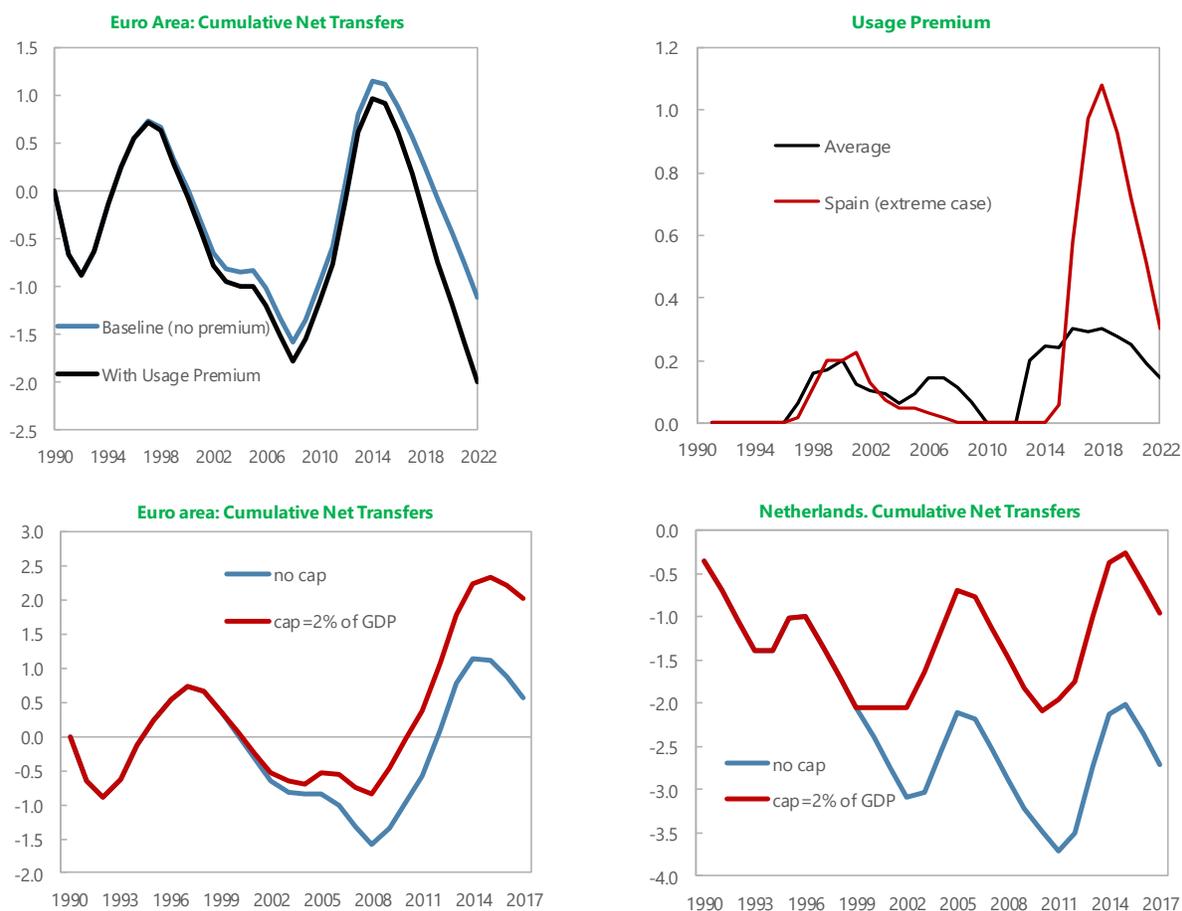
³⁰ This calibration does not include mechanisms to avoid permanent transfers, which are discussed later.

left panel, Figure 6). At the same time, setting the contribution rate too low or the transfer rate too high could cause the CFC to have to rely on its borrowing capacity more frequently, which may make it politically less palatable to some countries (red line, left panel, Figure 6). A balance must be struck between setting the size of the contributions to build up sufficient assets to finance the required transfers in typical recessions and setting transfers to provide meaningful support for macroeconomic stabilization (right panel, Figure 6). Our results suggest that contribution rates between $\frac{1}{4}$ and $\frac{1}{2}$ percent of GDP per year would provide sufficient resources, while the transfer rate should be about 0.5 percent of GDP or slightly higher, depending on the trigger.

52. Different mechanisms meant to prevent permanent transfers would also affect the likelihood that the CFC would have to borrow. The effects of a cap on cumulative net transfers can be easily inferred from Figure 6. Namely, depending on the level of the cap, it would cause cumulative net transfers to peak at a slightly lower level. Here we focus on a usage premium and a cap on cumulative net contributions.

- **Usage premium.** As previously discussed, the premium could be charged on the basis of a country's past use of the CFC and its cyclical position. The upper panels in Figure 7 illustrate how the CFC evolves with the usage premium (upper left panel, black line) compared with the baseline calibration without a usage premium (upper left panel, blue line). The figure uses *World Economic Outlook* projections out to 2022 to show how the usage premium helps rebuild assets and pay down borrowing in the fund after a large shock such as the recent crisis. For countries that would pay a usage premium after the crisis, the average is about $\frac{1}{4}$ percent of GDP per year at most (upper right panel, black line). However, Spain—the most extreme case—would have to pay at the peak about 1.1 percent of its GDP under our simple usage premium formulation (upper right panel, red line). This is rather high, which highlights how important it is to get the design and calibration of the usage premium right.
- **Cap on cumulative net contributions.** The lower left panel in Figure 7 illustrates how a cap on net contributions would affect the CFC's finances in aggregate—limiting the buildup of assets in good times and thereby increasing the extent to which the CFC might have to rely on its borrowing capacity. Such a cap would also affect individual countries' net positions with the CFC. For example, without the cap on cumulative net contributions, the Netherlands' net cumulative contributions to the CFC would have grown with each expansionary phase of the cycle without fully reversing during the downturn (lower right panel, blue line). But, with the cap its net position would have reverted to nearly balanced during the crisis (lower right panel, red line).

Figure 7. Usage Premium and Cap on Cumulative Net Contributions
(Percent of GDP)



Sources: IMF World Economic Outlook and staff calculations.

Note: Cumulative net transfers = (the sum of transfers from CFC over time) – (sum of contributions to CFC over time). When cumulative net transfers are negative, the CFC is accumulating assets; when they are positive, the CFC is borrowing. A country's total contributions = (regular annual contribution) + (usage premium), where usage premium = (premium parameter) x (cumulative net transfers from the CFC) x absolute value(unemployment deviation), if unemployment deviation < 0 (that is, below its moving average).

CONCLUSIONS

53. A CFC could provide substantial macroeconomic stabilization, while at the same time entailing modest contributions and risk reduction. This Note considers how a CFC can be designed to balance economic principles and political constraints. First, even with relatively modest annual contributions, a CFC could provide meaningful stabilization in a downturn. Second, making transfers conditional on strict compliance with the EU fiscal rules would help address moral hazard risks emanating from fiscal risk sharing. Third, several design options are available to prevent permanent transfers between countries.

54. A CFC would strengthen the euro area’s resilience to shocks and provide substantial benefits to all countries. A CFC would strengthen the currency union’s ability to achieve a balanced policy mix in response to a shock and would provide critical policy space in the event that monetary policy is constrained. It would require all countries to build buffers in good times and provide a common safety net for bad times, expanding the stabilization tools available to all countries in a downturn. A CFC could reduce the likelihood of future crises and, when they occur, make them less severe and less prone to spillover.

55. A number of issues would have to be looked into before a CFC could be agreed upon. Our proposal balances fiscal risk sharing with risk reduction, but as emphasized throughout this SDN, there are several ways to achieve this balance. Further work would be required to ensure that the mechanism and its calibration sufficiently address the concerns of the various stakeholders. Even then, the political challenges of reaching an agreement on the technical features of the mechanism should not be underestimated. Streamlining and simplifying the fiscal rules would help ensure a transparent and automatic link between risk sharing and compliance with fiscal rules, but it would require strong political will to achieve such a comprehensive reform. Also, this Note has not addressed essential issues such as the institutional setup and governance arrangements of the CFC.

56. Now would be a good time to take the first steps to establish a CFC. The expansionary phase of the cycle is the best time to introduce a CFC, especially if assets must be built up through contributions before activating transfers. Considerable political hurdles remain in the path of more fiscal integration and the window of opportunity created by support from political leaders could be short. Policymakers should seize this chance to strengthen the euro area’s resilience.

References

- Aiyar, Shekhar, Wolfgang Bergthaler, Jose M. Garrido, Anna Ilyina, Andreas Jobst, Kenneth Kang, Dmitriy Kovtun, Yan Liu, Dermot Monaghan, and Marina Moretti. 2015. "A Strategy for Resolving Europe's Problem Loans." IMF Staff Discussion Note 15/19, International Monetary Fund, Washington, DC.
- Allard, Celine, Petya Koeva Brooks, John C. Bluedorn, Fabian Bornhorst, Katherine Christopherson, Franziska Ohnsorge, Tigran Poghosyan, and an IMF Staff Team. 2013. "Toward a Fiscal Union for the Euro Area." IMF Staff Discussion Note 13/09, International Monetary Fund, Washington, DC.
- Andrle, Michal, John C. Bluedorn, Luc Eyraud, Tidiane Kinda, Petya Koeva Brooks, Gerd Schwartz, and Anke Weber. 2015a. "Reforming Fiscal Governance in the European Union." IMF Staff Discussion Note 15/09, International Monetary Fund, Washington, DC.
- Andrle, Michal, Patrick Blagrove, Pedro Espallat, Keiko Honjo, Benjamin Hunt, Mika Kortelainen, René Lalonde, Douglas Laxton, Elenora Mavroeidi, Dirk Muir, Susanna Mursula, and Stephen Snudden. 2015b. "The Flexible System of Global Models." IMF Working Paper 15/64, International Monetary Fund, Washington, DC.
- Bara, Yves-Emmanuel, Lucie Castets, Thomas Ernoult, and Adrien Zakhartchouk. 2017. "[A Contribution to Work on the Strengthening of the Euro Area](#)." Trésor-Economics 190, French Treasury, Paris.
- Beblavý, Miroslav, Daniel Gros, and Ilaria Maselli. 2015. "[Reinsurance of National Unemployment Benefit Schemes](#)." CEPS Working Document 401, Centre for European Policy, Brussels.
- Bénassy-Quéré, Agnès, Markus Brunnermeier, Henrik Enderlein, Emmanuel Farhi, Marcel Fratzscher, Clemens Fuest, Pierre-Olivier Gourinchas, Philippe Martin, Jean Pisani-Ferry, Hélène Rey, Isabel Schnabel, Nicolas Véron, Beatrice Weder di Mauro, and Jeromin Zettelmeyer. 2018. "[Reconciling Risk Sharing with Market Discipline: A Constructive Approach to Euro Area Reform](#)." CEPR Policy Insight 91, Center for Economic Policy Research, London.
- Berger, Helge, Giovanni Dell'Ariccia, and Maurice Obstfeld. 2018. "Revisiting the Case for a Fiscal Union in the Euro Area." Departmental Paper, IMF Research Department, International Monetary Fund, Washington, DC.
- Carnot, Nicolas, Phil Evans, Serena Fatica and Gilles Mourre, 2015, "Income Insurance: A Theoretical Exercise with Empirical Application for the Euro Area", European Commission Economic Papers 546, Brussels.

- Carnot, Nicolas, Magdalena Kizior, and Gilles Mourre. 2017. "[Fiscal Stabilization in the Euro Area: A Simulation Exercise](#)." CEB Working Paper 17/025, Centre Emile Bernheim, Solvay Brussels School of Economics and Management, Brussels.
- Constâncio, Vítor. 2017. "[Effectiveness of Monetary Union and the Capital Markets Union](#)." Speech at the Eurofi Conference, Malta, April 6.
- Dolls, Mathias, Clemens Fuest, Friedrich Heinemann, and Andreas Peichl. 2016. "[Reconciling Insurance with Market Discipline: A Blueprint for a European Fiscal Union](#)." CESifo Working Paper 5767, CESifo Group, Munich.
- Dolls, Mathias, Clemens Fuest, Dirk Neumann, and Andreas Peichl. 2015. "[An Unemployment Insurance Scheme for the Euro Area? A Comparison of Different Alternatives Using Micro Data](#)." CESifo Working Paper 5581, CESifo Group, Munich.
- Dullien, Sebastian. 2014a. *[A European Unemployment Benefit Scheme: How to Provide for More Stability in the Euro Zone](#)*. Verlag Bertelsmann Stiftung, Gütersloh.
- Dullien, Sebastian. 2014b. "[The Macroeconomic Stabilization Impact of a European Basic Unemployment Insurance Scheme](#)." *Intereconomics* 49 (4): 189–93.
- European Commission. 2012. "[A Blueprint for a Deep and Genuine Economic and Monetary Union](#)." Brussels.
- . 2016. "Cross-Border Risk Sharing after Asymmetric Shocks: Evidence from the Euro Area and the United States." *Quarterly Report on the Euro Area* 15 (2): 7–18.
- . 2017a. "[Reflection Paper on the Deepening of the Economic and Monetary Union](#)." Brussels.
- . 2017b. "[New Budgetary Instruments for a Stable Euro Area within the Union Framework](#)." Brussels.
- . 2017c. "[White Paper on the Future of Europe](#)." Brussels.
- European Parliament. 2016a. "[Draft Report on Budgetary Capacity for the Eurozone](#)." 2015/2344(INI), May 4, Brussels.
- . 2016b. "[A Fiscal Capacity for the Euro Area? Options for Reforms to Counter Asymmetric Shocks](#)." Brussels.
- Eyraud, Luc, and Tao Wu. 2015. "Playing by the Rules: Reforming Fiscal Governance in Europe." IMF Working Paper 15/67, International Monetary Fund, Washington, DC.
- Eyraud, Luc, Vitor Gaspar, and Tigran Poghosyan. 2017. "Fiscal Politics in the Euro Area." IMF Working Paper 17/18, International Monetary Fund, Washington, DC.

- Furceri, Davide, and Aleksandra Zdzienicka. 2015. "The Euro Area Crisis: Need for a Supranational Fiscal Risk Sharing Mechanism?" *Open Economies Review* 26 (4): 683–710.
- Gaspar, Vitor. 2016. "Designing a Central Fiscal Capacity in the Euro Area." Presentation to the Informal Ecofin, Bratislava, September 10.
- Gaspar, Vitor, Maurice Obstfeld, and Ratna Sahay. 2016. "Macroeconomic Management when Policy Space Is Constrained: A Comprehensive, Consistent, and Coordinated Approach to Economic Policy." IMF Staff Discussion Note 16/09, International Monetary Fund, Washington, DC.
- Giannone, Domenico, Michele Lenza, and Lucrezia Reichlin. 2009. "[Business Cycles in the Euro Area](#)." ECB Working Paper 1010, European Central Bank, Frankfurt.
- Goyal, Rishi, Petya Koeva Brooks, Mahmood Pradhan, Thierry Tresselt, Giovanni Dell'Ariccia, Ross Leckow, Celya Pazarbasioglu, and an IMF Staff Team. 2013. "A Banking Union for the Euro Area." IMF Staff Discussion Note 13/01, International Monetary Fund, Washington, DC.
- International Monetary Fund. 2014. "Fiscal Governance in the Euro Area: Progress and Challenges," In *Euro Area Policies, Selected Issues*. IMF Country Report 14/199, International Monetary Fund, Washington, DC.
- . 2016. "Options for a Central Fiscal Capacity in the Euro Area." In *Euro Area Policies, Selected Issues*. IMF Country Report 16/220, International Monetary Fund, Washington, DC.
- Italian Ministry of Finance. 2017. "[Italian Contribution on Deepening the EMU](#)." Rome.
- Juncker, Jean-Claude (in close cooperation with Donald Tusk, Jeroen Dijsselbloem, Mario Draghi, and Martin Schulz). 2015. "[The Five Presidents' Report: Completing Europe's Economic and Monetary Union](#)." European Commission, Brussels.
- Macron, Emmanuel. 2017. "[Initiative for Europe: A Sovereign, United, Democratic Europe](#)." Speech at the Sorbonne, Paris, September 26.
- Poghosyan, Tigran. 2017. "Cross-Country Spillovers of Fiscal Consolidations in the Euro Area." IMF Working Paper 17/140, International Monetary Fund, Washington, DC.
- Tereanu, Eugen, Anita Tuladhar, and Alejandro Simone. 2014. "Structural Balance Targeting and Output Gap Uncertainty." IMF Working Paper 14/107, International Monetary Fund, Washington, DC.
- Van Rompuy, Herman (in close collaboration with Jose Manuel Barroso, Jean-Claude Juncker, and Mario Draghi). 2012. "[The Four Presidents' Report: Towards a Genuine Economic and Monetary Union](#)." European Council, Brussels.

IMF STAFF DISCUSSION NOTE

A Central Fiscal Stabilization Capacity for the Euro Area: Technical Appendix

Nathaniel Arnold, Bergljot Barkbu, Elif Ture,
Hou Wang, and Jiaxiong Yao

DISCLAIMER: Staff Discussion Notes (SDNs) showcase policy-related analysis and research being developed by IMF staff members and are published to elicit comments and to encourage debate. The views expressed in Staff Discussion Notes are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

**A Central Fiscal Stabilization Capacity for the Euro Area
TECHNICAL APPENDIX**

Prepared by Nathaniel Arnold, Bergljot Barkbu, Elif Ture, Hou Wang, and Jiaxiong Yao¹

Authorized for distribution by Poul M. Thomsen and Vitor Gaspar

DISCLAIMER: Staff Discussion Notes (SDNs) showcase policy-related analysis and research being developed by IMF staff members and are published to elicit comments and to encourage debate. The views expressed in Staff Discussion Notes are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

JEL Classification Numbers: E62, F45, H87

Keywords: Euro Area, Fiscal Integration, Macroeconomic
Stabilization

Authors' E-mail Address: narnold@imf.org; bbarkbu@imf.org; hture@imf.org;
hwang2@imf.org; jyao@imf.org

¹ This technical appendix was produced under the guidance of Adrienne Cheasty, Mahmood Pradhan, Cathy Pattillo, and Shekhar Aiyar. Douglas Laxton and Susanna Mursula kindly helped with the EUROMOD simulations. Jesse Siminitz, Younghun Kim, and Samuel Romero Martinez provided excellent research assistance.

CONTENTS

A CENTRAL FISCAL STABILIZATION CAPACITY FOR EURO AREA: TECHNICAL APPENDIX	4
A. Selection of the CFC Trigger	4
B. General Equilibrium Model Simulations	7
C. Calculations Based on Historical Data	12
BOXES	
1. Technical Details of the CFC Mechanism	8
2. Shock Scenario Details	9
FIGURES	
1. Gross Transfers with Real Time vs. Ex-Post Data for Different Triggers	5
2. Output Gap vs. the Unemployment Rate Deviation from Trend	6
3. Shock Scenarios—Output and Inflation Impact	11
4. Shock Scenarios—CFC Assets	12
5. Shock Scenarios for Select Countries	12
6. Smaller Shock Scenarios—Output Impact	13
7. Country-Specific Shock Scenario	13
8. Cumulative Net Transfers from the CFC Under Different Triggers	18
9. Annual Gross Transfers from the CFC Under Different Triggers	19
10. Annual Gross Transfers from the CFC Under Different Triggers	20
11. Cumulative Net Transfers from the CFC Under Different Triggers	21
12. Cumulative Net Transfers from the CFC Under Different Contribution Sizes	22
13. Cumulative Net Transfers from the CFC Under Different Transfer Sizes	23
14. Cumulative Net Transfers from the CFC Under Different Start Dates	24
15. Total Annual Contributions to the CFC Under Different Usage Premia	25
16. Cumulative Net Transfers from the CFC Under Different Usage Premia	26
17. Cumulative Net Transfers from the CFC when Contributions are Capped	27
REFERENCES	28

A CENTRAL FISCAL STABILIZATION CAPACITY FOR THE EURO AREA: TECHNICAL APPENDIX

1. This technical appendix accompanies the Staff Discussion Note (SDN/XX/XX) that proposes a central fiscal capacity (CFC) for macroeconomic stabilization for the euro area. It provides additional material on the selection of the CFC trigger, model simulations, and calculations using the historical data.

A. Selection of the CFC Trigger

2. This section presents additional analysis for selecting the deviation of the unemployment rate from its 7-year moving average as trigger for CFC transfers.

3. The unemployment rate is a better cyclical indicator to use as a CFC trigger than the real GDP growth rate, because it is subject to smaller ex-post revisions. The text table shows that revisions to quarterly real GDP growth (computed year on year) and the quarterly unemployment rate for the four largest euro area countries are both around 0.3 percentage points on average. But, relative to the mean for the two variables, the revisions to GDP growth are much larger (about 20 percent on average) than they are for the unemployment rate (less than 5 percent on average).

Real GDP Growth and Unemployment Rate Revisions					
	Germany	France	Italy ¹	Spain	Avg. for EA4
Revision (percentage points)					
RGDP Growth	0.26	0.36	0.27	0.30	0.30
Unemployment Rate	0.35	0.24	0.11	0.54	0.31
Mean (percent)					
RGDP growth	1.23	1.09	1.49	1.40	1.31
Unemployment Rate	7.43	9.10	9.12	15.97	10.40
Revision/Mean					
RGDP Growth	0.21	0.33	0.18	0.21	0.23
Unemployment Rate	0.05	0.03	0.01	0.03	0.03

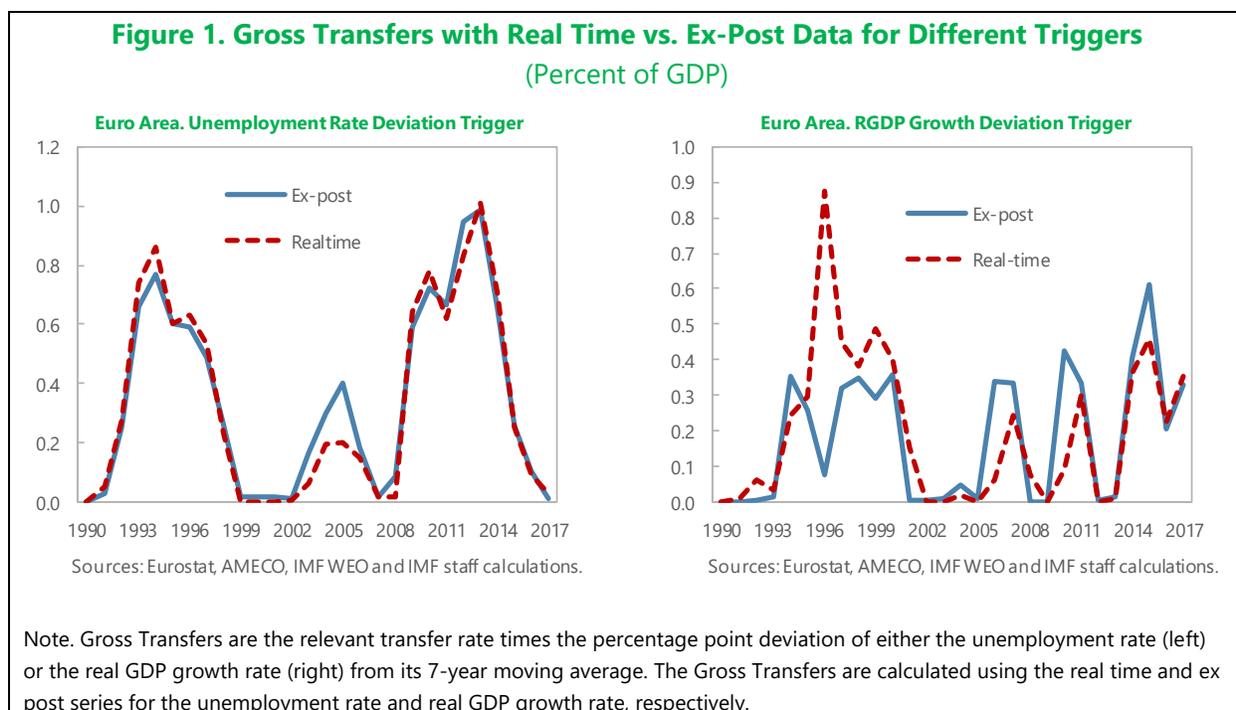
Sources: OECD and Fund staff calculations

Notes: Revisions are measured as the average of the absolute values of revisions after 8 quarters for quarterly RGDP growth (y/y) and the quarterly unemployment rate. RGDP growth (unemployment rate) revisions and means calculated using data for 2002Q1-2017Q1 (2000Q1-2017Q2).

¹ For Italy mean growth is from 1999-2007 because for 2002Q1-2017Q1 it is nearly 0. Also, the extent of revisions to Italy's unemployment rate may be understated due to timing differences in reporting unemployment.

4. The unemployment rate is clearly a better trigger for the CFC transfers (Figure 1). Because GDP growth is subject to larger revisions than the unemployment rate, using real GDP growth deviations as a trigger would cause the CFC to make more transfers in real time that it would not have made were the ex post (and presumably more accurate) data available. This is confirmed by calculations of CFC transfers using both real time and ex post data for real GDP growth and the unemployment rate.¹ We can see that the transfers calculated using the real time and ex post unemployment rate data are much closer than those calculated using the real GDP growth data.

¹ We would like to thank the authors of Carnot and others (2017) for sharing their data with us. The real-time data is from different vintages of AMECO, while the ex post data is just the most recent vintage of the series available.



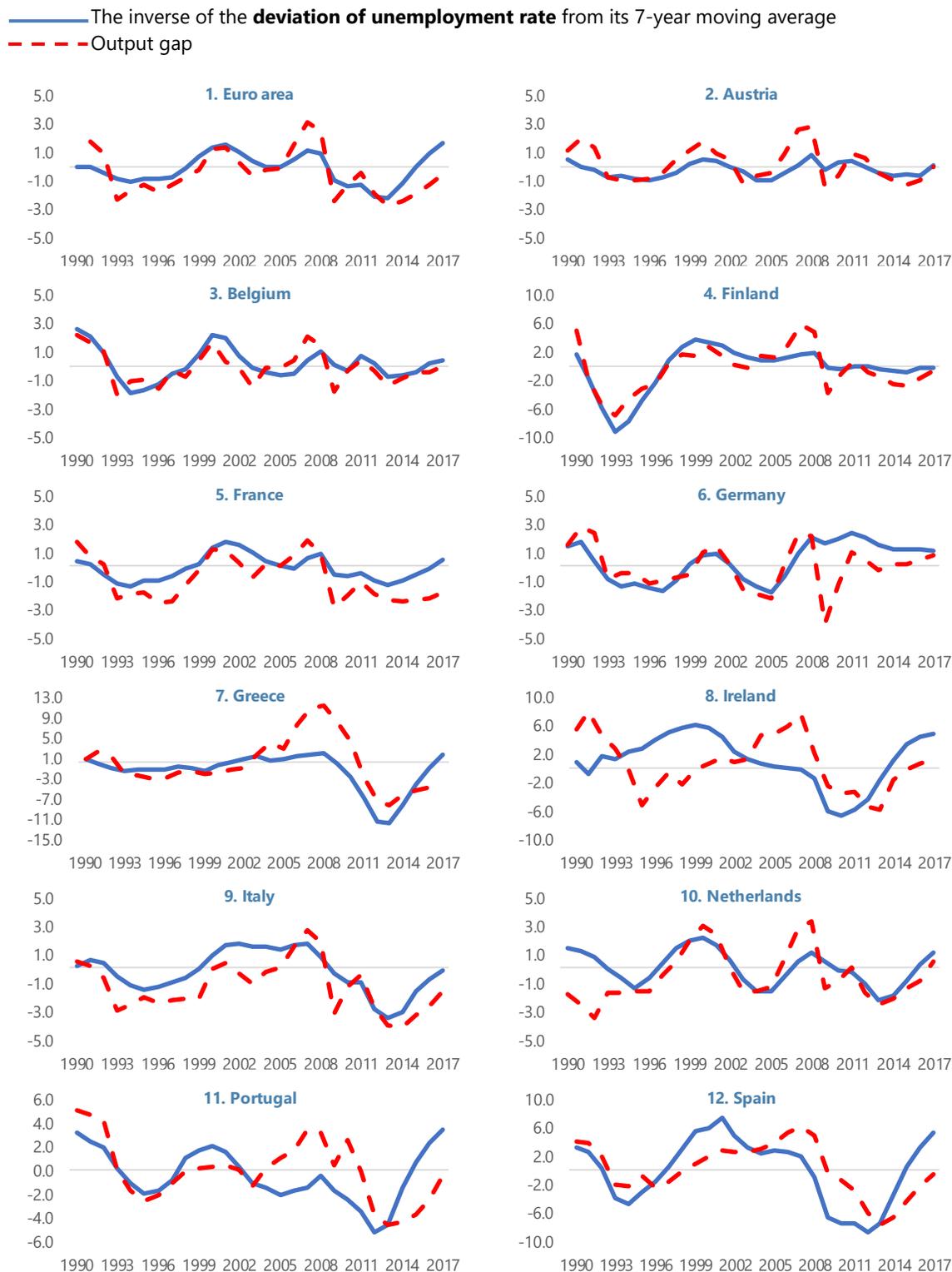
5. The deviation in the unemployment rate from its 7-year moving average is a reasonable proxy for the output gap. Figure 2 shows that, the inverse of the deviation of the unemployment rate from its 7-year moving average is highly correlated with the (ex post) estimated output gap in most euro area countries. For the euro area as a whole, the correlation coefficient is 0.7 for the period 1990 to 2017 (Figure 2.1).² Using a 10-year moving average to compute the trend unemployment rate would yield a higher correlation with the output gap for the euro area—with a coefficient of 0.8. However, using a longer moving average period increases the risk of providing transfers for structural increases in unemployment rather than due to cyclical fluctuations. Based on data from the Centre for Economic Policy Research Business Cycle Dating Committee, the average length of a business cycle in the euro area is around 8 years.³ Similarly, ECB research finds that euro area cycles range from 6 to 9 years.⁴

² Using the deviation of the real GDP growth rate instead of the unemployment rate from its long-run moving average yields a much lower contemporaneous correlation with the estimated output gap for the euro area as a whole, with a coefficient of 0.1–0.2 for the period 1990–2017 when using 5–10 years to compute the moving average. Real GDP growth rate deviation from trend is highly *negatively* correlated with the *lagged* output gap (with a coefficient of about 0.7 when using the 5-year moving average as trend), reflecting the fact that real GDP growth rates pick-up after the trough of a cycle, well before the output gap and the unemployment gap are closed.

³ Data is available at <https://cepr.org/content/euro-area-business-cycle-dating-committee>

⁴ See Domenico Giannone, Michele Lenza and Lucrezia Reichlin (2009), Business Cycles in the Euro Area, ECB Working Paper Series No. 1010.

Figure 2. Output Gap vs. the Unemployment Rate Deviation from Trend
(Percent of GDP)



Source: IMF WEO Database and IMF staff calculations.

B. General Equilibrium Model Simulations

6. This section presents the simulations to assess the stabilization properties of the CFC using *illustrative* area-wide and country-specific shocks.

7. Simulations are conducted using the IMF's EUROMOD model. EUROMOD is one of the versions of the Flexible System of Global Models (FSGM). These models are forward-looking, semi-structural global general equilibrium models containing 24 countries/regions, which for EUROMOD includes the 11 largest individual euro area countries plus a block for the rest of the euro area and 12 other countries/regions (for details, see Andrieu and others, 2015). These simulations illustrate how a CFC could help stabilize output when a shock happens, but cannot show how the CFC behaves over a full cycle, let alone several cycles.

8. The CFC builds up assets through contributions prior to a shock, which it uses to fund transfers in response to the shock. Countries pay contributions of 0.35 percent of GDP by raising the labor income tax rate, which in the scenarios with the CFC causes a small reduction in real GDP (relative to the steady state) before the shock. Over the 5 years before the shock, these contributions generate assets of 1.8 percent of GDP. Box 1 contains the details of the CFC mechanism we simulate.

9. In the *illustrative* area-wide shock scenario, a private demand shock in all countries is compounded by a risk premium shock in some of them, and exacerbated by procyclical fiscal consolidation (see Box 2). The first component of the shock hits real private investment and consumption. Countries with higher debt levels also experience a risk premium shock. All countries then engage in a procyclical fiscal tightening, cutting government consumption and investment, with countries cutting more the higher their public debt ratio.

10. During the euro area crisis, there were significant differences across countries in terms of borrowing costs and fiscal adjustment, which we try to approximate in the simulations. The countries are assigned to one of three groups based on their government debt levels in 2017, which determines the severity of the shock they face. The countries are grouped into "low", "medium", and "high" debt groups. Countries in the low group do not receive a risk premium shock and do about 60 percent of the fiscal adjustment that countries in the medium debt group do. The medium debt group implements spending cuts worth about 2½ percent of baseline GDP over years t+1 to t+3 and receive a risk premium shock in t+1 which diminishes over time. Countries in the high debt group do twice as much fiscal adjustment as the "medium" debt group and experience a larger risk premium shock. This pattern is roughly consistent with what was seen during the euro area crisis.

Box 1. Technical Details of the CFC Mechanism

All variables are in percent of GDP. The aggregate CFC contribution target is defined by:

$$C_t^* = \frac{A_t^*(\pi_t \gamma^{ss} - 1)}{\pi_t \gamma^{ss}}$$

where A_t^* is the steady state CFC asset target and π_t, γ^{ss} are gross inflation and the real GDP growth rate in the steady state, respectively. Given the calibration of the model and an aggregate contribution target of 0.35 percent of euro area GDP per year, this implies the steady state CFC assets target A_t^* is 10 percent of euro area GDP

Actual (primary, excluding interest earned on CFC assets) CFC contributions for each country i in every period t are calculated as follows:

$$C_{i,t} = (C_{i,t}^* + \lambda^c \min(u_{i,t}^{gap}, 0) \max(NT_{i,t}, 0)) - I_{i,t}$$

where $u_{i,t}^{gap}$ is the unemployment rate deviation from its 7-year moving average and $NT_{i,t}$ is the cumulative amount of net transfers (sum of transfers minus contributions over time) country i has received from the CFC up to period t , and $I_{i,t}$ is the country's share of the interest earned on CFC assets if it is a net contributor. The second term on the right-hand side is the "usage premium" that helps prevent permanent transfers. Currently in the model $\lambda^c = 0.01$, which means if the unemployment rate falls 1 percentage point below its moving average and the country has received net transfers from the CFC of 1 percent of its GDP, the contribution will rise by 0.01 percent of GDP for this country in period t . Hence, if a country accesses the CFC in bad times, once the economy recovers, the size of the contributions will rise.

With i_{t-1}^{DEU} denoting the German short-term interest rate, total interest earned on the CFC's assets (or paid on borrowing) is defined as:

$$I_t = \frac{i_{t-1}^{DEU} A_{t-1}}{\pi_t \gamma^{ss}}$$

The CFC assets evolve according to the following equation:

$$A_t = \frac{A_{t-1}}{\pi_t \gamma^{ss}} + C_t - T_t + I_t$$

where C_t is the sum of contributions from all countries and T_t is the sum of the transfers made by the CFC in period t .

The transfers from the CFC to country i is determined by the transfer rate parameter λ^u and the size of the unemployment rate deviation (in percentage points) if it is positive, as calculated by:

$$T_{i,t} = \lambda^u \max(u_{i,t}^{gap}, 0)$$

In the baseline case we set $\lambda^u = 1$, which approximates the effects of a transfer parameter of 0.5 percent of GDP per 1 percentage point deviation of unemployment from the moving average when analyzing the CFC using historical data.

Box 2. Shock Scenario Details

The shock scenario is illustrative, but inspired by the recent euro area crisis. There are three parts to the shock: (i) a hit to private sector demand, (ii) a risk premium shock for countries with higher public debt levels, and (iii) a procyclical fiscal adjustment, which depends on public debt levels as well.

The 11 euro area countries we model are split into three groups based on their general government debt levels in 2017. The low debt group have debt below 85 percent of GDP (Austria, Finland, Germany, Ireland, Netherlands). The medium debt group have debt between 85 and 120 percent of GDP (Belgium, France, Spain). The high debt group have debt above 120 percent of GDP (Greece, Italy, Portugal).

The private demand component of the shock is proportionally the same in all the countries, but the other shock components differ across countries depending on which group they are in (see below). Countries in the low debt group do not suffer a risk premium shock and do the least procyclical fiscal adjustment. The medium debt group of countries have a smaller risk premium shock and implement an intermediate amount spending cuts. Countries in the high debt group suffer a larger risk premium shock and do more fiscal adjustment than the other countries.

The **private sector demand shock** reduces real private investment by 3 percent over t+1 to t+3. Since private investment is correlated with private consumption, there is an implicit shock to consumption as well.

The **risk premium shock** applied to the medium group of countries increases the sovereign risk premium by 100 basis points (bps) and the corporate risk premium by an additional 50 bps in t+1. It then decays back towards zero, such that the shock is reduced by half after 2 years. For the high debt group of countries, the size of the shock is doubled (i.e. increase sovereign risk premium by 200 bps and corporate risk premium by an additional 100 bps). Consistent with the argument in the SDN that the CFC reduces the likelihood of spikes in sovereign borrowing costs, for the case with the CFC, there is no risk premium shock for the medium debt group of countries and the sovereign risk premium shock for the high debt countries is reduced to around 30 bps (plus an additional 15 bps shock to corporate risk premium).

The size of the **procyclical fiscal consolidation shock** for each group of countries is calibrated to be similar to the fiscal tightening of different groups of countries during the euro area crisis in 2011–12.

The table below illustrates how the cuts to government consumption ($\bar{\epsilon}^{GC}$) and investment ($\bar{\epsilon}^{GI}$) evolve. The cuts increase from the initial shock period t+1 to the trough at t+3 before being partly unwound in t+5.

Fiscal Consolidation Shock Profile					
	t+1	t+2	t+3	t+4	t+5
Government Consumption	$\frac{1}{3}\bar{\epsilon}^{GC}$	$\frac{2}{3}\bar{\epsilon}^{GC}$	$\bar{\epsilon}^{GC}$	$\bar{\epsilon}^{GC}$	$\frac{1}{2}\bar{\epsilon}^{GC}$
Government Investment	$\frac{1}{3}\bar{\epsilon}^{GI}$	$\frac{2}{3}\bar{\epsilon}^{GI}$	$\bar{\epsilon}^{GI}$	$\bar{\epsilon}^{GI}$	$\frac{1}{2}\bar{\epsilon}^{GI}$

Note: The size of the cuts at the trough differ across country groups.

For the low debt group, the size of the cuts at the trough are $\bar{\epsilon}^{GC} = -0.96$ and $\bar{\epsilon}^{GI} = -0.45$ percentage points of baseline GDP. This is 60 percent of the size of the cuts made by the medium debt group.

For the medium debt group, the size of the cuts at the trough are $\bar{\epsilon}^{GC} = -1.6$ and $\bar{\epsilon}^{GI} = -0.75$ percentage points of baseline GDP, which is the same as the euro area aggregate.

For the high debt group, the size of the cuts at the trough are $\bar{\epsilon}^{GC} = -3.2$ and $\bar{\epsilon}^{GI} = -1.5$ percentage points of baseline GDP—twice the size of the cuts made by the medium debt group.

11. We examine the shock when monetary policy is unconstrained and when it is constrained at the effective lower bound (ELB). This helps to understand how fiscal policy with the CFC and monetary policy interact. In addition, monetary policy is more likely to end up at the ELB for some time after it begins normalizing, so it's important to understand the degree to which the CFC can help fiscal policy stabilize the economy when monetary policy is unable to do so. When monetary policy is constrained, we assume the policy rate is fixed at zero over the simulation period.

12. The CFC provides significant smoothing of the shock, especially when monetary policy is constrained. The upper panels in Figure 3 illustrate the impact of the shock on output for the euro area as a whole when monetary policy is free to respond (upper left) and when monetary policy is constrained (upper right). The lower panels show the behavior of inflation in the respective scenarios. Monetary policy clearly plays a substantial stabilizing role, with an output gap trough of around 2½ percentage points of euro area GDP below the baseline when monetary policy can respond compared to around 6 percent when it is constrained (red lines). However, the CFC provides meaningful smoothing (blue lines), reducing the shock's output impact by about one-third when monetary policy responds and by about three-fifths when it does not. The CFC also improves inflation outcomes by supporting a better macroeconomic policy mix, reducing the risk of a "debt-deflation" spiral.⁵

13. While the CFC does not quite exhaust its assets in our main calibration, varying the transfer parameter shows that it needs a borrowing capacity. Figure 4 illustrates how the CFC's assets behave in the different scenarios. For our CFC proposal, when monetary policy is unconstrained, the transfers use only a modest portion of the assets (left panel, blue line). We can also see that, by coincidence, the assets built up before the shock are just enough to cover the prescribed transfers when the shock hits and monetary policy is constrained (right panel, blue line). However, an additional simulation with a higher transfer parameter shows that to provide more smoothing (or to deal with larger shocks) the CFC would need a borrowing capacity.

14. Looking at results for individual countries shows the CFC also helps prevent divergences between countries when shocks hit. Figure 5 illustrates the output impact on Germany (low debt group), France (medium debt group), and Italy (high debt group) of the shock scenario without a CFC (left panel) and with our proposed CFC (right panel) when monetary policy is constrained. Without a CFC, at the trough the output gap for Italy (red dashed line) is more than 4 percentage points lower than for Germany (blue dashed line), in part because of the additional risk premia shock Italy experiences and the greater fiscal adjustment. With the CFC (right panel), not only is the shock impact smaller for each country, but the difference between the output gaps for Italy and Germany is cut nearly in half—to around 2 percentage points. Compared to the case without the CFC, the more modest difference in the shock impact for France (black line) and Germany is also reduced with the CFC.

⁵ Note that the fiscal multipliers in the model are endogenous and are effectively larger when monetary policy is constrained because interest rate cuts do not mitigate some of the impact of fiscal tightening.

15. We also simulate a smaller version of the area-wide shock scenario. In this scenario the shock elements are the same as the main scenario described in Box 2, but only 1/3 the size. The dynamics are similar to the results discussed above. As Figure 6 shows, when monetary policy is unconstrained, the CFC smooths about 30 percent of the shock, while it smooths about half the shock impact when monetary policy is at the ELB. This suggests the CFC would still be useful even in more typical recessions.

16. To explore the functioning of the CFC in the case of a country-specific shock, we simulate a scenario where only Spain suffers a shock like the one described above. Specifically, Spain experiences the private demand shock, along with the intermediate risk premium and procyclical fiscal adjustment shocks described in Box 2. Even though euro area monetary policy is unconstrained, it does not respond much to the country-specific shock. Hence, there is a greater need for fiscal policy support, which the CFC helps provide, smoothing a bit less than half of the shock, as seen in Figure 7 (left panel). We can also see that transfers to even a relatively large euro area country does not make much of dent in the level of assets held by the CFC (right panel).

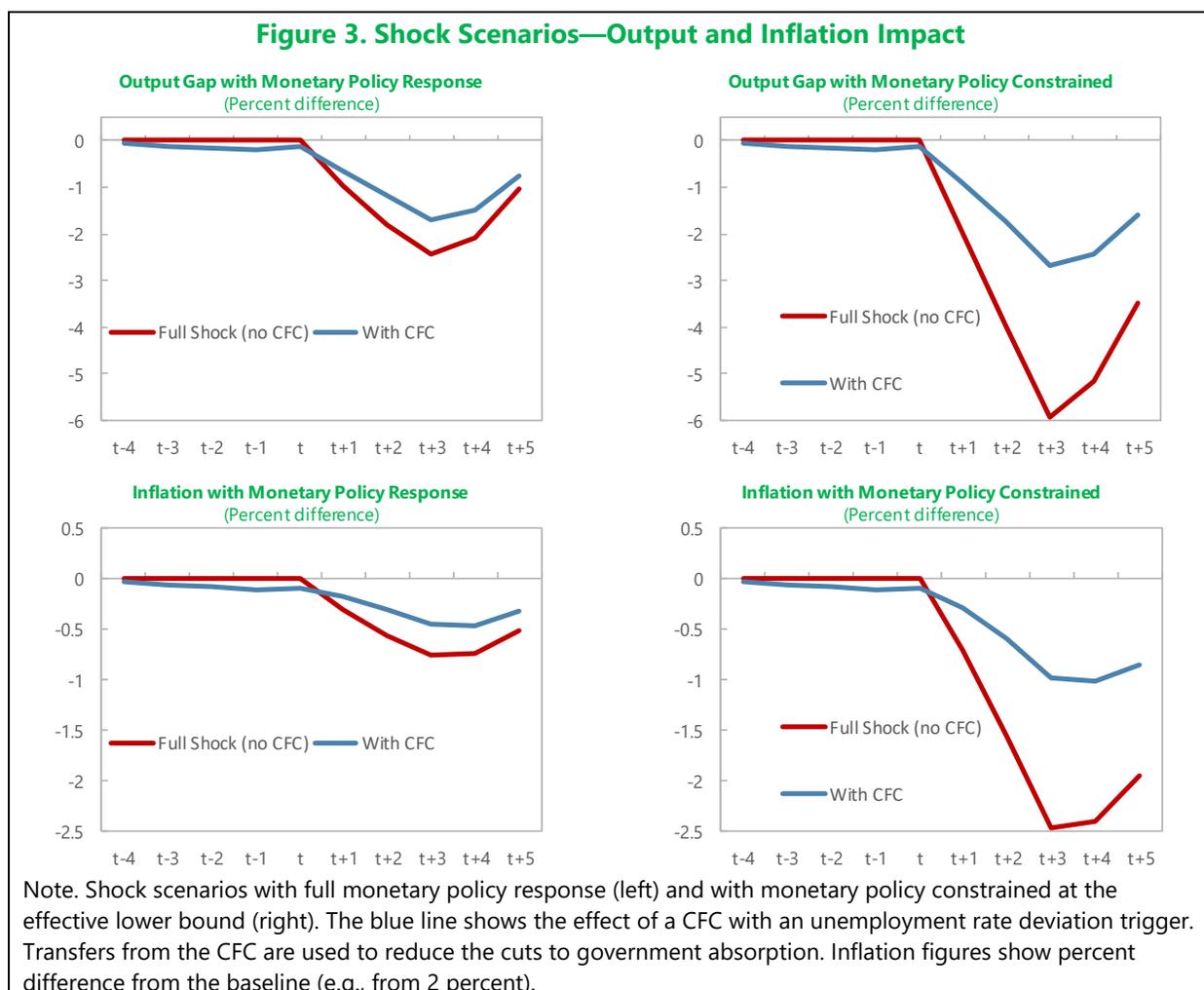


Figure 4. Shock Scenarios—CFC Assets

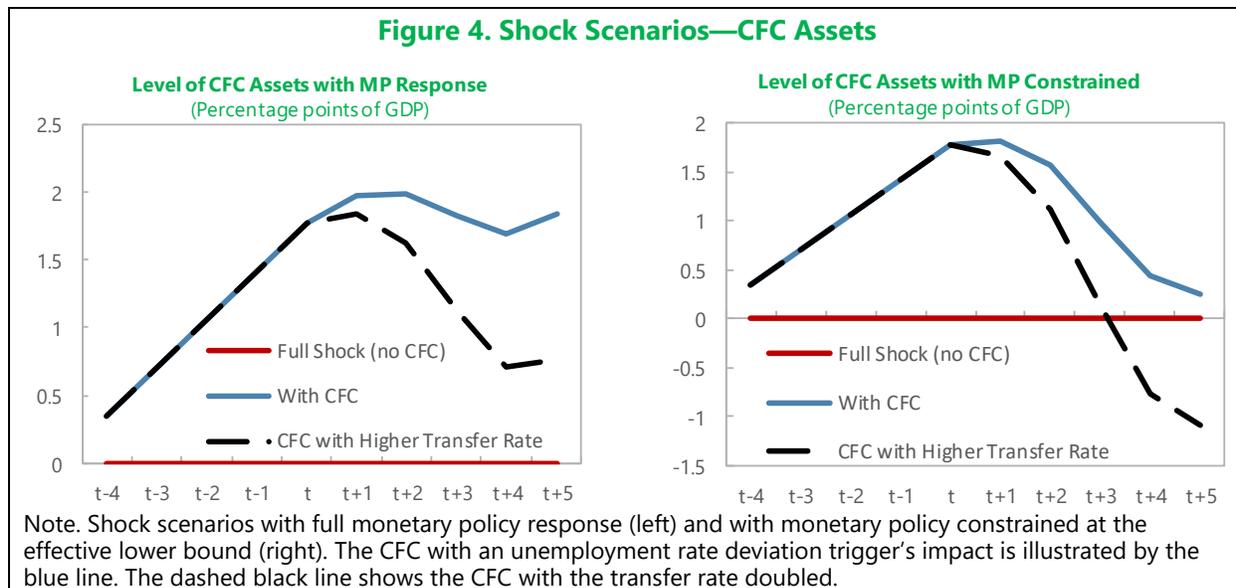


Figure 5. Shock Scenarios for Select Countries

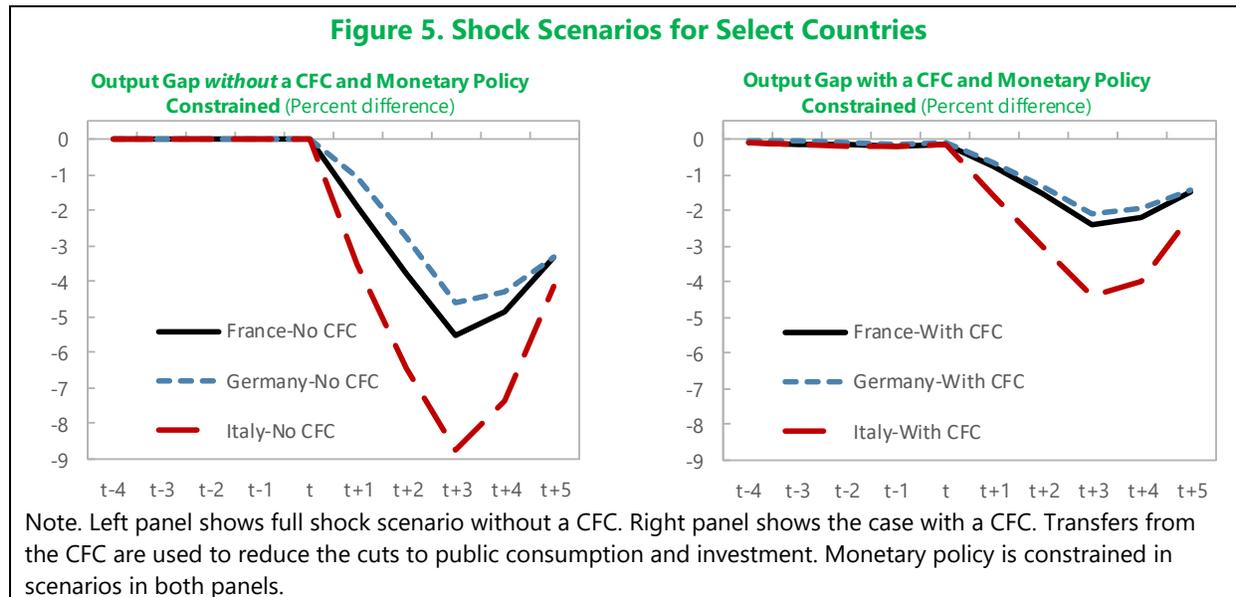


Figure 6. Smaller Shock Scenarios—Output Impact

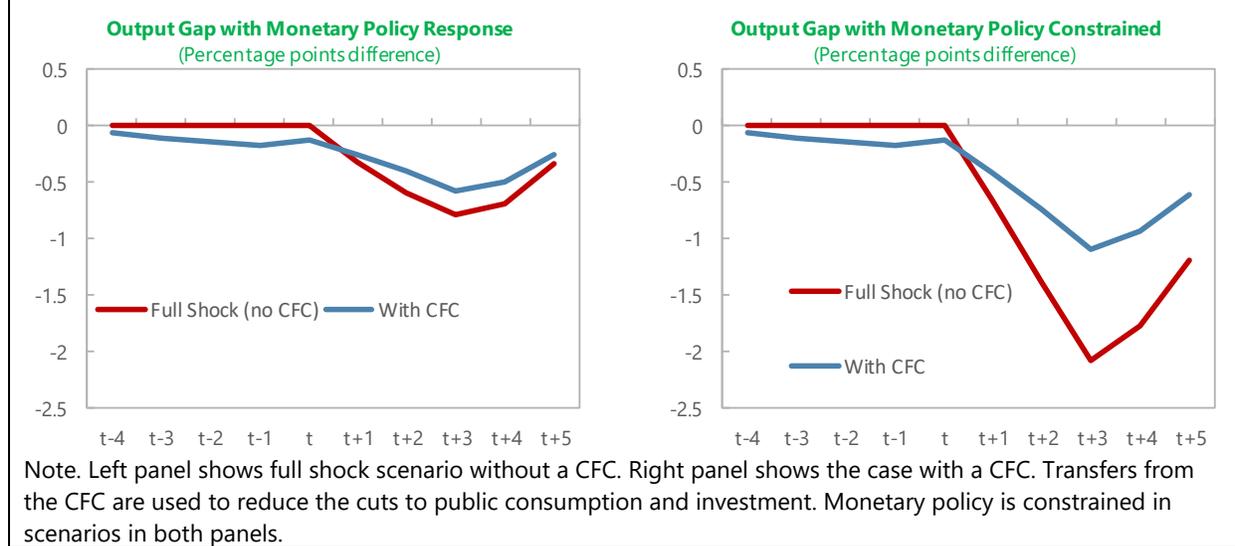
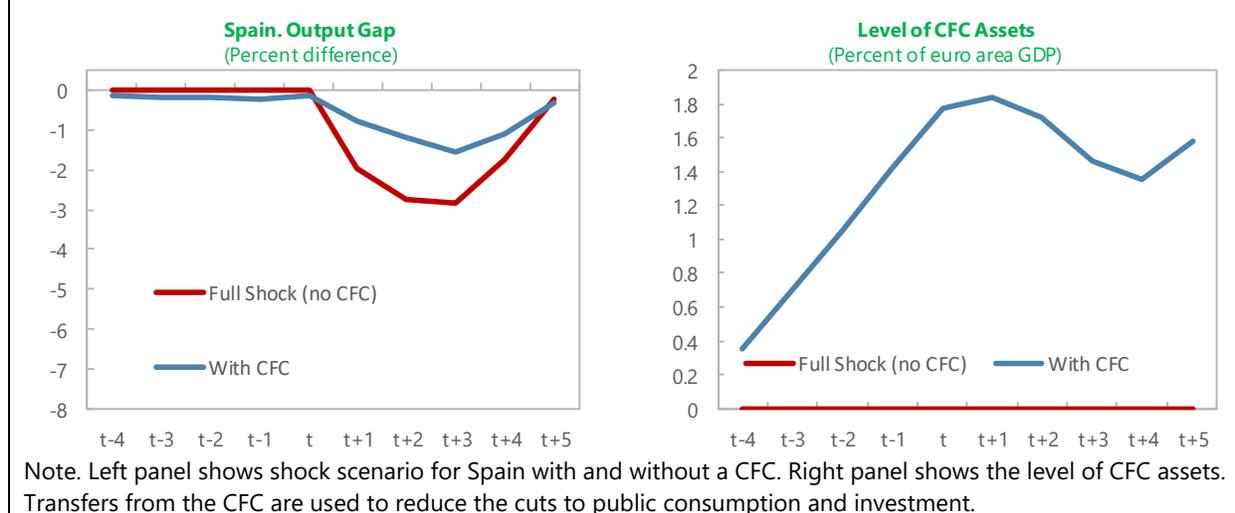


Figure 7. Country-Specific Shock Scenario



C. Calculations Based on Historical Data

17. This section presents the calculations based on historical data to calibrate the CFC and examine its behavior over a long period of time and under different assumptions. This exercise uses annual “ex-post” data on unemployment rate, nominal and real GDP, and output gap from the IMF’s WEO database from 1980 to 2017, and covers the 19 economies currently in the euro area.⁶ It

⁶ For brevity, the calculations are presented for the 11 largest economies in the euro area, accounting for 97 percent of euro area GDP, and the euro area as a whole, as the GDP weighted sums or averages from the 19 euro area countries. Projections for the unemployment rate from the WEO Database for the period 2018–22 are also used in some calculations.

(continued)

computes the hypothetical contributions to and transfers from the CFC over the past economic cycles, had a CFC been in place since the 1990s. It helps quantify the accumulation of funds in the CFC and the distribution of these funds across countries over the macroeconomic cycle and under different assumptions regarding the design and calibration of the CFC.⁷

18. Calculations under baseline assumptions show that modest annual contributions would be sufficient to finance a sizeable stabilization capacity. The baseline assumes: i) the CFC starts operating in 1990, ii) each country pays regular annual contributions to the CFC of 0.35 percent of GDP, iii) transfers to a country are triggered by the deviation of unemployment rate from its 7-year moving average, iv) countries receive transfers of 0.5 percent of GDP for every 1 percentage point deviation, and v) a borrowing capacity is available to the CFC. Under the baseline:⁸

- The CFC would have accumulated around 1 percent of euro area GDP in assets before the recession in the early 1990s (which would be sufficient to finance the required transfers in 1993–94, but would be exhausted by 1995 (Figure 8.1, blue line). The borrowing capacity would have been utilized from 1995–2000. Similarly, the CFC would have built up assets of over 1½ percent of GDP before the global financial crisis, then exhausted those assets in 2012, relying on the borrowing capacity from 2013. The total CFC borrowing would have peaked at 1.1 percent of euro area GDP in 2014.
- The aggregate annual *gross* transfers from the CFC would peak at around 1.1 percent of euro area GDP in 2013 (Figure 9.1,).⁹ While aggregate gross transfers would average almost 0.4 percent of euro area GDP per year, the maximum annual gross transfer to an individual country would be 6 percent of that country’s GDP, made to in Greece in 2013 (Figure 9.7). All countries would get net transfers in some years (the difference between the colored lines and grey lines in Figure 9), reflecting their unemployment rate being sufficiently above its moving average.¹⁰
- Maximum cumulative net transfers to a single country would amount to around 20 percent of GDP (Greece in 2009–16, Spain in 2008–15), and maximum cumulative net contributions from a single country would reach 6 percent of GDP (Ireland in 2007) (Figure 8). While the net asset position of the fund would fluctuate around zero symmetrically between 1990 to 2017 (Figure 8.1), some countries would stand out as net contributors (Austria, Netherlands) and net

⁷ Note that these calculations based on past data are only a rough approximation of the transfers that would have occurred had a CFC actually been in place in the past. In particular, such calculations do not reflect that many countries’ fiscal policies during past downturns would have been less procyclical with a CFC, dampening the cyclical fluctuations, and in turn the size of CFC transfers.

⁸ Note that in Figures 8–17 below, the blue line always represents the baseline assumptions.

⁹ The annual *net* transfers are computed as the annual gross transfers minus contributions (Figure 9, gray line).

¹⁰ Under the baseline, a country receives positive net annual transfers (gross annual transfers minus contributions), when the unemployment rate exceeds its trend by over 0.7 percentage point (i.e., $0.5 \times (u - \bar{u}) > 0.35$ when $(u - \bar{u}) > 0.7$, where u denotes the unemployment rate and \bar{u} denotes its long-run moving average.)

beneficiaries (Finland) of the fund over time (Figure 8). Of course, this in part depends on when the CFC begins, as discussed below.

19. Baseline assumptions are modified to examine how different features affect the behavior of the CFC, particularly for certain countries. In particular, we examine how i) the specification of the trigger, ii) the size of the contributions and transfers, iii) the start year of the CFC, and iv) mechanisms to avoid permanent transfers would affect the buildup of funds in the CFC and the distribution of these funds across countries over the economic cycle.

20. The specification of the trigger—in particular, the measure of the deviation of unemployment rate from its trend—would affect whether a country would be a net contributor or a net beneficiary of the fund. In particular, all else equal, using the percent instead of percentage point deviation of unemployment rate from its 7-year moving average to compute the transfer schedule¹¹ would result in i) higher gross transfers to those countries with structurally lower and less volatile unemployment rates, such as Austria and the Netherlands, and ii) lower gross transfers to countries with structurally higher and more volatile unemployment rates, such as Greece and Spain (Figure 9). In this case, Austria and the Netherlands would switch from being net contributors to net beneficiaries of the fund, and the net cumulative transfers to Greece and Spain would fall significantly compared to the baseline (Figure 8). While this would mitigate the risk of permanent transfers across some countries, it would come at a cost of lower accumulated assets in the fund, and earlier and higher resort to the borrowing capacity (Figure 8.1). One implication of this is that if countries implement structural reforms that change the average level and volatility of unemployment, it could have implications for the timing and size of transfers they receive.

21. The choice of the trigger—in particular, the period over which the trend unemployment rate is calculated—would affect the size and duration of the transfers provided.

- All else equal, using a longer period over which the unemployment rate moving average is calculated would result in higher gross transfers to most countries and for longer periods (Figure 10). Moreover, this would result in higher and longer periods of CFC borrowing (Figure 11.1).
- Using a 5-year moving average, which follows the actual unemployment rate more closely, would provide insufficient stabilization, as gross transfers would be reduced (or net transfers would be cut) to countries with still sizeable output gaps (Figure 11). As discussed in Section A, using a 10-year moving average, on the other hand, would lead to higher gross transfers that could be unwarranted by cyclical conditions and instead reflect structural changes, as evidenced by the prolonged gross transfers to countries following severe economic crises (Figure 10).

¹¹ Under this schedule, countries would receive gross transfers of 0.5 percent of GDP for every 10 percent deviation of unemployment rate from its trend (i.e., $0.05 \times (u - \bar{u}) / \bar{u}$).

Using a 7-year moving average appears to achieve a reasonable balance between these two concerns.

22. The sizes of the contributions and transfers should be calibrated simultaneously taking into consideration the desired build up in assets and the stabilization capacity.

- Too small a contribution size, amounting to 0.1 percent of GDP per year, would result in the CFC always needing to borrow to finance the prescribed transfers, making most countries net beneficiaries throughout the simulation period (Figure 12.1). Similarly, too large a contribution size, for instance over 0.5 percent of GDP per year, would lead to excessive accumulation of assets, even during the GFC, and several permanent net contributors.
- If transfers are too small, on the other hand, amounting to $\frac{1}{4}$ percent of GDP per 1 percentage point deviation in the unemployment rate, the fund would always accumulate assets (Figure 13.1). Too small a transfer size would also provide insufficient stabilization to the economies (see Section B). Conversely, transfers over $\frac{3}{4}$ percent of GDP per unemployment rate deviation, while providing greater stabilization, may result in the CFC needing to perpetually borrow.

23. When the CFC begins collecting contributions and making transfers also matters for the build-up of assets in the CFC. Whether a CFC becomes operational during an upturn or a downturn, or builds assets for some time before starting to make transfers, affects the net cumulative contributions to the fund, and in turn its net asset position. Figure 14 illustrates that had a CFC been in place since the inception of the euro in 1999 (hence it would not have been borrowing following the 1992–93 recession), it would have accumulated more in assets before the GFC, amounting to over 2 percent of euro area GDP (instead of $1\frac{1}{2}$ percent of GDP if the CFC started in 1990), which would be exhausted one year later, in 2013, compared with the baseline. In this scenario, the CFC would switch from borrowing to accumulating assets in 2017, net cumulative transfers to Austria and the Netherlands (Spain) would be higher, and Spain would be lower, and Finland would switch from being a net beneficiary to a net contributor of the fund.¹²

24. Different price and quantity mechanisms, in particular usage premia and bonuses, as well as caps on contributions or transfers, could help prevent permanent transfers.

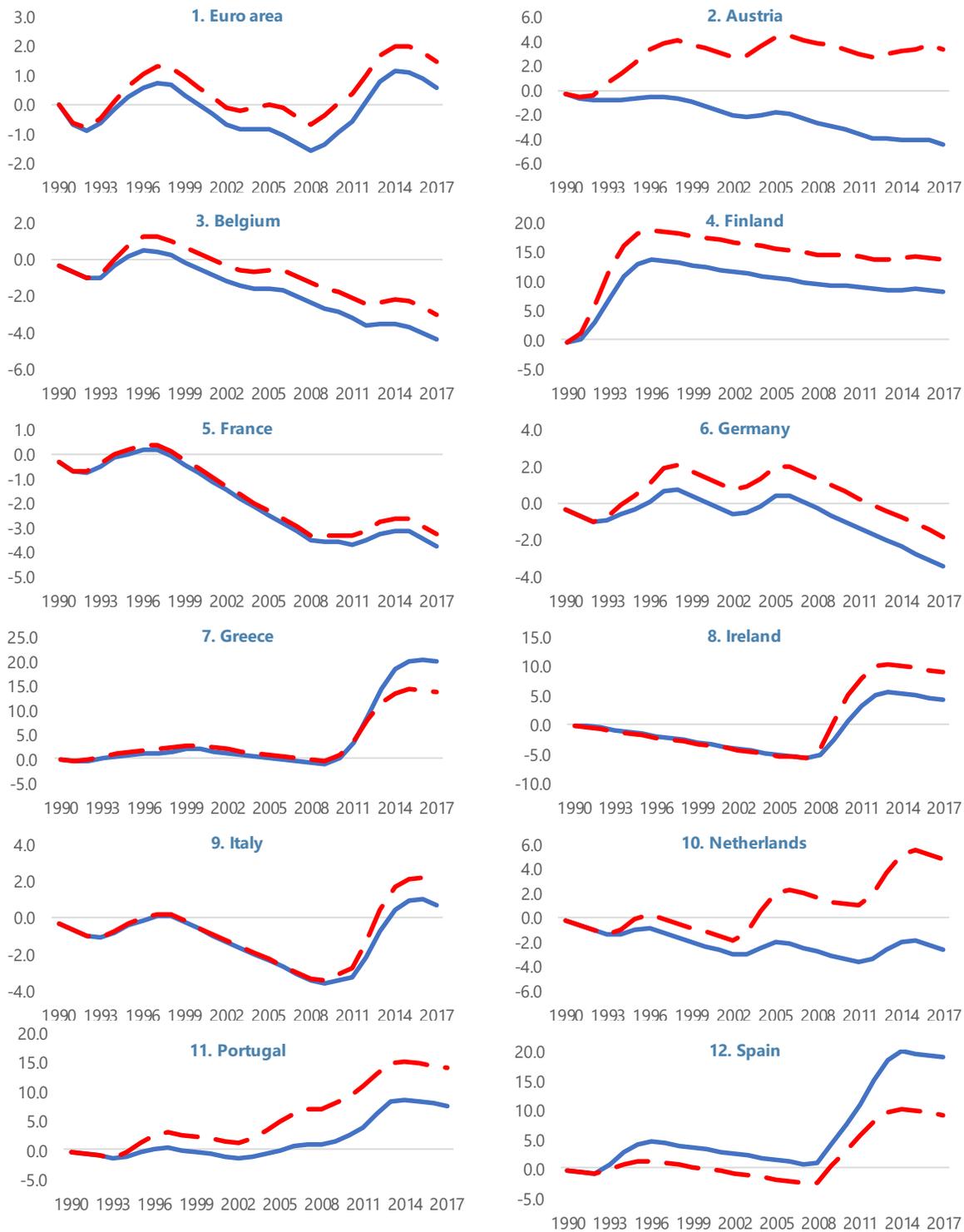
- Requiring countries to pay additional contributions once the deviation of the unemployment rate from its moving average becomes negative (i.e., the economy has recovered), proportional to the past cumulative transfers that they received and the relative strength of the cyclical recovery (e.g., payments equivalent to 1 percent of the net cumulative transfers per 1 percentage point of decline in the unemployment rate below its moving average), would result in a faster build-up of assets in the fund in the aftermath of the GFC (Figure 16.1).

¹² Finland experienced a sharp rise in unemployment rate in the first half of the 1990s, which would not have been covered by the CFC, had it started in 1999 instead of 1990.

- With usage premia as defined above, net beneficiaries like Finland, Greece, Portugal, and Spain, would contribute in total $\frac{1}{2}$ to $1\frac{1}{2}$ percent of GDP per year to the fund for a few years when their economies have recovered (Figure 15), after receiving about 10 to 20 percent of GDP in net cumulative transfers when their economies have busted (Figure 16). Putting a cap on cumulative transfers could be considered to limit the excessive use of funds, hence the payments of such large usage premia.
- Alternatively, putting a cap on net cumulative contributions to the CFC, for instance at 2 percent of GDP, would limit the extent of potential one-way transfers from countries with very long periods of favorable unemployment dynamics and less/fewer sizeable shocks, as is the case for Austria, France and the Netherlands in the baseline scenario (Figure 17).

Figure 8. Cumulative Net Transfers from the CFC Under Different Triggers
(Percent of GDP)

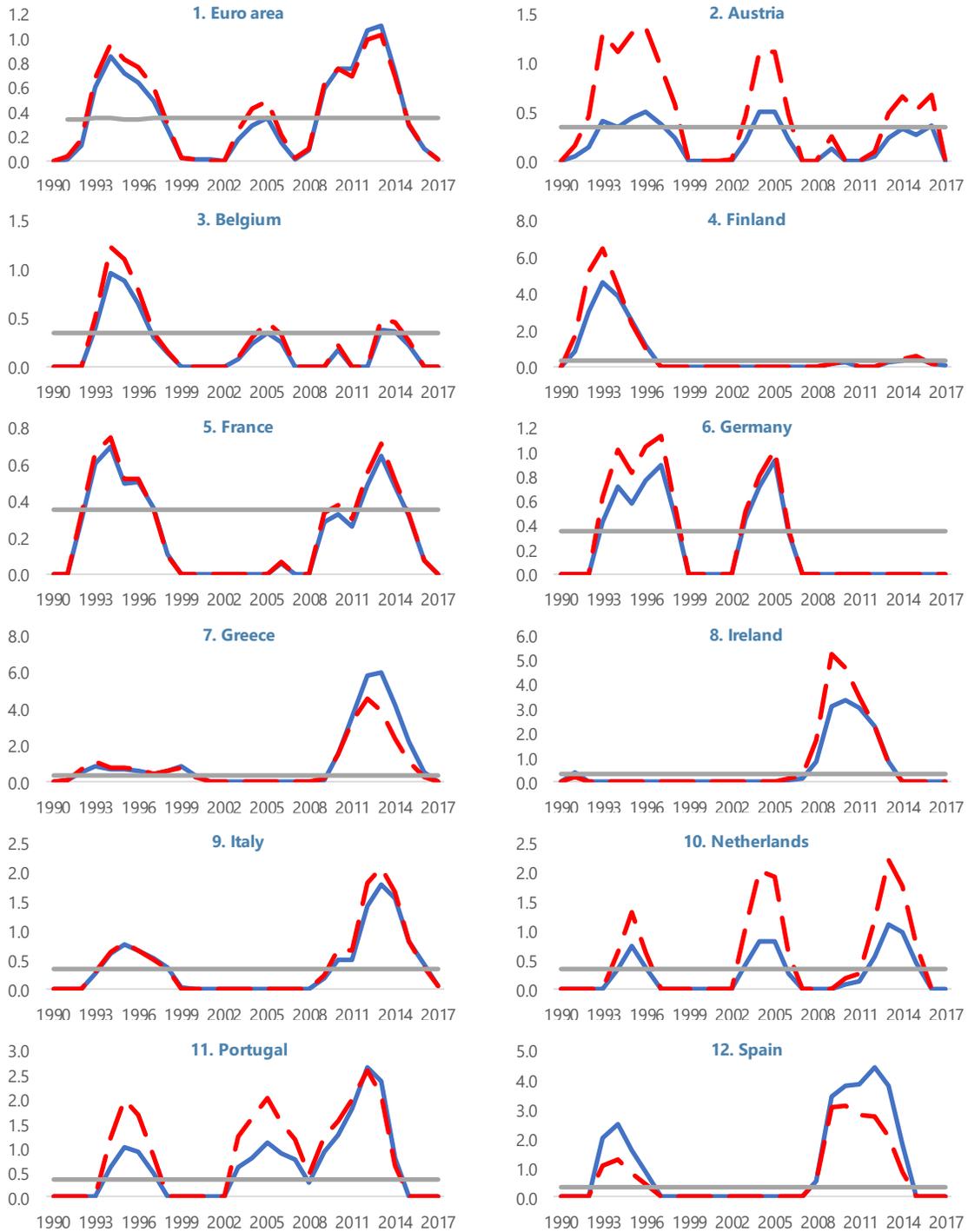
— Using **percentage point** deviation of unemployment rate from its 7-year moving average as trigger
 - - - Using **percent** deviation of unemployment rate from its 7-year moving average as trigger



Source: IMF WEO Database and IMF staff calculations.

Figure 9. Annual Gross Transfers from the CFC Under Different Triggers
(Percent of GDP)

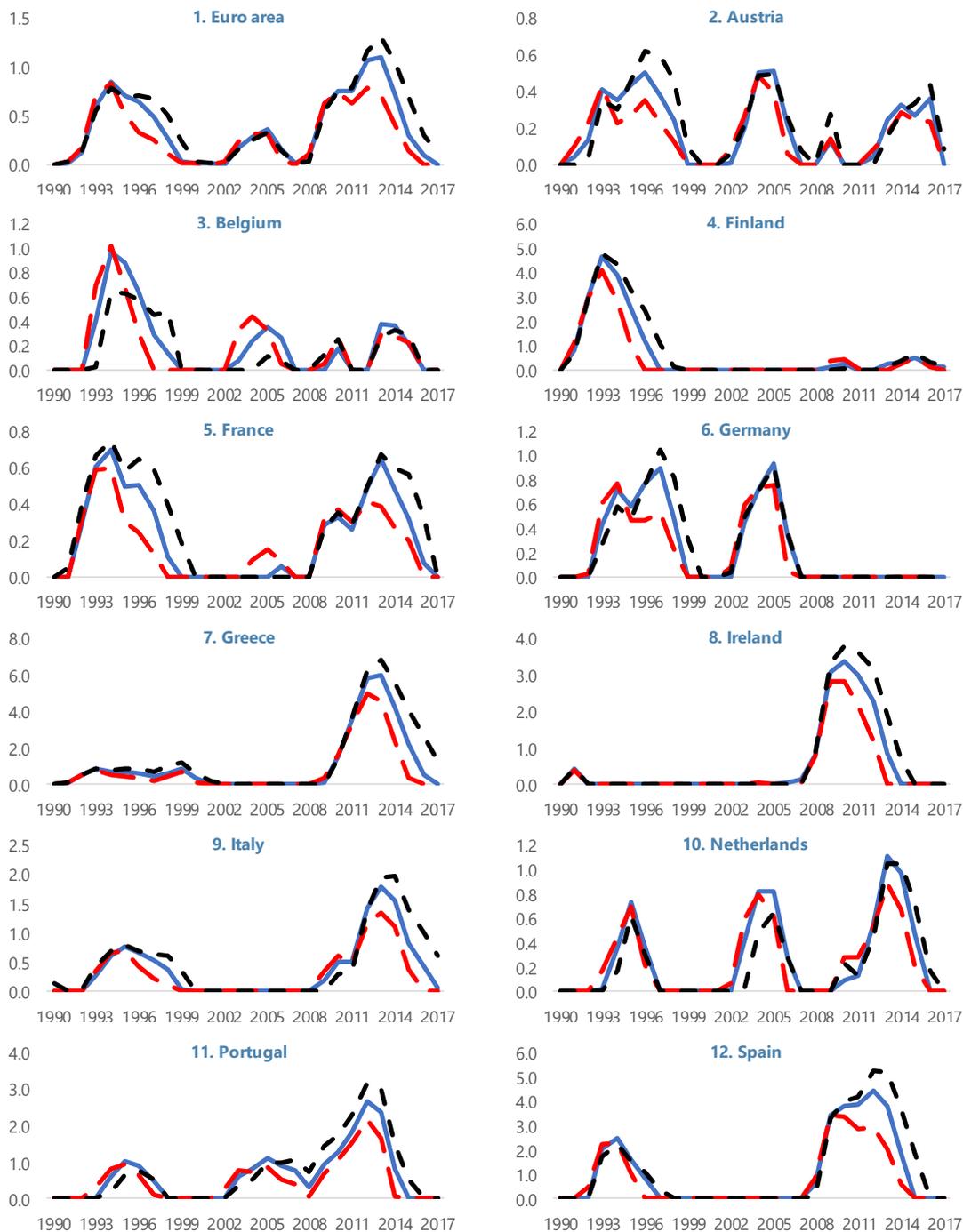
- Using **percentage point** deviation of unemployment rate from its 7-year moving average as trigger
- - - Using **percent** deviation of unemployment rate from its 7-year moving average as trigger
- Annual contribution size of 0.35 percent of GDP



Source: IMF WEO Database and IMF staff calculations.

Figure 10. Annual Gross Transfers from the CFC Under Different Triggers
(Percent of GDP)

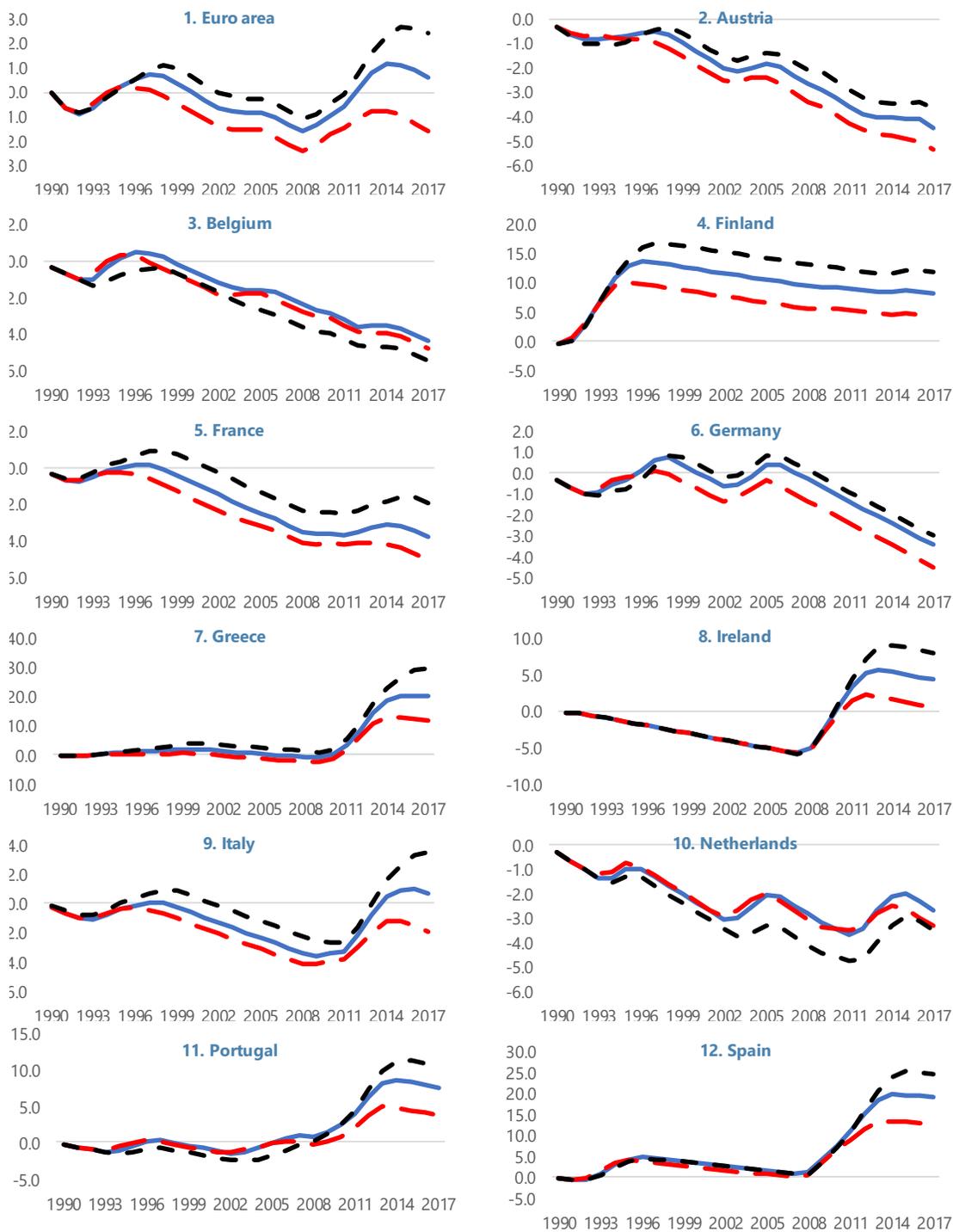
- - - Using percentage point deviation of unemployment rate from its **5-year moving average** as trigger
- Using percentage point deviation of unemployment rate from its **7-year moving average** as trigger
- - - Using percentage point deviation of unemployment rate from its **10-year moving average** as trigger



Source: IMF WEO Database and IMF staff calculations.

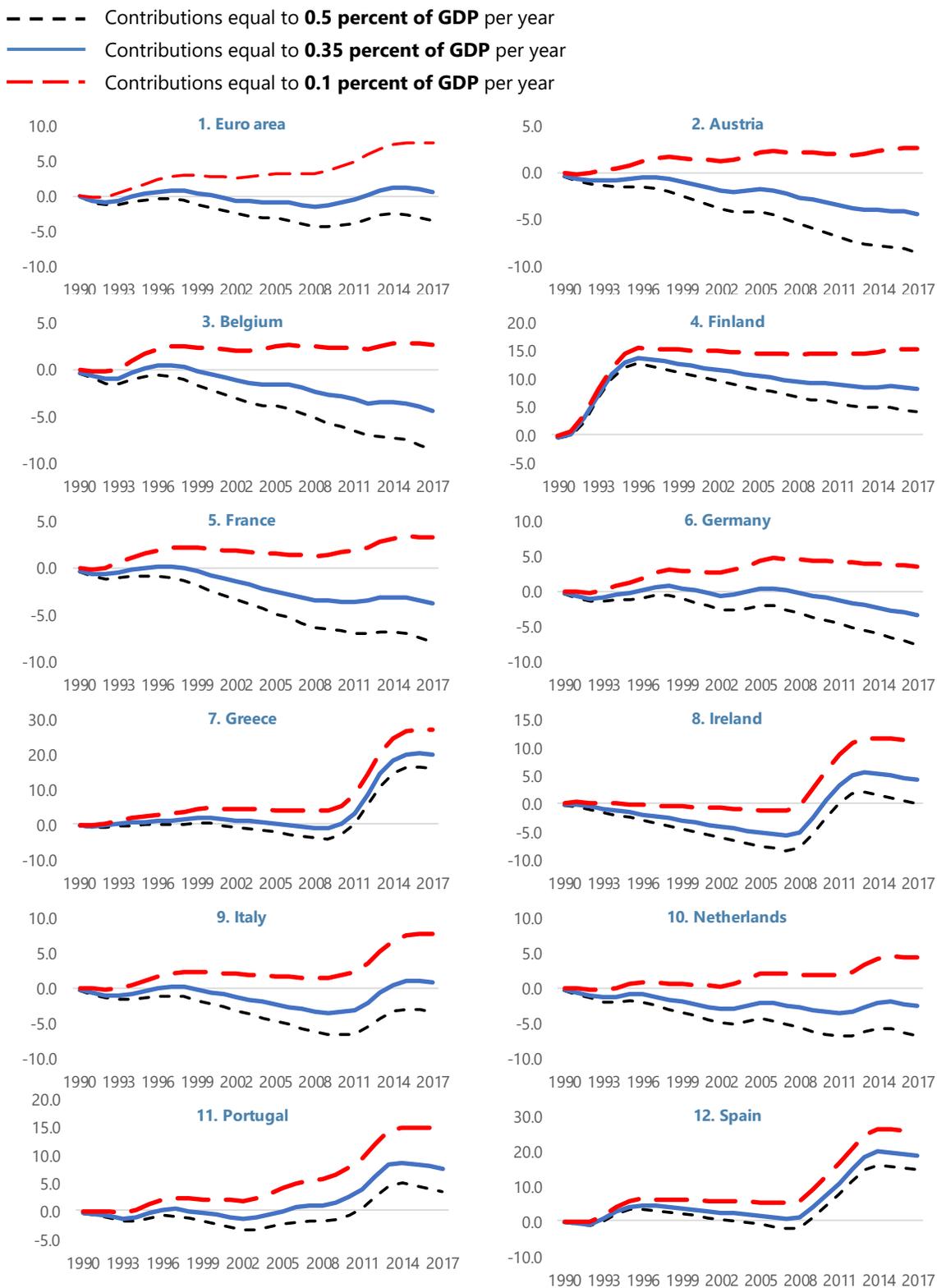
Figure 11. Cumulative Net Transfers from the CFC Under Different Triggers
(Percent of GDP)

- — — Using **percentage point** deviation of unemployment rate from its **5-year moving average** as trigger
- — — Using **percentage point** deviation of unemployment rate from its **7-year moving average** as trigger
- — — Using **percentage point** deviation of unemployment rate from its **10-year moving average** as trigger



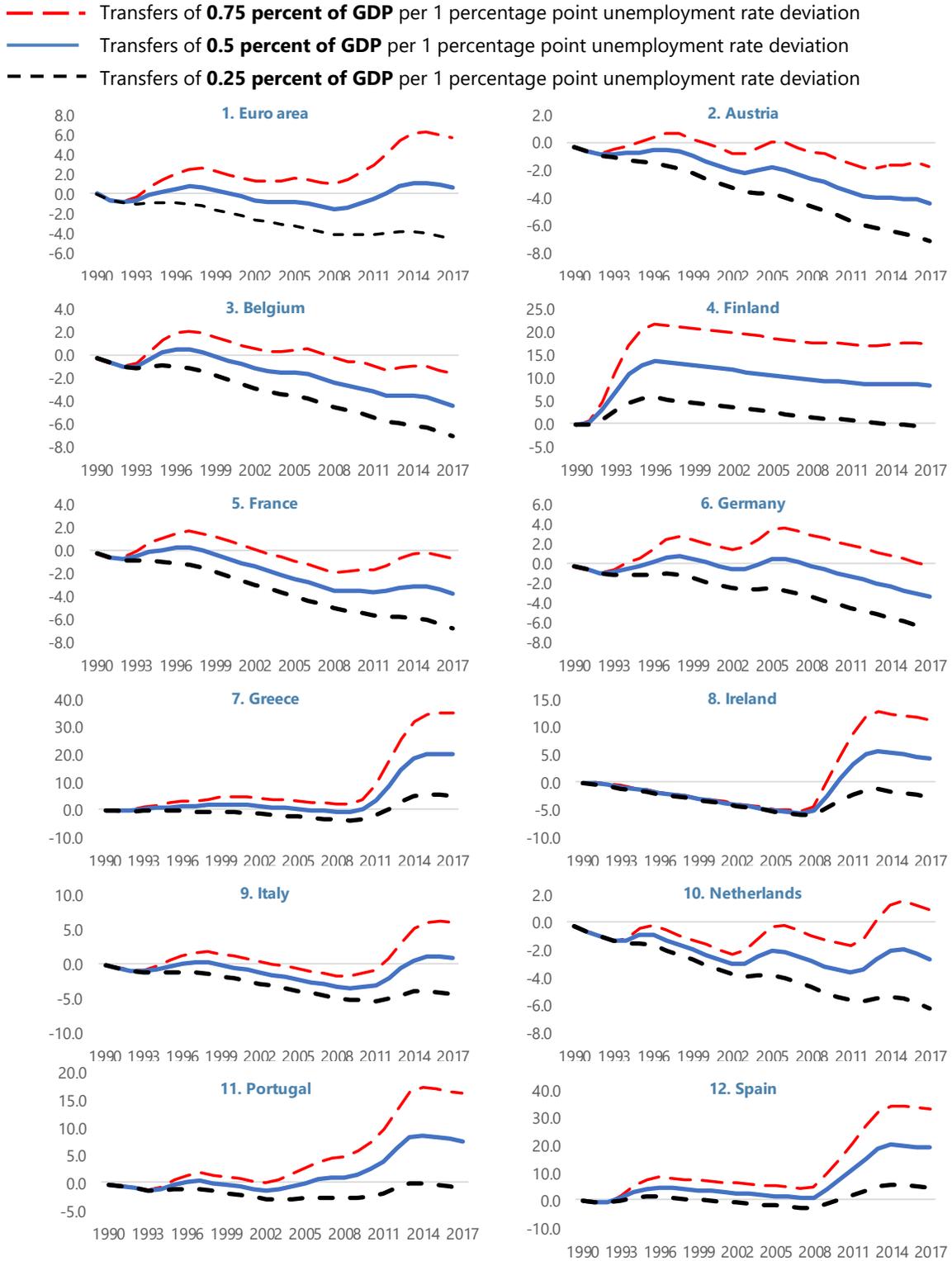
Source: IMF WEO Database and IMF staff calculations.

Figure 12. Cumulative Net Transfers from the CFC Under Different Contribution Sizes
(Percent of GDP)



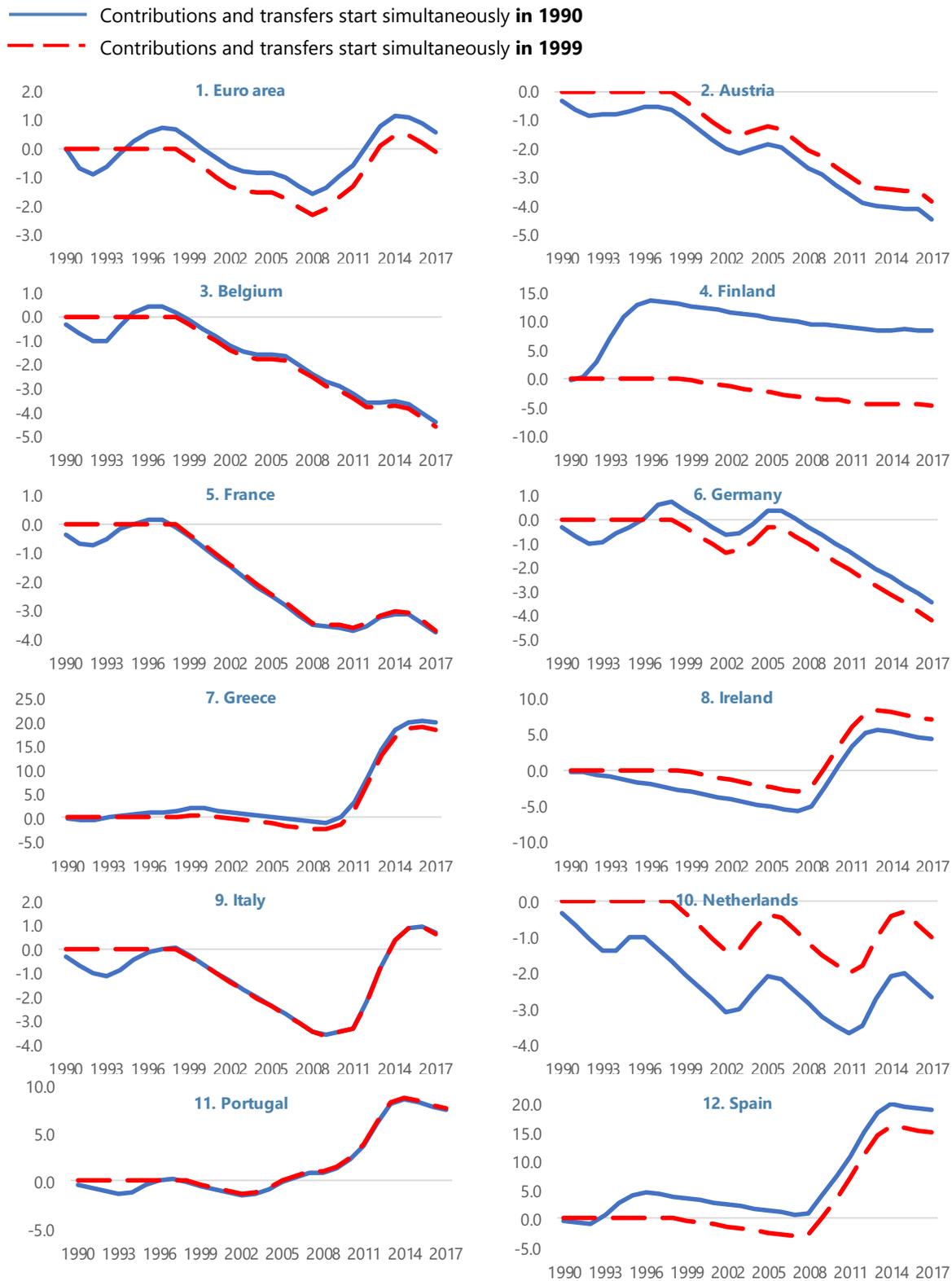
Source: IMF WEO Database and IMF staff calculations.

Figure 13. Cumulative Net Transfers from the CFC Under Different Transfer Sizes
(Percent of GDP)



Source: IMF WEO Database and IMF staff calculations.

Figure 14. Cumulative Net Transfers from the CFC Under Different Start Dates
(Percent of GDP)



Source: IMF WEO Database and IMF staff calculations.

Figure 15. Total Annual Contributions to the CFC Under Different Usage Premia
(Percent of GDP)

— **No usage premium**
 - - **Usage premium of 1 percent** on cumulative net transfers per 1 ppt unemployment rate deviation

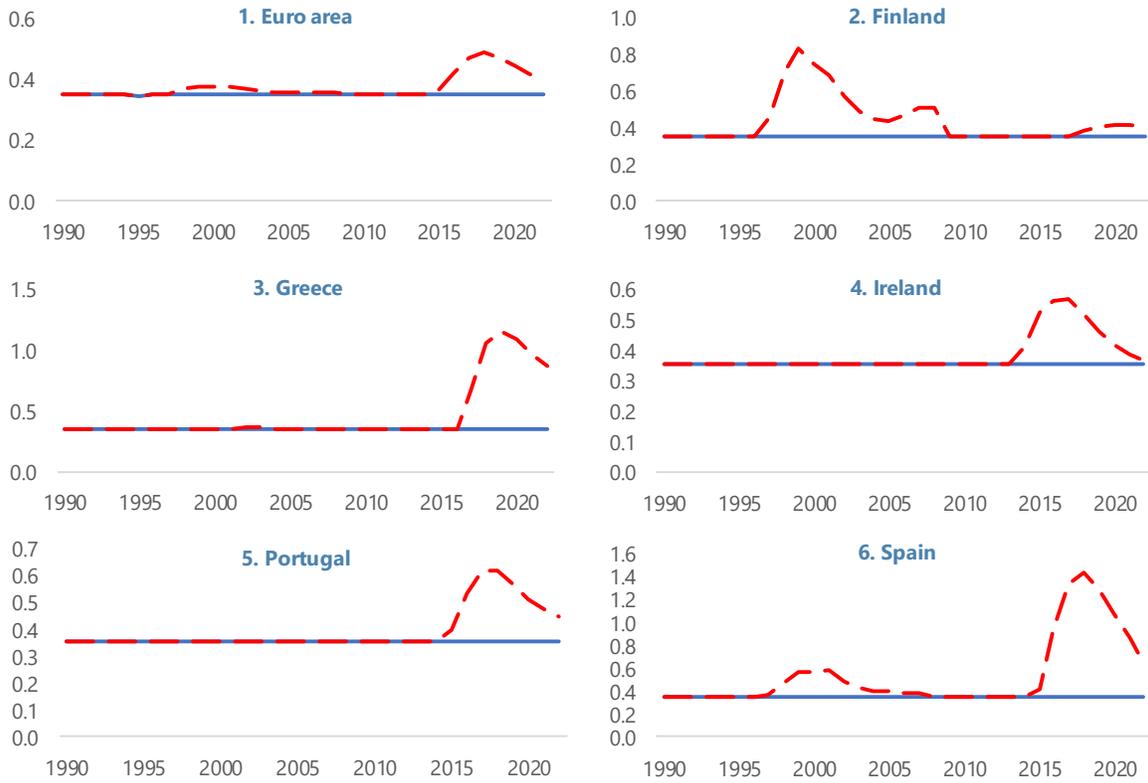
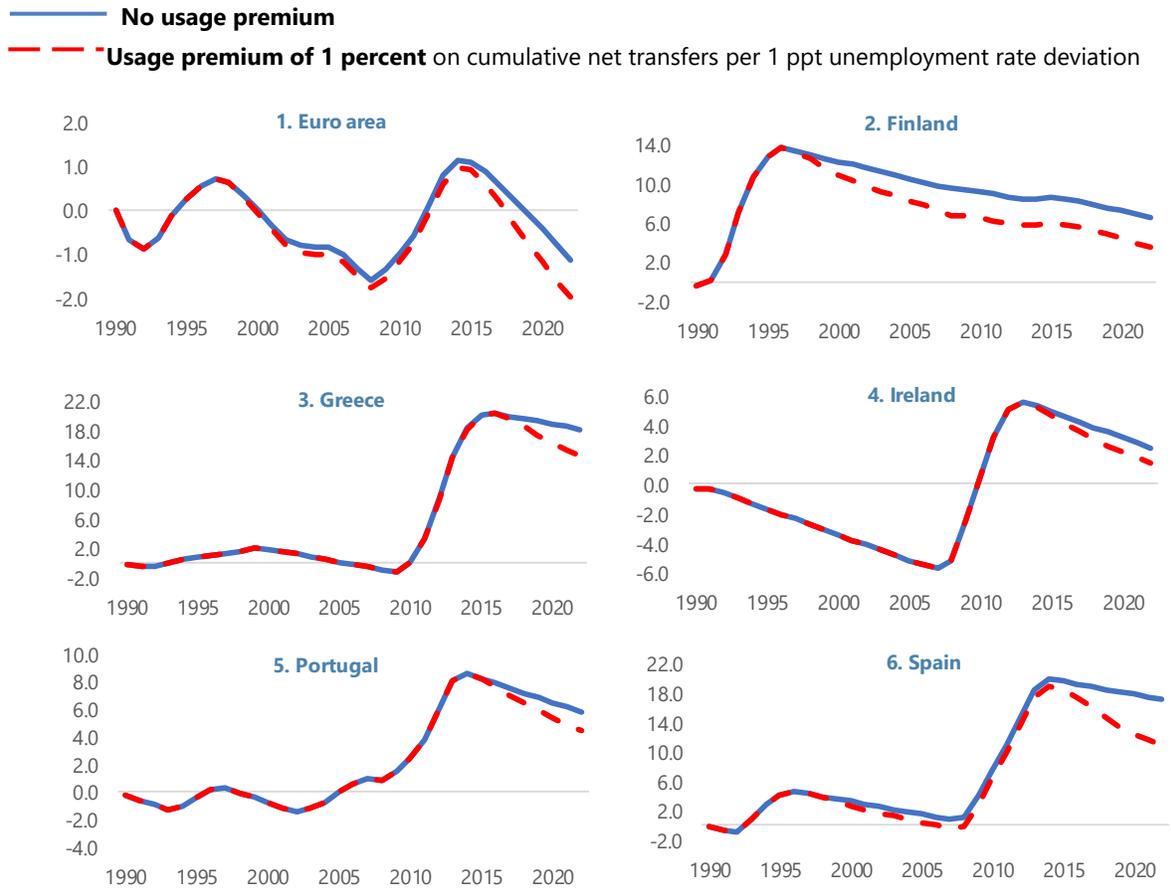
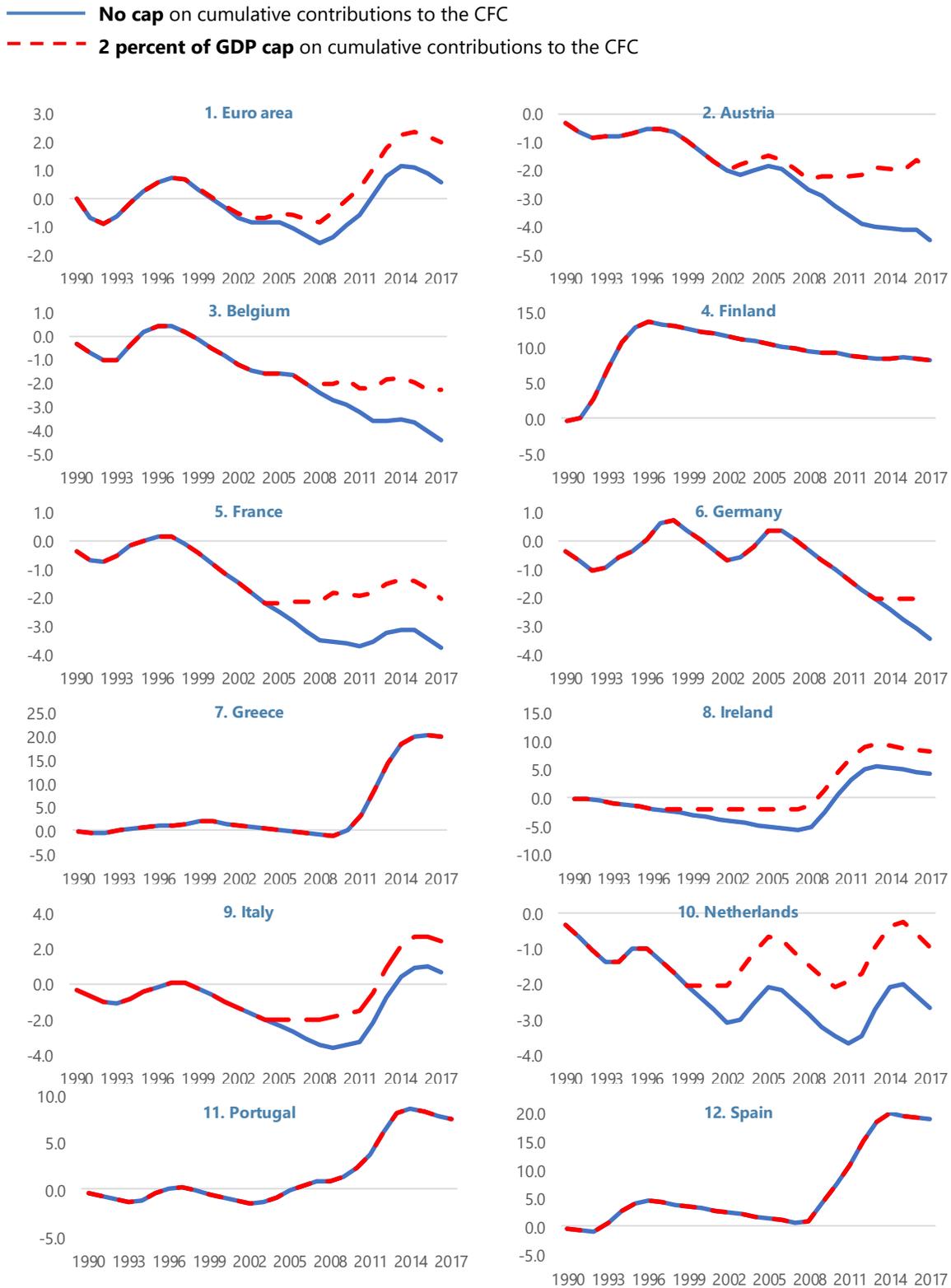


Figure 16. Cumulative Net Transfers from the CFC Under Different Usage Premia
(Percent of GDP)



Source: IMF WEO Database and IMF staff calculations.

Figure 17. Cumulative Net Transfers from the CFC when Contributions are Capped
(Percent of GDP)



Source: IMF WEO Database and IMF staff calculations.

References

- Andrle, Michal, Patrick Blagrove, Pedro Espallat, Keiko Honjo, Benjamin Hunt, Mika Kortelainen, René Lalonde, Douglas Laxton, Elenora Mavroeidi, Dirk Muir, Susanna Mursula, and Stephen Snudden (2015b). "The Flexible System of Global Models," IMF Working Paper 15/64.
- Carnot, Nicolas, Magdalena Kizior, and Gilles Mourre (2017). "Fiscal Stabilization in the Euro Area: A Simulation Exercise," Centre Emile Bernheim Working Paper 17/025.