European Stability Mechanism

The case for a loan-based euro area stability fund

A greater likelihood of significant asymmetric shocks, the war in Ukraine, and stretched fiscal space all underscore the importance of establishing a euro area fiscal stabilisation capacity. This paper considers the merits of a fund that provides loans for fiscal stabilisation purposes, referred to as 'stability fund'. First, we argue that this fund could better address moral hazard and be more easily set up than other proposed schemes. Second, using quarterly data from two decades, we model eligibility and the authorities' decision to request loans to simulate the loan portfolio of this fund had it existed all along, with the loan parameters calibrated to match what the ESM could provide. The results suggest the ESM's current lending capacity is sufficient to host this fund, and that the expansion of fiscal space can be macroeconomically significant and larger compared to other fiscal stabilisation capacity types.

Florian Misch
Martin Rey

May 2022

The authors gratefully acknowledge comments, helpful input, and/or preparatory work by Klaus Regling, Nicola Giammarioli, Rolf Strauch, Matjaž Sušec, Marion Salines, Robert Blotevogel, Olga Francova, John Goossen, Niels Hansen, Rimtautas Bartkus, Ramon Marimon, Andreja Lenarčič, Lluis Sanchis I Herrero, Edmund Moshammer, Filipe Janeiro, Thomas Ritter, Maroua Benghoul, and Michael Kuehl. Jens Lapointe-Rohde provided excellent assistance.

PDF	ISBN 978-92-95223-16-5	ISSN 2467-2025	doi:10.2852/03158	DW-AC-22-002-EN-N

More information on the European Union is available on the Internet (http://europa.eu). Luxembourg: Publications Office of the European Union, 2022

Table of contents

Foreword

NICOLA GIAMMARIOLI

Secretary General and Management Board Member

Europe's response to the Covid-19 pandemic has demonstrated its ability for strong, decisive, and collective action to avert economic disaster. However, further work on deepening Economic and Monetary Union (EMU) is still needed to make the euro area more resilient to shocks. One critical element missing in the EMU architecture is a common fiscal stabilisation capacity to help cushion against large external shocks that neither common monetary policy nor national fiscal policy can adequately address. In these instances, where the burden is too great to shoulder individually, such a capacity may alleviate the currently weakened policy space and improve overall resilience.

This paper presents a realistic proposal for a common fiscal stabilisation capacity that the ESM could provide, referred to as a 'stability fund'. This is a timely contribution, given the recent large shocks Europe has been experiencing from the pandemic and, most recently, those arising from the war in Ukraine. More broadly, climate-related risks stemming from extreme weather events and the transition to a low-carbon economy will inevitably affect our economies. These considerations add to the fact that recent recessions have been deep by historical standards.

Discussions on the establishment of a fiscal stabilisation capacity also come at an opportune moment amid the ongoing policy debate. Currently, the future of EU economic governance is being discussed in various forums and while the focus has so far been on fiscal rules, the need for further risk sharing in EMU cannot be ignored. Given the sources of uncertainty we observe today, the interconnected benefits of credible fiscal rules and a greater degree of risk sharing will better prepare the euro area for future challenges.

While common fiscal stabilisation tools have long been debated, discussions have often remained quite general and, at times, too abstract. This paper aims to fill this gap. It substantiates a concrete and feasible proposal and uses empirical evidence to demonstrate how it would have functioned if it had existed since the adoption of the euro. It also compares an ESM-based stability fund with alternatives conceptually and with results from simulations.

This stability fund would not replace other ESM instruments that can address internal economic imbalances and could complement other European fiscal stabilisation instruments. This paper makes a tangible contribution to the debate on a fiscal stabilisation capacity and, more broadly, on completing the EMU architecture to create a more robust and resilient euro area.

Introduction

Calls for a euro area fiscal stabilisation capacity have persisted since the inception of the common currency, and are conceptually well established.[1] Such a facility would provide fiscal space when common monetary policy or national fiscal policies cannot adequately respond to external shocks. This could materialise in two situations: first, when monetary and domestic fiscal space are insufficient relative to the size of a large common shock; or second, in case of asymmetric shocks or asymmetric exposure to common shocks that common monetary policy cannot address and fiscal policy cannot shoulder alone.[2] Furthermore, decoupling fiscal responses to shocks from national constraints could facilitate monetary fiscal coordination. This paper examines the merits of a revolving fund that provides stabilisation loans, referred to as a stability fund, from conceptual, practical, and empirical perspectives.

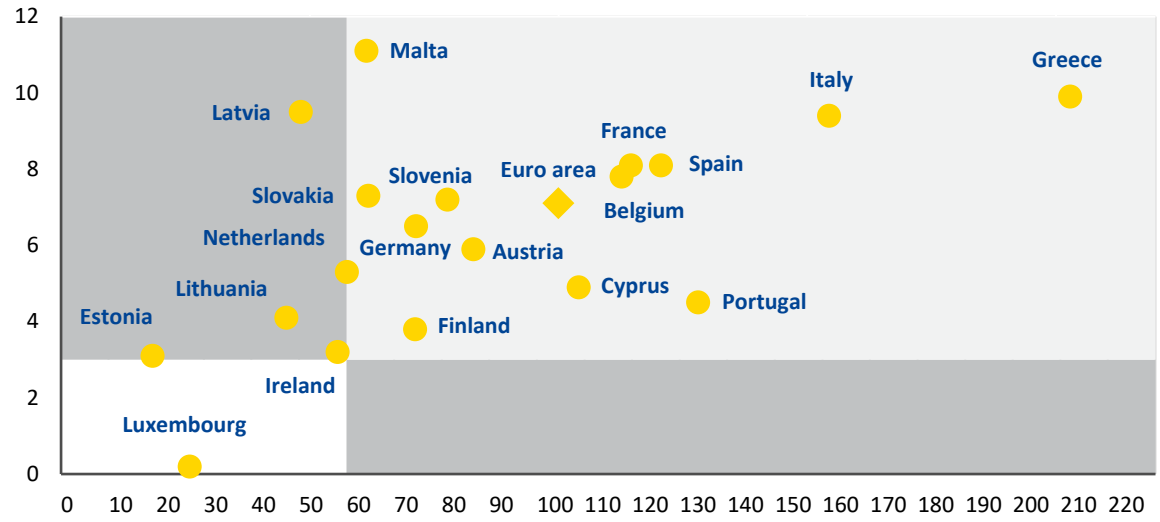
There are a few factors pressing the urgency of establishing a fiscal stabilisation capacity for the euro area:

- **First, record debt levels and large monetary stimuli over the last decade are constraining both monetary space in the euro area as a whole and fiscal space in many member states** (Figure 1). As a result, it could become harder to employ the euro area's existing macroeconomic policy toolkit to tackle large shocks in the near future. While fiscal buffers can be rebuilt over time, this would compete with large spending needed to support the green transition.
- **Second, the potential for severe external and asymmetric shocks is increasing.** The war in Ukraine and climate change can directly or indirectly inflict significant shocks on the euro area. So far, the evidence pointing to a greater likelihood of extreme weather events such as droughts, strong winds, and flooding as a result of climate change appears mixed.[3] However, as climate change intensifies, extreme weather events could become more frequent and inflict greater economic damage. The economic costs of recent disasters have been significant. For instance, the 2021 wildfires in Greece triggered expenditure of around 0.3% of gross domestic product (GDP) that year, with additional expenditure budgeted for 2022.[4] Less direct effects from the transition towards carbon neutrality could emerge from differences in countries' exposures or sudden shifts in consumer or investor sentiment (Basel Committee on Banking Supervision, 2021).
- **Third, as argued by Kuehl et al. (2022), the depth of recessions could increase in the future, although evidence remains limited to date.** The academic literature so far does not support the hypothesis that business cycle amplitudes have increased.[5] However, the global financial crisis and the Covid-19 pandemic led to economic downturns not

1. Literature discussing the merits of a common fiscal policy in currency unions dates back to the 1970s; see Werner (1970), Marjolin et al. (1975), MacDougall et al. (1977), and Padoa-Schioppa et al. (1987).
2. The euro area also lacks sufficient capital and labour mobility to help cushion the effects of asymmetric shocks, further underlining the need for a fiscal stabilisation capacity; see CEPS (2017) for a discussion.
3. For instance, Paprotny et al. (2018) examine the effects of floods in Europe. After correcting for flood exposure, they find a considerable decline in annual financial losses from floods over recent decades, but this could have been driven by widespread underreporting of smaller floods. By contrast, insurance companies in Germany estimate that claims from hail and floods in 2021 stand far above the long-term average, and at record highs.
4. Greek Prime Minister approves €500 million budget for wildfire relief, reforestation | Reuters
5. Most literature suggests a peak in growth volatility during the global ginancial crisis was more an outlier than a structural increase in GDP fluctuations, and that overall business cycle volatility has not increased in the years after the crisis (see Charles et al., 2018, Gadea et al., 2018, and Grazzini and Mazzaro, 2022).

experienced in advanced economies since the end of World War II. In addition, while there has always been asymmetry between recessions and expansions, recent papers suggest expansions have become increasingly smoother and more prolonged than recessions, given the increasing leverage of households and firms (Jensen et al., 2020) and amplification mechanisms in the financial sector (Adrian et al., 2019). Business cycle volatility could further increase from financial sector growth.

Figure 1
Debt and deficit ratios in euro area member states (2021)
(x-axis as debt in % of GDP, y-axis as deficit in % of GDP)



Notes: Data as of 2021. Shaded area refer to debt (in % of GDP) and deficits (in % of GDP) below 60% and 3%, respectively.
Source: AMECO

Discussions on a euro area stabilisation capacity are regaining momentum and could merge with ongoing debate on EU fiscal framework reform. While the Covid-19 crisis had mostly halted policy debates on a fiscal stabilisation capacity in the euro area, the discussions have resurfaced in recent months.[6] The pandemic demonstrated the potential for political support from all member states for common (temporary) fiscal instruments, at least in extreme scenarios. Current debates on EU fiscal governance reforms offer fertile ground for discussions on the establishment of a fiscal stabilisation capacity, a topic closely linked to fiscal frameworks. Moreover, broadening the scope of the discussions to include the establishment of a fiscal stabilisation capacity could help finding a compromise in the negotiations. Francová et al. (2021) also discuss links between EU fiscal framework reform and establishing a euro area fiscal stabilisation capacity.

A substantial body of literature proposes many different types of euro area fiscal stabilisation capacities. The proposals are generally economically sound and can be grouped into three broad categories: insurance funds, rainy-day funds, and revolving funds. They differ in their degree of risk sharing and/or mutualisation as well as the mix of grants and loans in addressing shocks, but the distinction can be blurry. Many recent proposals are based on some form of a European unemployment benefit scheme (either those entailing direct transfers to the unemployed or national re-insurance schemes with transfers to the government), essentially

6. Examples include a presentation by Philip Lane and a speech by Paolo Gentiloni. Maduro et al. (2021) also discuss a standing contingent facility that could serve as a tool for financing investments and reforms in member states experiencing severe shocks.

different versions of insurance funds. The proposals can be further distinguished by their activation conditions – conditions triggering pay-outs and prior eligibility to access funding – and if funds are earmarked for a specific purpose. We categorise and discuss these proposals in detail in the next section.[7]

We propose a euro area stability fund that would provide loans in the event of external shocks and that is not mutually exclusive to other proposals. With a lending capacity of around 2% of euro area GDP, this fund would provide loans with a maturity of up to 10-years and a size of up to 4% of national GDP once per every activation event. We assume the ESM's borrowing rates and fee structure for this facility. Eligibility for loans would require beneficiary countries not be subject to excessive deficit or imbalance procedures and not currently participate in a macroeconomic adjustment programme.

While most academic papers favour various versions of insurance funds, we argue that revolving funds have many merits worth considering from a practitioner's perspective. We apply several criteria to evaluate the different proposals including: the ability to avert moral hazard; the ease and speed of scheme implementation; and the potential size and stabilisation impact. First, as loans must be repaid, concerns about moral hazard or permanent unidirectional transfers are less important than in any scheme providing mutualised grants, making political support more likely. Second, a revolving fund could be more easily and cheaply set up, especially if employing the existing ESM infrastructure, thus ensuring faster operationalisation – ideally ahead of any future major shock. Finally, the potential stabilisation impact of our scheme via the provision of fiscal space could be macroeconomically significant and, at times, larger than that of insurance funds.

We examine our proposal empirically and compare it to insurance funds using simple simulations. Using quarterly data dating back to the introduction of the euro, we simulate in Section 3 the loan portfolio of our proposed stability fund as if it had always existed, with the loan parameters calibrated to match the loan types the ESM could provide. We model eligibility, alternative trigger conditions, and the authorities' decision to request the loan. The latter is driven by the difference between conditions of market financing and of the loan. We demonstrate that:

- A loan-based stability fund would have only relied upon available ESM resources, suggesting no need for additional resources from euro area member states.
- The associated macroeconomic stabilisation effects would have been significant and in some circumstances larger than that of commonly proposed insurance funds that provide grants.
- Triggers based on the unemployment rate fall well short of a hypothetical 'perfect' trigger indicator, signalling that a fiscal stabilisation capacity would require expert judgement and/or research into multidimensional indicators.

The remainder of the paper is organised as follows. In Section 1, we categorise and describe the existing proposals, using our typology for fund types. In Section 2, we evaluate the proposals using the criteria of moral hazard aversion, ease of implementation, and magnitude of

7. We use the term fiscal stabilisation capacity, fiscal stabilisation function and central fiscal capacity interchangeably. 'Stability fund' refers to our specific proposal for a fiscal stabilisation capacity. Other ways to achieve mutual insurance and centralise fiscal policy exist; see Bilbiie et al. (2021) for an excellent discussion. For instance, the European Commission's budget could be restructured to allow for greater fiscal stabilisation, but that would require larger contributions from the member states, higher own-resource revenue, or cutting existing programmes. In principle and omitting legal issues, a fiscal stabilisation function could be financed through the European Central Bank; see Bartsch et al. (2019) for direct monetary financing of fiscal outlays. Beetsma et al. (2021) propose a more complex central fiscal capacity that would respond to aggregate or country-specific and regional shocks, employing some combination of the Recovery and Resilience Facility, the existing ESM toolkit, and the EU Solidarity Fund.

stabilisation, comparing them conceptually to our proposal. Section 3 presents simulations demonstrating some of the hypothetical implications had our proposed stability fund been in place since the launch of the euro. Section 4 summarises our findings and offers a path for future research.

1. Design of a fiscal stabilisation capacity

Design principles

A few design principles can help to evaluate proposals for a fiscal stabilisation capacity. Some of these principles are well established in the academic literature, while others – mostly ignored – are nonetheless important from a practitioners' perspective. Other studies have also developed high-level principles that do not immediately translate into viable and specific policy choices; see Hagen and Hammond (1995) and Furceri and Zdzienicka (2015) for a discussion.

- **First and foremost, there is wide agreement that a fiscal stabilisation capacity should not induce moral hazard and, relatedly, should not result in permanent budgetary transfers to specific countries.** Moral hazard arises if the fiscal stabilisation capacity weakens incentives for structural reform and sound fiscal policies (Beetsma et al., 2018). This is especially important when the magnitude of the shock and the amount of reform needed cannot be separately observed (Beetsma and Bovenberg, 2001). Feld (2018) argues that moral hazard cannot be eliminated, suggesting that a fiscal stabilisation capacity should not precede reform and consolidation. Bilbiie et al. (2021) suggest that a fiscal stabilisation capacity in general is prone to result in unidirectional transfers over time rather than in transfers to all countries, given the persistence and correlated distribution of shocks in the EU. Failure to credibly and reliably address moral hazard and permanent transfers-related concerns can therefore completely undermine political support for a fiscal stabilisation capacity among euro area member states.
- **Second, ease of implementation is important for any proposed fiscal stabilisation capacity, yet sometimes ignored in the academic literature.** Delayed implementation could mean that a fiscal stabilisation capacity is not operational when it is needed in the future. Delays can arise if the scheme requires a new institution, especially if it is to be a new issuer in capital markets and/or requires other complex procedures and arrangements that need to be agreed upon, including for instance the new institution's guarantee structure. Even if a scheme is implemented, delays until it becomes operational can occur if, for instance, the instrument needs to accumulate contributions before it can make any meaningful disbursements. This suggests that any euro area fiscal stabilisation capacity should build on the EU's existing institutional architecture, or that of the euro area itself.
- **Third, the design of a fiscal stabilisation capacity should maximise the potential stabilisation effects.** Stabilisation effects depend on the size of the transfers, the cost of participation in the scheme, and the use of the funds. Generally, loans that require service and repayment imply that the macroeconomic effects are likely to be smaller relative to grants. However, in practice and depending on the design of the fiscal stabilisation capacity, loans can have a larger stabilising effect (explored further in Section 3), given the cost to the euro area member state for contributing over time to finance the grants. The implications of how the funds are used are largely independent of the design of the fiscal stabilisation capacity. If the beneficiary country still has market access, it could proportionally replace long- and/or short-term market borrowing or choose to increase expenditure proportionally while leaving market borrowing unchanged relative to the position that would have prevailed without any transfers.[8]

8. With an upward sloping yield curve, the fiscal savings are largest if long-term borrowing is replaced. By contrast, savings

- **Fourth, the activation conditions should balance the need for speedy disbursements with reliable identification of external shocks and appropriate eligibility criteria and safeguards.** Automatic disbursement of funds provides speed and minimises the scope for disputes (Arnold et al., 2018). This can be achieved by transparent and simple quantitative trigger conditions. Complex procedures, rules, and eligibility criteria could all delay activation in cases disbursements are urgently needed. However, automatic activation could be susceptible to false alarms or 'missed' external shocks, thereby eroding political support, intensifying the potential of moral hazard, and reducing the instrument's economic value. Appropriate eligibility criteria should prevent disbursement to countries where shocks result from internal structural imbalances rather than from external factors. Such countries could instead be potential candidates for loans under a macroeconomic adjustment programme. Broad safeguards should be put in place to prevent any uses of funds that do not serve macroeconomic stabilisation. However, most plausible uses support macroeconomic stabilisation, albeit to different degrees.
- **Fifth, the cost for euro area member states to participate in the fiscal stabilisation capacity needs to be sufficiently low.** High annual contributions or large additional capital guarantees may deter countries from supporting the establishment of a fiscal stabilisation capacity from the onset. This is particularly true for countries that are less likely to use and/or need the fiscal stabilisation function.

Typology of design proposals

The principles outlined can be used to evaluate the various proposals in the literature and help guide the design of a fiscal stabilisation capacity in practice. The existing literature offers a range of proposals for a fiscal stabilisation capacity. We first distinguish the underlying fund type as either insurance, rainy-day, or revolving funds. Each type differs by the degree of risk sharing and/or mutualisation, as well as the mix of grants and loans provided in the case of shocks. The distinction can sometimes be blurry as some proposals are hybrid funds, and the terminology used often varies.

Proposals for insurance funds are the most prominent. In their basic form, such funds pool contributions from different countries to finance grants to euro area member states that meet the activation criteria. As the pool of contributions may not be sufficient at every point in time, especially at the outset, some proposals allow for the fund to borrow from the market and run annual deficits and surpluses (which need to be balanced out over some period of time). These proposals typically include some earmarking of funds to support the payment of unemployment benefits, thus referred to as unemployment insurance funds. However, strictly speaking, earmarking is independent from the underlying fund design. Unemployment insurance funds are distinguished as either 'genuine' – they make direct payments to individuals, or 'equivalent' – they co-insure or re-insure national unemployment insurances through payments to member states; see Beblavý and Lenaerts (2017) for an excellent summary of insurance funds and their main features. For example, Dolls (2020) proposes an insurance fund that co-finances national short-term unemployment insurance systems where the amount is capped at the hypothetical additional expenditure provided by some benchmark national unemployment system in case of a severe shock. Enderlein et al. (2013) and Dolls et al. (2016) propose relatively basic insurance

---

are smaller if only the short-term borrowing is reduced, but the maturity structure of borrowing increases relative to the counterfactual of no loans from the fiscal stabilisation capacity.

funds that require the net position of the fund to be balanced on an annual basis, thereby excluding the possibility for borrowing from financial markets. Furceri and Zdzienicka (2015) and Enderlein et al. (2013) examine plain insurance funds without any earmarking.

The proposals for insurance funds address moral hazard in different ways. Since insurance funds could lead to permanent transfers and induce moral hazard, some versions include provisions to calibrate contributions based on prior usage of the scheme, referred to as 'clawback mechanisms' or 'experience ratings'. For example, Beblavý and Lenaerts (2017) propose a clawback mechanism whereby the standard contribution is doubled when cumulative net contributions are negative and exceed 1% of GDP over three consecutive years. Bénassy-Quéré et al. (2018) also propose that higher drawings from the fund lead to higher national contributions. Oksanen (2016) proposes an insurance fund without earmarking but includes a simple clawback mechanism whereby contributions and transfers need to balance over 14-year periods. Such features would not prevent unidirectional transfers over time but would ensure that recipient countries bear a significant share of the cost.

Rainy-day funds have attracted far less attention, but their design is similar to insurance funds. Lenarčič and Korhonen (2018) propose a rainy-day fund in its purest form: in bad times, countries could draw upon their individual contributions made in good times. This can be complemented by loans financed through borrowing from the contributions of other countries. The non-mutualised saving-loan structure would by construction exclude permanent transfers. Arnold et al. (2018) propose a rainy-day fund that relies on contributions made in good times while also allowing for some pooling of contributions. To avoid permanent transfers, they suggest imposing premiums on contributions based on past usage, caps on cumulative net transfers, and caps on cumulative net contributions. While these features categorise rainy-day fund proposals as similar to insurance funds, rainy-day fund proposals typically do not assume that transfers are earmarked for specific purposes. Dullien and Perez del Prado (2017) suggest a hybrid rainy-day fund, whereby 80% of the country's pay-ins would go into a national compartment while the remaining 20% would be pooled. Disbursements would only occur if national contributions exceed 1.25% of national GDP.

Revolving funds reduce the risk of inducing moral hazard or permanent transfers, even without additional features. These funds provide loans that require repayment. The only scheme of this nature that has been implemented so far – the European instrument for temporary Support to mitigate Unemployment Risks in an Emergency (SURE) – is a variant of a revolving fund.[9] Our proposal, which we refer to as a stability fund and discuss in greater detail in Section 2, is another version of a revolving fund.

Insurance and rainy-day funds are likely to require more time to become operational if annual contributions are limited in size. First, insurance funds are relatively complex to implement, especially when they include clawback and experience rating mechanisms as well as a borrowing capacity. In practice, a range of parameters would need to be calibrated which could be politically contentious. This includes the magnitude of annual contributions which widely differ across proposals. Second, as both types of funds rely on insurance contributions that are accumulated over time (at least when annual contributions are kept relatively small), there may be further delays until these funds become operational depending on how much and when they are allowed to borrow. By contrast, a revolving fund using existing infrastructure can become operational relatively quickly as demonstrated by the rapid setup of the ESM's Pandemic Crisis

9. The SURE instrument was set up during the pandemic and provides loans to finance the cost of short-term work schemes up to a total volume of €100 billion financed through market borrowing. Prior to the Covid-19 crisis, the European Investment Stabilisation Function is the only proposal that has been seriously considered at the policy level; see European Commission (2018), European Central Bank (2019) and the European Economic Social Committee (2018) for details.

Support instrument in 2020.

In practice, any difference in the macroeconomic impact of similar-sized disbursements of insurance, rainy-day, and revolving funds could be small in at least some circumstances. Intuitively, the economic effects of a revolving fund that provides loans and a rainy-day fund that provides self-financed grants (coming directly from own contributions) and loans from pooled contributions could be similar. Likewise, insurance funds often include clawback and experience rating mechanisms that imply either a portion or the full amount of a grant is financed through contributions by the individual beneficiary country over time. We explore these issues in greater detail in the following two sections.[10] To maximise the stabilising effects of insurance funds in the event of large shocks, Gros (2014) proposes including provisions for a deductible paid by the member states, similar to private insurance, so that there would be no disbursements for small shocks.

The type of fund is largely independent from any numerical condition that triggers disbursement and earmarking of the funds. The numerical trigger is mostly independent of the type of fund, but critical because it helps identify the occurrence of external shocks that threaten macroeconomic and financial stability, which in turn activates disbursements. Genuine unemployment insurance funds are the only schemes that work continuously and independently from any macroeconomic trigger conditions (Beblavý and Lenaerts, 2017). Several types of earmarking other than earmarking for unemployment benefits have been proposed in the literature, with Enderlein et al. (2013) as an example suggesting earmarking for payroll tax cuts. However, given that government funds are fungible, earmarking can have little relevance in practice, especially when the earmarked spending category is broad. If the earmarked spending category is too narrow, earmarking could delay disbursements, thereby undermining the stabilisation objective. For instance, while it may be desirable to incentivise growth-enhancing public investment through earmarking, there may be a shortage of shovel-ready projects when funds are to be disbursed. Finally, across-the-board earmarking may not correspond to the country-specific tax and spending categories where fiscal multipliers are highest (Enderlein et al., 2013).

The most prominent numerical trigger condition proposed in the literature relates to the unemployment rate. It is often argued that unemployment-based trigger conditions have many advantages because the unemployment rate is available monthly with little delay and is rarely revised significantly. Most proposals suggest triggering require the unemployment rate increase by one to two basis points above some longer-term average (five years or more), as well as some shorter-term average (usually one to two years); see for instance, Carnot et al., (2017) and the proposal for the European Investment Stability Function (European Commission, 2018). Dolls et al. (2016) also propose an unemployment-based trigger, but suggest the increase in the unemployment rate must be larger than the overall change in euro area-wide unemployment.

However, unemployment-based triggers have been heavily criticised despite their advantages. For instance, the European Central Bank (ECB) (2019) points out the moral hazard-inducing effects of unemployment-based triggers given that they penalise labour market reforms that reduce unemployment. In addition, unemployment-based triggers make it hard to distinguish temporal shocks from structural weaknesses and would need to be corrected to account for people benefitting from short-term work schemes, which can be difficult in practice. The European Economic and Social Committee (2018) therefore suggests a different and more powerful trigger would be needed to either replace or complement unemployment-

10. The stabilisation effects also depend on the time profile of the contributions and the repayment of any loans. In principle, increasing/decreasing contributions and loan repayment amounts in cyclical upswings/downswings could further support the macroeconomic stabilisation effects, but such a feature complicates the design of any fiscal stabilisation capacity.

based triggers.

Other proposed triggers also carry severe drawbacks. Bénassy-Quéré et al. (2018) propose a trigger based on hours worked or the wage bill. Beetsma et al. (2018) suggest basing the trigger on sectoral changes in world trade to alleviate concerns about moral hazard. Enderlein et al. (2013) propose a trigger that depends on the difference between the national and euro area output gaps, not least because output gaps are more difficult to manipulate as a way to maximise the chances of receiving funds than unemployment-based triggers. However, output gap-based triggers could lead to severe disagreements about measurement (Arnold et al., 2018) and are subject to large and frequent revisions (Dullien, 2015). Furthermore, real GDP growth deviations (the difference between real GDP growth and its moving average) give rise to large revisions and tend to be volatile (Arnold et al., 2018).

Safeguards and eligibility criteria have received less attention in the literature so far. Proposals for insurance funds that provide co-financing for national unemployment insurance schemes sometimes include a provision that national schemes fulfil minimum requirements to ensure eligibility (Dolls et al., 2016). Enderlein et al. (2013) suggest that eligibility require the adherence to minimum macroeconomic stabilisation policy standards, for example within social security systems or labour market institutions. Bénassy-Quéré et al. (2018) propose ex-ante conditionality including compliance with fiscal rules, and the requirement that any funds are used to finance 'relevant' spending and raise overall spending.

2. Proposal for a stability fund hosted by the ESM

The ESM could host a euro area stability fund that would safeguard financial and macroeconomic stability by providing loans to euro area member states in case of external shocks. We propose an overall envelope of €250 billion, or slightly above 2% of 2019 euro area GDP. This would fit within the existing ESM lending capacity so that no additional guarantees or tax-financed contributions from member states would be necessary. To maximise the stabilising effects of the loans, we further propose a loan maturity of up to 10 years. This, together with an interest-and-fee-only grace period of three years would help ensure that loan repayments do not undermine the economic recovery from the initial shock, thereby augmenting the stabilising effects of the loans. The interest rate would be the prevailing ESM 10-year market rate, implying that the ESM would use a separate silo to fund such fiscal stabilisation loans. Specific loan amounts would be capped at 4% of a member state's GDP for each activation event. This is more than twice the median disbursement from the SURE instrument when measured in 2020 GDP, and far above the amounts the proposed European Investment Stabilisation Function could offer. The fee structure for the ESM's Pandemic Crisis Support credit line would apply.

This configuration of loans would ensure that disbursements are attractive for most euro area member states. Member states that continue to have market access would only request loans if they are economically advantageous from their perspectives. That, strictly speaking, would be the case when the net present value of the cost of the loan is below that of same-maturity bonds. Appendix A presents an analytical expression of this condition, and in the next section we simulate the request of loans empirically. In practice, this condition may not be sufficient, and the likelihood of requesting the loan increases with wider cost advantages and longer loan maturities – which would further justify our choice of up to 10-year maturities. Maximising the economic benefits of the loans is also important in the presence of any negative political stigma associated with requesting the loans.

Table 1
Parameters of the loans

Loan parameter	Value
Loan maturity	Up to 10 years
Loan size	4% of national GDP
Grace period	Up to three years
Margin rate	0.1%
Up-front service fee rate	0.25%
Annual service fee rate	0.005%
Interest rate	ESM 10-year rate

Source: Authors' compilation

The stability fund can be activated when an external shock puts at risk the financial stability of the euro area as a whole or of one of its member states. The activation condition has three components:

- Firstly, to ensure that the shock is external and not a result of internal imbalances, member states would only be eligible if not subject to the excessive deficit procedure or the excessive imbalance procedure, and if not participating in a macroeconomic adjustment programme. This is similar to provisions in the ESM Guideline on

Precautionary Financial Assistance and the European Investment Stabilisation Function proposal.[11]

- Second, the quantitative trigger condition is used to help identify the presence of a large shock. We employ an often-proposed unemployment-based trigger in the simulations in Section 3, given a lack of suitable alternatives. However, we suggest exploring whether there is a more reliable composite indicator that would encompass several higher frequency indicators such as the Purchasing Managers' Index (PMI) which would address some of the criticism surrounding pure unemployment-based triggers (see Ruggeri Cannata R., 2021).
- Third, expert judgement would complement the numerical trigger condition, which could miss important shocks and/or create false alarms (see Table 2 for a summary).

Table 2
Conditions for activation of the stability fund

	Condition	Description
Request	1) Economic advantages	- Member states will only request disbursement if it makes economic sense - Member states compare the cost of the loan with the cost of market financing with the same maturity
Activation condition	2) Numerical trigger	- Helps determine if a member state has been hit by a significant shock - Requires significant increase of unemployment rate relative to a short and long-term average
	3) Expert judgement	- Complements the numerical trigger condition - Helps avoid missing important shocks and/or setting false alarms
	4) Eligibility	- Requires that member states are not subject to a macroeconomic adjustment programme - Helps ensure shock is external and macroeconomic problems are not driven by internal imbalances or structural weaknesses
Disbursement	5) Member state commits to use funds for macroeconomic stabilisation	- In most cases, this safeguard will not limit discretion of a member state with respect to the use of funds - This safeguard would only prevent extreme cases of waste or pursuing entirely political objectives

Source: Authors' compilation

The procedure for disbursing funds would be based on ESM Treaty rules and similar to existing precautionary instruments. Once a member state requests support from the stability fund, the ESM and the European Commission, in liaison with the ECB, would assess financing needs, debt sustainability, and financial stability, and whether the activation condition is met. The ESM Board of Governors may then decide to approve the disbursement in principle, on the basis of these assessments and the eligibility criteria, including the activation condition. Thus, the ESM's

11. The ex-ante eligibility criteria would require compliance with EU law, e.g., the absence of Council decisions on no effective action under the Excessive Deficit Procedure or successive recommendations under the Macroeconomic Imbalance Procedure.

governing bodies would maintain their decision-making powers.

Disbursement of funds would be subject to a safeguard. The safeguard would require any beneficiary member state to commit to using the funds for stabilisation, which differs from earmarking the funds. This would help prevent (implausible) cases of significant waste or the pursuit of political objectives incompatible with stabilisation including, for instance, politically motivated tax cuts for the very rich. However, from a legal perspective, this would require clearer definition as to what constitutes wasteful or entirely politically motivated uses of the funds.

The proposed stability fund has several attractive features. Firstly, it addresses moral hazard effectively because it relies on loans which must be repaid, so that the recipients bear most of the cost of the loans with non-recipients only shouldering costs by providing guarantees. In addition, country-level disbursements would be subject to caps. Second, the stability fund would become operational more quickly than other proposed types of fiscal stabilisation capacities. On the one hand, a new ESM instrument could be established as foreseen under Article 19 of the ESM Treaty or by adapting the existing precautionary instruments, as done for the ESM's Pandemic Crisis Support instrument. On the other hand, reliance on a revolving fund rather than other types of funds implies that delays that would otherwise arise due to lengthy periods needed to accumulate contributions would not occur; once established, it would be operational within months rather than years. Finally, the ESM could host such a facility without the need for more paid-in or callable capital or the imposition of any cost on euro area taxpayers. This would make it particularly attractive to euro area member states that are unlikely to draw funds from any type of fiscal stabilisation capacity. As a minor drawback, some countries with historically very favourable market access will never request a loan, but they would not need any other type of fiscal stabilisation capacity either.

Intuitively, the stabilising effects of loans from our proposed stability fund could be larger than grants from insurance funds in some circumstances. First, the ESM's available lending capacity could enable larger disbursements compared to insurance funds with limited borrowing capacity when contributions are still being accumulated. Second, in net present value terms, the cost of grants from insurance funds with clawback mechanisms could well be higher than that of loans, depending on the loan parameters and other assumptions from the perspective of member states (as we show in Section 3). The reason is that a 'full' clawback mechanism means the cost of any grant would be borne by the beneficiary country itself, both through contributions before and after the disbursement.

3. Simulations

Data and methodology

We conduct a frequency study to see how our proposed scheme would have functioned had it existed in the past, by identifying ex-post when activation conditions for the stability fund would have been met. We use data for all countries that are currently part of the euro area between Q1 2000 and Q2 2021, with some gaps (see Appendix B for a summary of all the variables used in this this paper).[12] Our methodology is similar to that of Carnot et al. (2017), who conduct this type of analysis for their proposed version of an insurance fund that is activated by an unemployment rate-based trigger. Their objective is to compare the frequency and time of activation of the fund under annual real-time and final ex-post data.

Our objectives differ, and we extend their analysis in several ways. First, we use quarterly rather than annual data, which is arguably more relevant from a practitioner's perspective because it would be inconceivable that a fiscal stabilisation capacity be triggered based on annual data (see Appendix B for a full data description). Second, we benchmark the unemployment-based trigger using hypothetical and perfect indicators of recessions – which are not available in real-time – to assess the reliability and plausibility of such a trigger. Third, we simulate the take-up, based on the estimated savings of the loan from the stability fund relative to market financing, by calculating the net present costs of loans and bonds (see Appendix A for methodological details). Fourth, we present the simple metrics of the potential macroeconomic effects and compare them to grants from a simple insurance fund, again using expressions of the net present costs (see Appendix C for methodological details).

Benchmarking the unemployment-based trigger condition

To evaluate unemployment-based triggers, we benchmark them against GDP-based recession indicators. Unemployment-based triggers are the best real time triggers, given that they are available monthly with only small publication lags and revisions. In contrast, we consider GDP-based recession indicators to be most reliable ex-post because they identify when a trigger should have activated the stability fund and are not directly 'blurred' by labour market reforms or short-term work schemes. However, these triggers cannot be used in practice given publication lags and revisions. We then compare when the unemployment-based and GDP-based triggers would historically have activated the stability fund, determining whether the unemployment-based indicator would have triggered false alarms or missed recessions.

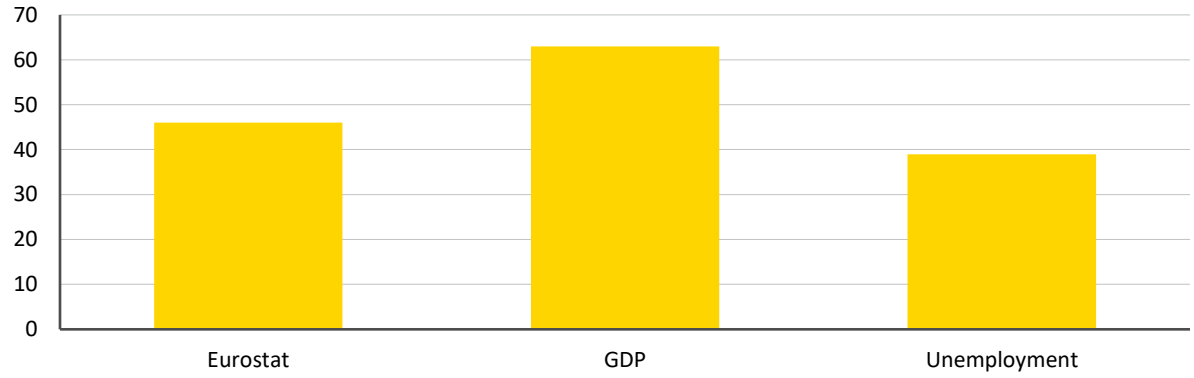
We compile an unemployment-based trigger that broadly corresponds to the consensus in the literature. The trigger condition is fulfilled when the seasonally adjusted monthly unemployment rate exceeds both the short-term (two preceding calendar years) and long-term (15 preceding calendar years) averages.[13] We then compile two benchmark indicators for comparison. First, we use Eurostat's business cycle clock to identify past recessions, which we consider as trigger events (see Ruggeri-Cannata, 2021; and Anas and Ferrara, 2004 for details on Eurostat's methodology). Second, we consider the trigger condition to be met if seasonally adjusted quarterly GDP shrinks in two consecutive negative quarters (and where two recessions need to be separated at a minimum by two quarters of positive quarter-on-quarter GDP growth).

12. Due to the historically low debt issuances and hence absence of bond yield data, Estonia has been omitted from this study.

13. We use annual unemployment data to compute the long-term averages because there are gaps in the higher frequency unemployment data obtained from labour force surveys for the period before 2000.

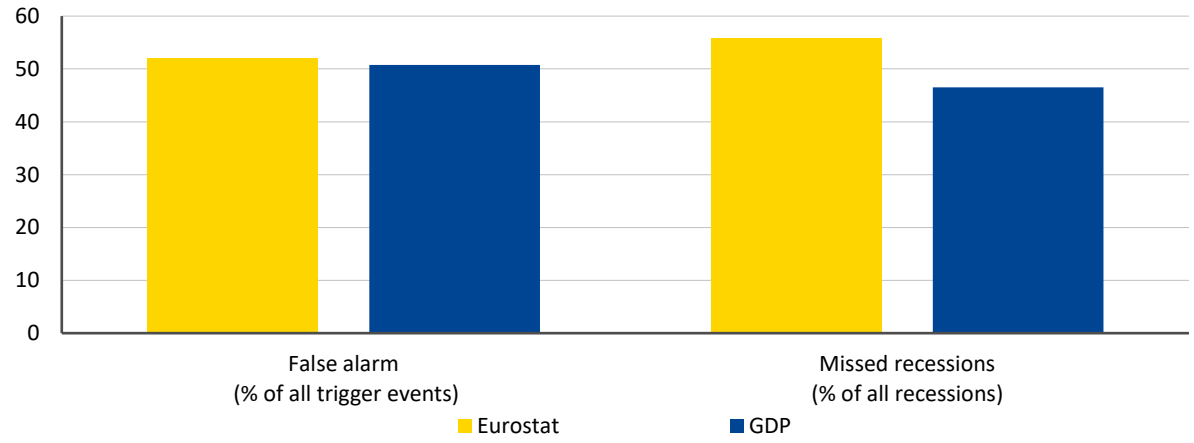
As expected, the unemployment-based trigger both creates false alarms and misses recessions. Figure 2.b suggests that out of all the trigger events detected by our unemployment-based indicator, about 50% are false alarms based on the two GDP-based triggers. In addition, out of all the 'true' recessions that the GDP-based triggers identify, the unemployment-based trigger would also miss about half.[14] Overall, the different 'triggers' we use identify between 39–63 euro area recessions observed during the period we consider (see Figure 2.a).

Figure 2.a
Activation events by trigger type
(number of activation events)



Source: Authors' compilation

Figure 2.b
Precision of unemployment trigger
(in %)



Source: Authors' compilation

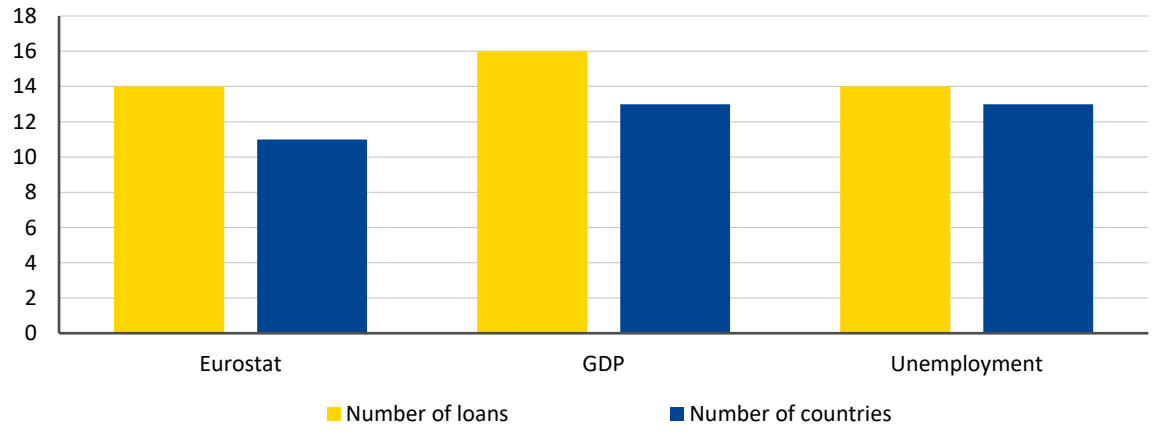
14. We consider the unemployment-based trigger to identify an actual recession if it is triggered within two quarters of a GDP-based trigger. Similarly, a recession is said to be missed if no unemployment-based trigger event occurs within two quarters of the start of the recession.

Portfolio size of the stability fund

The size of the stability fund portfolio over time determines whether the ESM's existing lending capacity would be sufficient. In our simulations, loan disbursements occur in quarters with trigger events for countries meeting the eligibility criteria and where a loan request would be economically advantageous. To assess the economic benefits, we compare the net present cost of the loan using the parameters of Table 1 to that of a bond with the same maturity under prevailing market conditions, in our case the contemporaneous country-specific 10-year benchmark rate.[15] We assume that loans are requested when the bond yield is higher than the interest rate of the loan and if the net present cost of a bond exceeds that of the loan. We also assume the discount rate corresponds to the contemporaneous 10-year benchmark rate (see Appendix A for more details).

Given our assumptions and parameters, the stability fund would have resulted in a loan portfolio size comfortably below the maximum lending capacity of the ESM. Irrespective of the trigger condition, loan disbursements would have occurred in more than half of euro area member states, despite strict eligibility criteria. We only include instances where countries would qualify for a loan and where accepting one would be economically advantageous compared to market financing. Figure 3.a shows the size of the portfolio over time. Most loans would have been disbursed during the global financial crisis and the Covid-19 crisis, but some would have also been disbursed at other times. Despite the long maturity, the large loan size and the bunching of loan disbursements at specific times, the loan portfolio would not have exceeded 50% of the maximum budget that the ESM could potentially have dedicated to this instrument with existing resources – €250 billion, irrespective of the numerical trigger condition (see Figure 3.b).

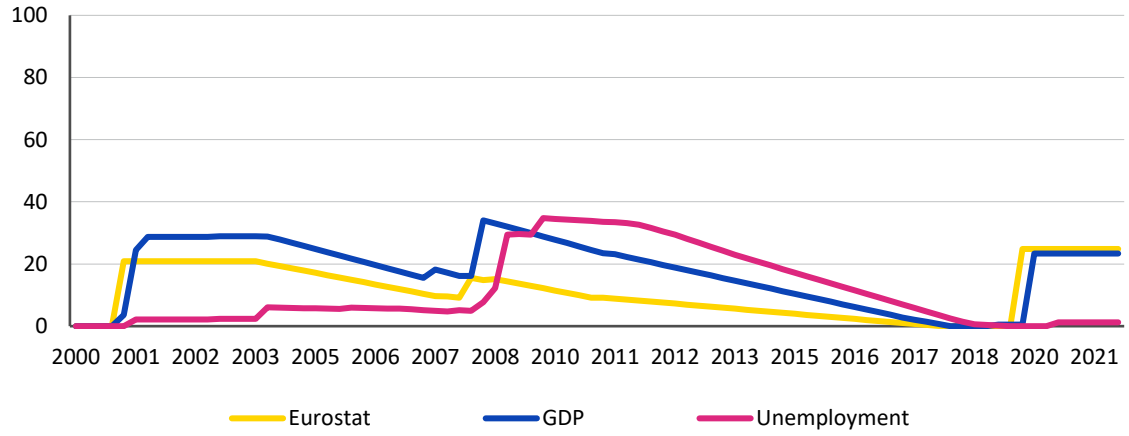
Figure 3.a
Loan disbursements by trigger indicator
(number)



Source: Authors' compilation

15. We interpolate the ESM 10-year rate for the period when it was not available before 2016 by taking the mean of the quarterly 10-year rates of Germany and France, the ESM's biggest guarantors, and computing the mean difference to the ESM 10-year rate across all quarters from 2016 onwards. We then add that difference to the mean of the German and French 10-year rates for quarters before 2016.

Figure 3.b
Size of loan portfolio by trigger indicator
(% of €250 billion)



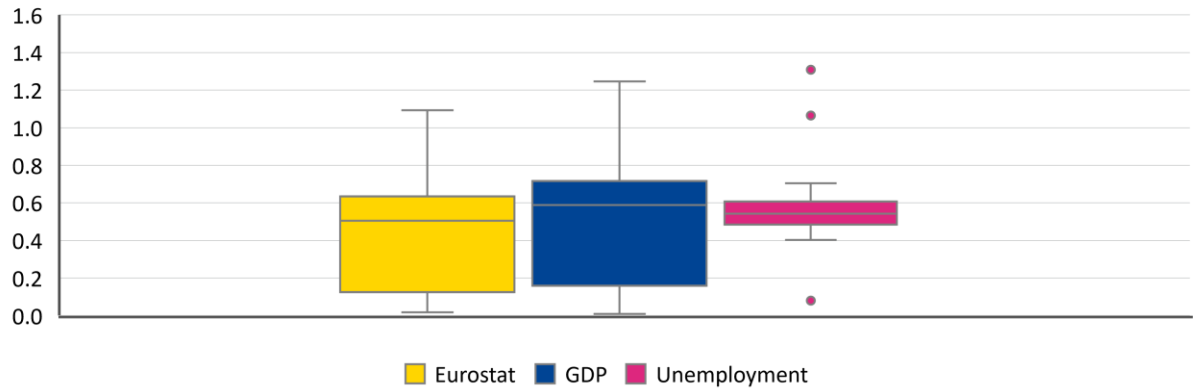
Source: Authors' compilation

Benchmarking the macroeconomic effects

The mechanical fiscal savings from the loans are of macroeconomic significance. 'Savings' refers to the difference between the lifetime interest payments of the loan and a bond of the same maturity, assuming the beneficiary country still has access to market financing and uses the loan proceeds to replace market financing of the same maturity (see Appendix A). For all numerical triggers, the median savings represented about 0.6% of GDP measured at the time of the loan disbursement, but could amount to more – reaching above 1% of GDP in some instances. Our results are consistent with the savings calculated for loans under the SURE instrument and past ESM programme loans, and the fiscal savings are proportional to the loan volume. Of course, there could be other difficult-to-quantify benefits including reduced dependency on volatile market funding, which could bolster market sentiment, and more flexible and/or cheaper stimulus, easing the trade-off between pro-cyclical austerity measures in recessions and future repayment burdens induced by the stimulus (see Bianchi et al., 2019, for a discussion on fiscal stimuli with default risks). In Appendix D, we consider the expansion of debt maturity if the beneficiary country uses the loan to replace short-term borrowing. As we do not propose to prescribe how the funds are used – apart from broad safeguards to prevent waste – a beneficiary country could also leave borrowing unchanged to finance increased spending or cuts in taxation.

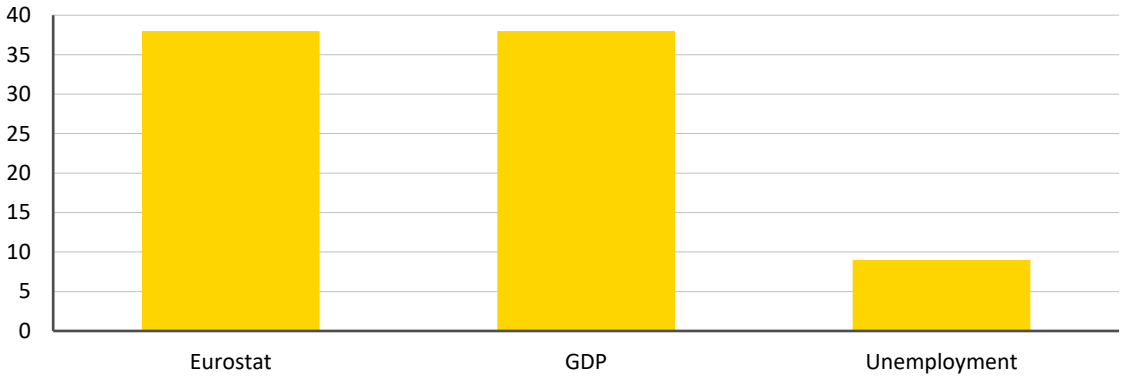
In some circumstances, and depending on assumptions, stability fund loans create larger economic benefits than grants from a straightforward insurance fund with a clawback mechanism. While grants provide greater economic benefits than loans, clawback mechanisms included in insurance funds imply that grants are financed by beneficiary country contributions over time. In our simulations, we compare the net present cost of the loans to the cost of participating in a straightforward insurance fund that provides grants of the same size as the loans. We assume that the grants are financed by constant contributions over a 15-year period, starting five years before any activation. This implies that when the loan is repaid, the sum of contributions would equal the full grant (see Appendix C for details). Figure 4.b shows that in 10% to 40% of cases where a loan was disbursed, grants from this type of insurance fund would have been economically disadvantageous relative to loans from our stability fund, given our specific assumptions. Loans are likely to entail a lower cost in more situations if insurance funds were to resort to market financing and mix grants and loans.

Figure 4.a
Distribution of savings by trigger indicator
(in % of GDP)



Source: Authors' compilation

Figure 4.b
Stability fund preferred to insurance fund
(% of disbursed loans)



Source: Authors' compilation

4. Conclusions

A euro area fiscal stabilisation capacity is one of the missing pieces in the euro area architecture, and filling that gap now is more important than ever. A fiscal stabilisation mechanism may be needed to cushion large shocks that common monetary policy and national fiscal policies cannot adequately address, either due to limited policy space or the asymmetric nature of the shock itself. The need has become more urgent because of stretched fiscal and monetary space two years into the pandemic, the increased chances of external shocks – not least because of the war in Ukraine and climate change, and the possibility of deeper future recessions.

Simply hoping that more cross-country risk sharing through other channels or replenished national fiscal buffers are sufficient to address the next major shock carries significant risks. Heidra et al. (2018) argue that completing the banking and capital markets union and building fiscal buffers are all more important and could obviate the need for a fiscal stabilisation capacity. Feld (2018) argues that fiscal consolidation at the national level and moves towards a political union should precede any steps towards a fiscal union. However, the banking and capital markets union remain incomplete, and it is not clear whether enhanced private risk-sharing alone would be sufficient to increase euro area resilience. Given existing record public debt levels and a need for substantial green investment, fiscal space will remain under pressure for the foreseeable future. Alcidi (2017) even suggests that more financial integration will increase the need for a euro area fiscal stabilisation capacity, which would imply a trade-off between private and public risk-sharing.

A loan-based fiscal stabilisation capacity has several advantages and is politically realistic. Most insurance and rainy-day fund proposals are economically sound. However, implementation in practice could prove difficult, given their complex design. We argue that a simple revolving fund, subject to caps, can fully address moral hazard-related concerns and, if hosted by the ESM, would not require additional taxpayer money or member state guarantees – making it not only politically realistic but also swiftly implementable. Contrary to the predictions of some papers (e.g., Gros, 2014), a loan-based fiscal stabilisation capacity does not necessarily entail smaller benefits than grant-based systems with experience-rating or clawback mechanisms. Finally, our proposed stability fund does not preclude the possibility of establishing other types of fiscal stabilisation functions in the future.

Our empirical simulations ignore any negative political stigma that could be associated with requesting loans from a fiscal stabilisation capacity. The existence of the ESM's Pandemic Crisis Support instrument has fostered financial stability during the pandemic, but despite the economic benefits, the instrument has not been requested. This suggests that greater efforts to counter political stigma may be needed.[16]

Our proposed stability fund could exist alongside the SURE instrument if the latter was made permanent. The SURE instrument provides loans to support short-term work schemes that safeguard employment in all EU Member States, thereby complementing our proposed stability fund. While its loan portfolio is restricted to €100 billion and now largely depleted, its lending capacity could be increased through higher guarantees or paid-in capital from the member states. By contrast, our proposed stability fund would focus on the euro area and fit within the ESM's existing lending capacity. Any permanent version of SURE could complement the stability fund.

There are several routes for future research. First, future research could identify novel and better trigger indicators, given the mixed results yielded by the benchmarking of our version of

16. Anecdotal evidence suggests that investors did not see any stigma associated with requesting ESM Pandemic Crisis Support loans; see https://www.esm.europa.eu/sites/default/files/migration_files/issuer_comment_-_european-stability-mechanism-esm_-_24apr20.pdf.

the unemployment-based trigger and the criticism that unemployment-based triggers have received. In particular, future research could explore whether combinations of high frequency indicators, including the unemployment rate, might more reliably identify exogenous shocks. Second, future research could also compare the costs of loans from a revolving fund to market financing more comprehensively and systematically, assessing the consistency of theoretical predictions with empirical evidence. Finally, and along similar lines, future research could assess the costs of insurance funds more broadly, thereby expanding upon our simplified assessment.

References

Adrian, T., Boyarchenko, N. and Giannone, D. (2019). Vulnerable Growth. American Economic Review, 109(4):1263–89.

Alcidi, C. (2017). Fiscal policy stabilisation and the financial cycle in the Euro area (No. 052). Directorate General Economic and Financial Affairs (DG ECFIN), European Commission.

Anas, J. and Ferrara, L. (2004). Detecting cyclical turning points: the ABCD approach and two probabilistic indicators. Journal of Business Cycle Measurement and Analysis, 2004(2), pp.193-225.

Arnold, M. N. G., Barkbu, M. B. B., Ture, H. E., et al. (2018). A central fiscal stabilisation capacity for the euro area. International Monetary Fund Staff Discussion Note 18/03.

Bartsch, E., Boivin, J., Fischer, S., et al. (2019). Dealing with the next downturn: From unconventional monetary policy to unprecedented policy coordination. Macro and Market Perspectives, 105, pp.1-16.

Basel Committee on Banking Supervision (2021). Climate-Related Risk Drivers and Their Transmission Channels, April 2021.Bank for International Settlements.

Beblavý, M. and Lenaerts, K. (2017). Stabilising the European Economic and Monetary Union: What to expect from a common unemployment benefits scheme?. CEPS Research Report.
Available at https://www.ceps.eu/ceps-publications/stabilising-european-economic-and-monetary-union-what-expect-common-unemployment/.

Beetsma, R, Cimadomo, J. and Van Spronsen, J. (2021). One Scheme Fits All: A Central Fiscal Capacity for the EMU Targeting Eurozone, National and Regional Shocks'. Centre for Economic Policy Research Discussion Paper No. 16829.

Beetsma, R. and A.L. Bovenberg. (2001). The Optimality of a Monetary Union without a Fiscal Union, Journal of Money, Credit, and Banking 33, 2, Part 1, 179-204.

Beetsma, R., Cima, S. and Cimadomo, J. (2018). A minimal moral hazard central stabilisation capacity for the EMU based on world trade. ECB Working Paper Series 2137.

Bénassy-Quéré, A., Brunnermeier, M.K., Enderlein, H., Farhi, E., Fratzscher, M., Fuest, C., Gourinchas, P.O., Martin,P., Pisani-Ferry, J., Rey, H. and Schnabel, I., (2018). How to reconcile risk sharing and market discipline in the euro area. VoxEU.org.
Available at https://voxeu.org/article/how-reconcile-risk-sharing-and-market-discipline-euro-area.

Bianchi, J., Ottonello, P. and Presno, I. (2019). Fiscal stimulus under sovereign risk. Working Paper No. 26307. National Bureau of Economic Research.

Bilbiie, F., Monacelli, T. and Perotti, R. (2021). Fiscal policy in Europe: controversies over rules, mutual insurance, and centralization. Journal of Economic Perspectives, 35(2), pp.77-100.

Carnot, N., Kizior, M. and Mourre, G. (2017). Fiscal stabilisation in the Euro-Area: A simulation exercise. Working Papers CEB 17-025, ULB -- Universite Libre de Bruxelles.

Charles, A., Darné, O. and Ferrara, L. (2018). Does the Great Recession imply the end of the Great Moderation? International evidence. Economic Inquiry, 56(2), pp.745-760.

Dolls, M. (2020). An Unemployment Re-Insurance Scheme for the Eurozone? Stabilizing and Redistributive Effects. CESifo Working Paper, No. 8219, Center for Economic Studies, ifo Institute (CESifo), Munich.

Dolls, M., Fuest, C., Heinemann, F. and Peichl, A., (2016). Reconciling insurance with market discipline: A blueprint for a European fiscal union. CESifo Economic Studies, 62(2), pp.210-231.

Dullien, S. (2015). Which fiscal capacity for the euro-area: Different cyclical transfer schemes in comparison. Berlin Working Papers on Money, Finance, Trade and Development No. 1502. Hochschule für Technik und Wirtschaft, Berlin.

Dullien, S., Fernández, J., López, M., Maass, G., del Prado, D. and von Weizsäcker, J., (2017). Fit for purpose: a German-Spanish proposal for a robust European Unemployment Insurance. Berlin: Friedrich Ebert Stiftung.

Enderlein, H., Guttenberg, L. and Spiess, J, (2013). Making One Size Fit All: Designing at Cyclical Adjustment Insurance Fund for the Eurozone. Jacques Delors Institut.

European Commission (2021). Report on the European instrument for Temporary Support to mitigate Unemployment Risks in an Emergency (SURE) following the Covid-19 outbreak pursuant to Article 14 of Council Regulation (EU) 2020/672.
Available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0148.

European Commission (2018). Impact Assessment. Accompanying the document. Proposal for a Regulation of the European Parliament and of the Council on the establishment of a European Investment Stabilisation Function. Commission Staff Working Document.
Available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018SC0297.

European Economic and Social Committee (2018). On a proposal for a regulation on the establishment of a European Investment Stabilisation Function. Opinion of the EESC.
Available at EUR-Lex - 52018AE3003 - EN - EUR-Lex (europa.eu).

Feld, L. (2018). Whither a fiscal capacity in EMU, VoxEU.org.
Available at https://voxeu.org/article/whither-fiscal-capacity-emu.

Furceri, D. and Zdzienicka, A. (2015).The euro area crisis: Need for a supranational fiscal risk sharing mechanism?. Open Economies Review, 26(4), pp.683-710.

Francová, O., Hitaj, E., Goossen, J., Kraemer, R., Lenarčič, A. and Palaiodimos, G. (2021). EU fiscal rules: reform considerations. Discussion Paper 17, European Stability Mechanism.

Gadea, M.D., Gómez-Loscos, A. and Pérez-Quirós, G. (2018). Great Moderation and Great Recession: From plain sailing to stormy seas?. International Economic Review, 59(4), pp.2297-2321.

Grazzini, J. and Massaro, D. (2021). Great volatility, great moderation and great moderation again. Review of Economic Dynamics, forthcoming.

Gros, D. (2014). A fiscal shock absorber for the Eurozone? Lessons from the economics of insurance. VoxEU.org.

Hagen, J.V. and Hammond, G.W. (1998). Regional insurance against asymmetric shocks: An empirical study for the European Community. The Manchester School, 66(3), pp.331-353.

Heijdra, M., Aarden, T., Hanson, J. and van Dijk, T., 2018. A more stable EMU does not require a central fiscal capacity. VoxEU.org.
Available at https://voxeu.org/article/more-stable-emu-does-not-require-central-fiscal-capacity.

Jensen, H., Petrella, I., Ravn, S.H. (2020). Leverage and deepening business-cycle skewness. American Economic Journal: Macroeconomics, 12(1), pp.245-81.

Kuehl, M., Theodoridis, K. and Castrillo, P. (2022). Amplitude of the EA Business Cycle since the GFC: Conditioned by Deep and Exceptional Crises. ESM internal note.

Lenarčič, A. and Korhonen, K. (2021). A case for a European rainy-day fund. ESM Discussion Paper, No. 5.

MacDougall, D. (1977). Report of the Study Group on the role of public finance in European integration. EUR OP.
Available at Report of the study group on the role of public finance in European integration – Publications Office of the EU (europa.eu).

Maduro, M., Martin, P., Piris, J.-C., Pisani-Ferry, J., Reichlin, L., Steinbach, A., Weder di Mauro, B., (2021). Revisiting the EU framework: Economic necessities and legal options. CEPR Policy Insight No 114.

Marjolin, R. (1975). Report of the Study Group" Economic and Monetary Union 1980" and Annex I. 8 March 1975.
Available at http://aei.pitt.edu/1009/1/monetary_study_group_1980.pdf.

Oksanen, Heikki (2016). Smoothing Asymmetric Shocks vs. Redistribution in the Euro Area: A Simple Proposa for Dealing with Mistrust in the Euro Area, CESifo Working Paper, No. 5817, Center for Economic Studies and ifo Institute (CESifo).

Padoa-Schioppa, T. (1987). Efficiency, stability and equity: a strategy for the evolution of the economic system of the European Community (Vol. 230).

Paprotny, D., Sebastian, A., Morales-Nápoles, O. (2018). Trends in flood losses in Europe over the past 150 years. Nature communications, 9(1), pp.1-12.

Plessen-Mátyás, K., Kaufmann, C. and von Landesberger, J. (2021). Funding behaviour of debt management offices and the ECB's Public Sector Purchase Programme. ECB Working Paper No. 2552.

Ruggeri Cannata, R. (2021). The Eurostat business cycle clock: A complete overview of the tool. Statistical Journal of the IAOS, 37(1), pp.309-323.

Appendix A: Net present costs of loans and bonds

To assess if requesting a loan from a revolving fund is economically advantageous for countries that still have market access, we compute the net present cost (NPC) of the loans and compare it to that of a market bond. Intuitively, the difference between both NPCs depends on both interest-differential savings and discounting. For instance, when the discounting rate is small, the fact that loan repayments occur earlier reduces the overall interest bill, making loans relatively more attractive. With high discounting rates, the fact that bonds are repaid at maturity renders bonds relatively more attractive.

With bond yield *y* and discount rate *r*, the net present costs of bonds (NPC_{bond}) to finance disbursement *D* in time *t=0* can be written as

$$NPC_{bond} = \sum_{t=1}^{T} \frac{y \times D}{(1+r)^t} + \frac{D}{(1+r)^T} \quad (1)$$

where *T* is the maturity and where the bond is issued in time *t=0*. Interest payments start in period *t=1*. The net present costs of loans (NPC_{loans}) is

$$NPC_{loan} = u \times D + \sum_{t=1}^{T} \frac{i}{(1+r)^t} \times (D - \max(0, t-G)) + \sum_{t=G}^{T} \frac{L}{(1+r)^t} \quad (2)$$

where *i* denotes the interest rate including fees, *u* denotes the upfront costs, and *L* are equally sized loan repayments that start after the grace period so that $\sum_{t=G}^{T} L = D$. To avoid politically unrealistic scenarios in the simulations, we further assume loans are only requested if the interest rate of the loan is below the yield of the bond. If $NPC_{Loan} > NPC_{Bond}$ the country will not request the loan and vice versa. It can be shown that the longer the grace period and the smaller the discount rate for a given, but positive, *y-i* differential, the more likely a country will request a loan. To assess the lifetime interest savings generated by these loans and presented above, we take the simple difference of equations 1 and 2 and abstract from discounting (Figure 4.a).

Appendix B: Data sources

Variable	Source	Time coverage	Country coverage	Comments / description
Quarterly GDP	Eurostat	Q1 2000—Q2 2021	Euro area	
Monthly unemployment	ECB (labour force survey indicators)	Q1 1997—Q2 2021	Euro area	Unemployment rate as defined by International Labour Organization guidelines (Ages 15 to 74)
Annual unemployment	World Bank, sourced from International Labour Organization statistics		Euro area	Yearly unemployment as defined by International Labour Organization guidelines (Ages 15 to 74)
Deficit	Eurostat	Q1 1980—Q2 2021	Euro area	Unadjusted, net lending to net borrowing, general government
10-year bond yield – euro area sovereigns	ECB (interest rate statistics)	Q1 2000 —Q2 2021	Euro area except Estonia	
10-year bond ESM	Bloomberg	Q1 2016 —Q2 2021	ESM	Interpolated for pre-2016 period
Total residual maturity	ECB (government finance statistics)	Q4 2009 —Q2 2021	Euro area except Estonia	Non-seasonally adjusted, general government
Eurostat business cycle clock indicator	Eurostat	Q1 2000 —Q2 2021	Euro area	
Excessive deficit procedure	European Commission	Q1 2000 —Q2 2021	Euro area	
Excessive imbalance procedure	European Commission	Q4 2011 —Q2 2021	Euro area	
Macroeconomic adjustment programme	European Commission	Q4 2011 —Q2 2021	Euro area	

Appendix C: Net present cost of grants from an insurance fund

For the purpose of our simulations, we assume a simplistic version of an insurance fund that provides mutualised grants. Any disbursements need to be fully financed by contributions of the beneficiary country over 15 years, implying a full clawback mechanism to avert moral hazard. We further assume that when grants are made, the country has made contributions for five years, and that the fund has accumulated sufficient resources pooled across countries to finance the disbursements, and thus, the need to resort to market borrowing does not arise. For simplicity, the size of the contributions remains constant over the 15-year period and is calibrated ex-ante so that the cumulative contributions over 15 years match the size of the grant.

The net present cost of the grants at time *t-5* is

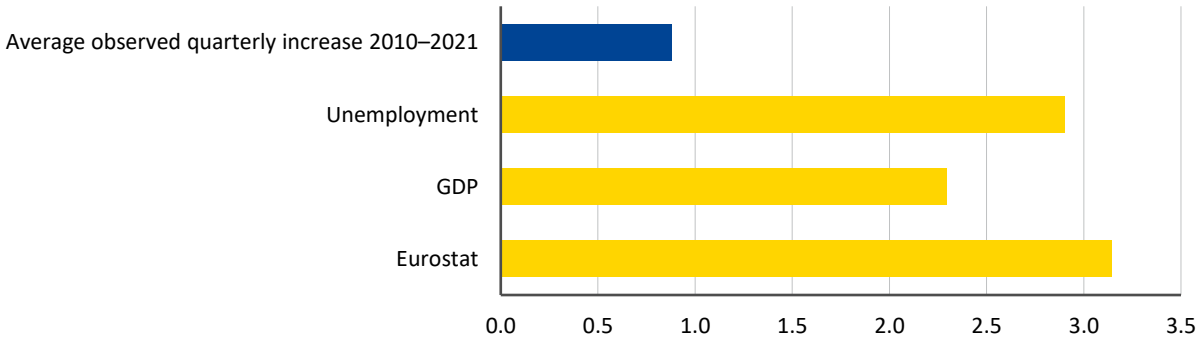
$$NPC_{grant} = \sum_{t=-5}^{T} \frac{A}{(1+r)^{t+5}} \quad (3)$$

where *r* is the discount rate set to the prevailing yield of 10-year bonds for each country at *t-5* and where *A* is the annual contribution so that $\sum_{t=-5}^{T} A = D$.

Appendix D: Supplementary empirical results

In a different scenario to the one presented in the main body of the paper, the beneficiary country can also use the loan to replace shorter-term debt to extend the maturity of existing debt. Debt management offices face a trade-off between reducing debt servicing costs and lengthening the maturity; we therefore now assume the debt management office replaces a hypothetical bond with a maturity equal to the average of total debt of the beneficiary country (where the average maturity is typically well below 10 years) with a loan from the stability fund. We show that, on average, the maturity would modestly increase under this strategy. According to Plessen-Mátyás et al. (2021), the average maturity of euro area debt has steadily increased since 2010, implying that the maturity-lengthening the effect declines over time.

Figure 5
Average increase in maturity
(% of total residual maturity)



Source: Authors' compilation