STABILISATION PROPERTIES OF A SURE-LIKE EUROPEAN UNEMPLOYMENT INSURANCE

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Abstract

To moderate the falls in production and income that affect certain states or regions, countries and monetary unions have risk-sharing mechanisms. These mechanisms work by stabilising household incomes such that fluctuations in production do not filter through to consumption. Almost all existing monetary unions are true insurance unions, except for the euro area. This entails lower resilience to economic shocks and, as demonstrated during the COVID-19 crisis, implies that the ability to respond to different shocks may differ between countries and, therefore, hinder economic convergence and homogeneous operation of the euro area. In this regard, the creation of a European Unemployment Insurance (EUI) scheme is often cited as an important step towards macroeconomic smoothing within the euro area that could help mitigate the economic and social impact of large economic shocks. In this paper, I propose an EUI scheme, with partial coverage, calibrated to the characteristics of the Temporary Support to Mitigate Unemployment Risks in an Emergency (SURE scheme) introduced during the COVID-19 crisis, and test its cyclical properties through simulation exercises, based on the payment and contribution flows in each country. This paper shows that such a transfer system with a relatively limited size could make a significant contribution to stabilising economic developments, cushioning part of the disruptions in times of crisis.

Keywords: macroeconomic stabilisation, monetary union, unemployment insurance, risk-sharing.

JEL classification: F45, E63, E62, E24.

Resumen

Para moderar las caídas en la producción y en los ingresos que afectan a determinados Estados o regiones, los países y las uniones monetarias disponen de mecanismos de reparto de riesgos. Estos mecanismos funcionan estabilizando las rentas de los hogares de forma que las fluctuaciones de la producción no se filtren en el consumo. Prácticamente, todas las uniones monetarias disponen de dichos mecanismos, excepto la zona euro, lo que supone una menor capacidad de resistencia a los *shocks* económicos. Como quedó demostrado en la crisis del COVID-19, esto implica que la capacidad de reacción ante distintos *shocks* puede diferir entre países y, por tanto, dificultar la convergencia económica y un funcionamiento homogéneo de la zona. En este sentido, la creación de un sistema de seguro de desempleo europeo se cita a menudo como un paso importante hacia la estabilización macroeconómica dentro de la zona euro que podría ayudar a mitigar el impacto económico y social de las grandes crisis económicas. En este trabajo se propone un sistema de seguro de desempleo, con cobertura parcial, ajustado a las características del Apoyo Temporal para Mitigar los Riesgos de Desempleo en una Emergencia (SURE, por sus siglas en inglés), introducido durante la crisis del COVID-19, y se evalúan sus propiedades cíclicas mediante ejercicios de simulación. Este trabajo muestra cómo un sistema de transferencias de este tipo, con un tamaño relativamente limitado, podría contribuir significativamente a estabilizar la economía, amortiguando parte de las perturbaciones en tiempos de crisis.

Palabras clave: estabilización macroeconómica, unión monetaria, seguro de desempleo, reparto de riesgos.

Códigos JEL: F45, E63, E62, E24.

1 Introduction

To moderate the falls in production and income that affect certain states or regions, countries and monetary unions have risk sharing mechanisms. These mechanisms work by stabilizing household incomes in such a way that fluctuations in production do not filter into consumption. On the one hand, the agents affected by the shocks can obtain labour or financial income from other states or regions where the effect is smaller (income channel), or they can smooth their consumption or investment through access to credit (credit channel). On the other hand, among mechanisms of a public nature, fiscal transfers from a central or federal budget can also act as buffers. In the case of other federal systems, such as that of the United States, it is estimated that this type of transfers, materialized through different federal programs, have effectively mitigated the impact of idiosyncratic shocks in the different states or regions (*Burriel et al.*, 2020). However, the European Monetary Union (EMU) lacks automatic fiscal stabilizers that allow risk sharing among member states (*Banco de España*, 2017).

As has been demonstrated in the Covid-19 crisis, this implies that the ability to react to different shocks may differ between countries and, therefore, hinder economic convergence and a homogeneous operation of the area. Enhanced risk-sharing in the euro area is also backed by empirical evidence that suggests a more limited absorption of country-specific shocks in the euro area compared to the United States, among other factors, also due to the lack of a federal budget (see, e.g. *Cimadomo et al.*, 2018). Thus, a EUI has been seen by many observers and policy makers as a necessary instrument to strengthen the architecture of the euro area.

In the aftermath of the euro area crisis, the European Commission started to argue that EMU needs both a fully-fledged Banking Union and automatic fiscal stabilisers. The Five Presidents' Report published in 2015 called for the introduction of a supranational automatic stabiliser and in its Reflection Paper on the deepening of the Economic and Monetary Union of 31 May 2017, the European Commission referred to a European unemployment reinsurance scheme (EUIS) as a possible instrument that would provide a stabilisation function. In parallel, a number of Member States have expressed support for establishing an unemployment (re)insurance scheme at European level. However, implementing a European unemployment insurance may not be politically feasible and no progress has been made regarding the implementation of these proposals. European countries differ in their unemployment rates not only because they are, at a given point in time, in different phases of the business cycle, but also because they have structurally different labour market institutions. As a consequence, long-term averages of unemployment rates vary substantially across Europe. The differences in labour market institutions may imply very different optimal benefit schemes, making it potentially difficult to agree on one common system.

In this context, in April 2020 the European Commission proposed the creation of a European instrument for temporary Support to mitigate Unemployment Risks in an Emergency (SURE) to address the drastic increase in temporary unemployment related to the Covid-19 crisis and mitigate its negative economic consequences. SURE is a reinsurance system of the national unemployment insurance based on the granting of loans. In a sense, SURE can be seen as a complement to 'normal' unemployment insurance: it adds 'job insurance' in the context of a specific temporary emergency,

created by a large-scale and exogenous disaster. It was presented as a form of temporary and emergency implementation of a "European unemployment re-insurance system" and can be seen as a first step towards a permanent EUI.

This paper quantifies the benefits for the EMU derived from setting up a EUI scheme with a size (per decade) and operation similar to those of SURE. Thus, it assess the stabilising effects of a EUI in a realistic scenario where the EUI acts as an addition to national unemployment insurance schemes without replacing them and only kicks in during severe recessions and not in normal times. In particular, it uses the NiGEM macroeconometric model to perform counterfactual simulations to measure the impact of a EUI on consumption, GDP and unemployment in eleven euro area Member States covering the period 2000Q1 to 2021Q4. The analysis provides support for this European policy, which can make a significant contribution to stabilising economic developments, cushioning part of the disturbances in times of crisis. It could both lower the amplitude of national cycles and increase the synchronisation of cycles across member countries.

While the potential risk-sharing gains that can be achieved in the Eurozone by insuring severe shocks have been shown already by a number of studies (including some simulating a EUIS with NiGEM), the paper contributes to the literature by assesing whether stabilisation results from previous studies also remain robust in the wake of shocks like the Covid pandemic and by linking the SURE debate to the EUIS debate. The remainder of this paper is structured as follows. It begins with a discussion of the rationale for a supranational automatic stabilisation mechanism and the role of a European Unemployment (re)Insurance on this. Section 3 introduces the SURE instrument and the role of Short-time work schemes. Section 4 delves into the designing and modelling of a EUI, outlining general concepts and policy choices. Section 5 outlines the specific design, scenarios and trigger mechanisms examined in this paper and presents the contributions and pay-outs derived from them. Section 6 presents the results on macroeconomic stabilisation. Finally, Section 7 gives the conclusions.

2 A EUIS as an automatic stabiliser

The financial turbulence and severe economic downturn of the late 2000s and early 2010s highlighted the insufficient ability of available instruments to absorb large economic shocks in the euro area, including in Member States with low levels of public debt and seemingly sound public finances. In the euro area, Member States no longer have the exchange rate and a national monetary policy to use as tools to counter the effects of asymmetric shocks. Only fiscal policy is 'decentralised' and in principle can respond to country-specific shocks. This arrangement appears viable for normal times but it is confronted with critical problems whenever large economic disruptions arise.

Market failure is the main reason why Monetary Unions can benefit from stabilization tools (*Goodhart and Smith*, 1993; *Allard et al.*, 2013). One area where this has become especially evident is labour: with monetary policy and exchange rates absent from the EMU countries' toolboxes, labour mobility and wage flexibility should play a role, at least in theory, as important mechanisms for absorbing asymmetric shocks (*Arpaia et al.*, 2016). However, the European experience is quite different. Although recent research shows that labour mobility has increased in times of crisis, the

rate is still much lower in Europe than in the United States (*Alcidi and Thirion*, 2016). Another reason, which became especially evident during the financial crisis, is current account imbalances. *Pasimeni* (2015) argues that the EMU is characterized by an inherent deflationary bias, resulting from the absence of a supranational tool to guide demand and the fact that adjustments at the national level cannot happen through deflationary processes alone. While a banking union can help with some of these problems, an automatic stabiliser is needed. The last argument concerns spillover effects. When a country in a monetary union experiences a shock, this creates a negative spillover effect to other economies (*Majocchi and Rey*, 1993; *Frankel and Rose*, 1998; *Kalemli-Ozcan et al.*, 2003; *Allard et al.*, 2013).

These questions draw attention to the EMU architecture and the idea of establishing a common stabilization function in the EMU, recognized by the Four and Five Presidents' Reports" (2012; 2015) and more recently by the *European Fiscal Board* (2018). Nevertheless, the debate about such supranational automatic stabilizers for Europe is not new. It dates back to the 1970s (*Marjolin*, 1975; *MacDougall*, 1977) and it was revived in the early 1990s, when consensus was reached on the need for European financial stability (*Padoa-Schioppa*, 1987; *Emerson*, 1992). Over the past few decades, a variety of potential stabilisers have been examined. *Beblavý et al.* (2015) presents an overview of these mechanisms, including regional policy, public investment, debt management and taxation. For example, a regional policy proposal can be found in the report by *MacDougall* (1977). *MacDougall* (1977) developed a cyclical of cyclical grants to local or regional governments and *Padoa-Schioppa* (1987) proposed a similar idea. Related work by *Drèze et al.* (2014) focuses on public investment. Investments in social housing, renewable energy and transportation would be valuable to lagging regions. Another proposal has been made by *Enderlein et al.* (2013). These authors introduce the idea of a European debt agency that could issue its own bonds. Similar proposals have been discussed by *De Grauwe and Moesen* (2009), *Allard et al.* (2013) and *Pisani-Ferry et al.* (2013). *Enderlein et al.* (2013) further discussed the idea of setting up a European fund. Finally, several proposals for a common European unemployment insurance system have been put forward. One of the earliest proposals dates back to 1975, when the report by Marjolin et al. *Marjolin* (1975) introduced the EUIS as a tool for fiscal policy, stabilization and redistribution. This report paved the way for later work, such as that by *Italianer and Vanheukelen* (1993), *Dullien* (2013, 2014), *Beblavý and Maselli* (2014), *Dolls et al.* (2014), *Jara and Sutherland* (2014), *Beblavý et al.* (2015) and more recently by *Dullien et al.* (2017) and *Dolls* (2020).

Certainly, one of the most studied and promising mechanisms proposed so far as a supranational automatic stabiliser, both at the academic and institutional level, is a European unemployment insurance scheme (EUIS). Since stabilization is achieved automatically (i.e. net transfers from the scheme that react to national unemployment rate), the scheme has the capacity to offset fluctuations in a country's business cycle, including both expansion periods and recessions, supposedly working in a countercyclical way. This scheme may be particularly relevant to the EMU, where market failures (i.e., nominal price and wage rigidity) and low labour mobility impose an adjustment burden on workers. Since EUIS is based on unemployment, it has the advantage that unemployment benefits are counter-cyclical and highly sensitive to shocks (unemployment benefits are automatic and rapid, giving the unemployed a boost to support consumption spending). Unemployment benefits also have a high multiplier effect (*Zandi*, 2008; *Vroman*, 2010). In addition, the unemployment rate

is easily measured because it is regularly observed and monitored using survey and administrative data. Finally, it can be designed to mainly target large and possibly asymmetric shocks, which could prevent or, at least, cushion part of the shocks such as the recent Great Recession.

Strengthening national schemes by expanding their coverage and/or generosity is a particularly important channel through which stability maybe achieved. However, improving the existing national schemes would not be sufficient to achieve the same stabilisation results as a EUIS as it ignores the other two channels: NUIS cannot use a cross-country shock adjustment and may face financial or institutional constraints (EUIS can issue debt in most cases). Moreover, improving NUIS could be politically and financially difficult without a common safety net. Finally, such improvement must go hand in hand with common minimum requirements, in order to avoid Member States curtailing their budget-saving plans.

This paper contributes to the literature on measuring the stabilisation capacity of a European unemployment insurance scheme. The measurement approach, however, may affect the estimated impact of the scheme (*Beblavý et al.*, 2015). In this regard, a first issue is whether considering the impact of the insurance scheme over the business cycle or during a recession. The stabilisation capacity of the scheme generally is larger in the latter case. A second issue is whether to use the long-term GDP trend as a benchmark to weigh the stabilisation impact of the scheme against or whether past GDP is more suitable. Estimates usually are larger when past GDP is used. Another key question is whether to focus on the average country or on the country most strongly hit. *Dullien* (2013) uses the long-term GDP trend and focuses on the stabilisation impact at times of recession. He obtains an effect of 11% for the average country when the net balance of payments is used as a measure (vis- a-vis the change in aggregate income in the country). *Italianer and Vanheukelen* (1993) used the same approach in their paper and arrive at an impact of 20% across Europe. *Dolls et al.* (2014) have also used a similar approach, but rely on the net sum of contributions paid and benefits received, divided by the sum of individuals' changes in employment income. Interestingly, these authors detected a stabilisation impact of 23–31% for Greece, Ireland, Italy, Spain and Portugal in the recent crises. *Beblavý and Maselli* (2014) and *Beblavý et al.* (2015) have criticised this approach, because it neglects fiscal multiplier effects. Nevertheless, the stabilisation impact reported in the literature seems to be important. Complementing this literature, this paper shows the potential risk-sharing gains that can be achieved in the Eurozone by insuring severe shocks.

3 The SURE instrument

The European Union (EU) reacted swiftly and with a wide array of instruments to the economic crisis created by the global spread of COVID-19 (*Cuadro Sáez et al.*, 2020; *Alonso Soto et al.*, 2021). SURE was a novel mechanism created to cover the sudden increase in public spending devoted to preserve employment through short-time work (STW) schemes (ERTEs in Spain) and other similar mechanisms for self-employed workers. The instrument's total envelope amounted to €100 billion. If a member state experienced a sudden and severe increase in actual and planned public expenditure for the preservation of employment because of its response to the COVID-19

pandemic, it could request financial assistance under the SURE instrument to cover part of this additional expenditure.

Although SURE was a temporary instrument (it concluded in December 2022), this initiative made operational in the short term a previous proposal from the Commission, referring to a European unemployment reinsurance system, with similar characteristics but of a permanent nature. Therefore, SURE is a reinsurance system of the national unemployment insurance based on the granting of loans. Its operation is similar to that of the federal account (Trust Fund) in the United States federal unemployment system. In this system, states accumulate funds in individual accounts through social contributions, but if they run out of funds (as happened in the vast majority of states in the financial crisis), there is a federal account that can make loans to state accounts. However, in the US, the federal account is also responsible for transferring unemployment benefits in the event of a crisis, both automatically and discretionally (*Albrizio et al.*, 2017).

While SURE was introduced in the context of unemployment reinsurance, probably the best characterisation of SURE is that it is a job insurance scheme (*Fernandes and Vandenbroucke*, 2020). It is a safety net for jobs, but not for the unemployed. The distinction is meaningful. In any existing unemployment insurance scheme, cash (and not a loan) is received by the unemployed individual. This is not the case with SURE. Thus, the missing element remains the EU capacity to top up national unemployment insurance funds in the circumstances of a recession. While the rise of joblessness can be massive, related funding will continue to rely entirely on national resources (*Andor*, 2020). Nevertheless, to the extent that SURE helps to lower the number of actual unemployed, the national unemployment benefit schemes will cope better.

SURE did not only bring a new budgetary tool to the EU but also a new way of raising and providing resources. It did not require any upfront cash contributions from member states. To back the lending scheme, member states committed irrevocable and callable guarantees worth €25 billion to the EU budget, with each guarantee calculated on the basis of their respective share of EU gross national income. Such a system ensured a high credit rating, enabling the European Commission to contract borrowings on the financial markets at favourable conditions, with the purpose of lending them to the member state requesting financial assistance. In order to avoid excessive concentration, a €60 billion limit on the total exposure to the three Member States representing the largest share of the loans was imposed.[1] The conditions of the loans, in terms of interest rate or maturity period, were set on a case-by-case basis.

The size of the instrument is key for stabilisation but there is one limit to SURE's firepower: the total amount and the aforementioned €60 billion limit in the share of loans granted to the three Member States representing the largest share. An analysis of spending on unemployment benefits provides some indication to assess this figure. Over the last decade, spending on unemployment benefits reached a record level of €193 billion in 2010 for the entire EU-27. In 2017, it stood at €174 billion. If we only consider Spain and Italy, their expenditure on unemployment benefits was equal to €58 billion in 2010 and fell to €49 billion in 2017.[2] These figures show that, although the

[1] See Article 9 of the SURE regulation in https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32020R0672

[2] EUROSTAT, ESSPROS data

amount is significant, might not be enough to cover all unemployement benefits, particularly for some countries, but this is not the main objective of the instrument.

4 The simulated EUIS

This paper analyses stabilising and budgetary effects of an EUIS intended to provide counter-cyclical stabilization in case of large labour market shocks and designed in a way that closely mimics the SURE instrument. In particular, it asses the stabilising effects of a EUI under three (politically feasible) scenarios where the EUI acts as an addition to national unemployment insurance schemes without replacing them and only kicks in during severe recessions and not in normal times. I follow a macro-econometric approach to perform counterfactual simulations to measure the impact of such an EUIS on consumption, GDP and unemployment in eleven euro area Member States covering the period 2000Q1 to 2021Q4. In this section, the characteristics of the simulated re-insurance as well as the modelling design are presented in more detail.[3]

4.1 Design and characteristics

The simulated EUIS in this paper incorporates the following elements:

- Re-insurance scheme activated according to a pre-defined, unemployment and/or GDP- based trigger;
- partial coverage of negative shocks affecting national unemployment agencies, with support proportioned to the size of the shock, and a cap on cumulative balance at the country level;
- it is based on loans. The repayment of these loans is set as a percentage of the total outstanding debt each year, without interest.
- as in SURE, these loans are financed with debt issued by the EU.

These characteristics follow an insurance logic. The EUIS would cover only parts of the shocks, those causing sudden and severe rises in the unemployment rate, through the reinsurance of national unemployment benefits at a time when pressure on public finances is at the highest. Stabilizing the rest of the shocks is left at the country level. The objective is to finance occasionally high pay-outs from the scheme through loans. These loans are financed by EU debt, but it does not accumulate assets in good times: as long as the pay-offs are not activated by crisis-hit countries, the scheme is inactive and its assets do not increase.

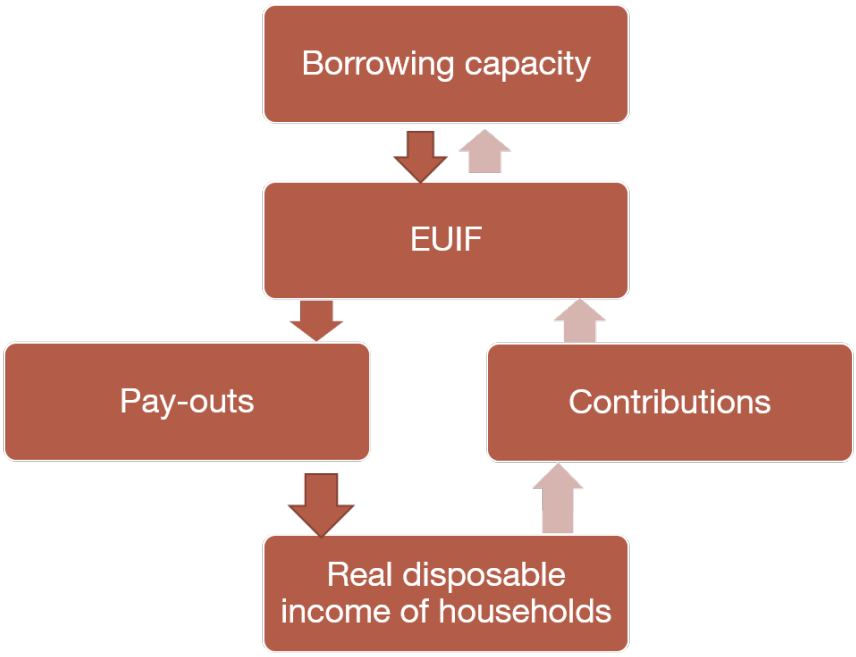
The re-insurance scheme simulated in this paper has attractive features compared to a genuine unemployment insurance scheme. In a genuine variant of the euro area unemployment insurance scheme, the central fund pays unemployment benefits directly and continuously to all eligible euro

[3] See Annex A for a description on the main challenges related to the implementation of an EUBS, together with some solutions proposed in the literature.

area unemployed workers. Since such a scheme would be active in all periods, not restricted to large shocks, potential moral hazard would be higher. Such a scheme would also likely require further harmonisation of heterogeneous national unemployment insurance systems in terms of duration, eligibility and replacement ratios (*Dolls et al.*, 2014). In the absence of further harmonisation, a genuine system would have to be aligned to the lowest common denominator in terms of unemployment insurance, limiting its stabilisation capacity. On the contrary, an unemployment re-insurance scheme can succeed even with limited convergence, as it only re-insures national agencies according to a pre-defined transfer amount.

Figure 1 presents a basic graphical representation of the EUIS simulated in this paper. There is a borrowing capacity at the supranational level to create a European fund which makes transfers to countries through loans that have to be repaid. These pay-outs and repayment of loans have an impact on households' real disposable income. Since the model takes into account interactions between economies, other euro area countries benefit indirectly from transfers paid to another country through foreign demand.

Figure 1: EUI scheme in this paper



Source: Author's own elaboration

4.2 Scenarios

In this paper the EUIS is simulated under three different scenarios (Table 1). The simulated scenario has important consequences not only on the size and cost of the EUI but also on its stabilisation properties as well as on the long-term economic performance of participant countries. In the first contrafactual scenario, national STW schemes would have not been in place. This means that a

large share of workers in STW would have become unemployed and covered by the EUIS. As a result a contrafactual unemployment rate is generated assuming that some of dismissed workers become inactive (Figure 3).[4] In the second contrafactual scenario, national STW schemes are in place and the EUI covers both short-term unemployed and workers in STW. In this scenario, the number of eligible unemployed is slightly larger (Figure 2) and EUI acts as the SURE instrument covering all workers in STW schemes (in addition to the short-term unemployed). Finally, in scenario 3, as in most studies in the literature, the EUI only covers short-term unemployed.[5]

In normal times and in countries with small or no STW schemes in place, both the number of eligible unemployed and the unemployment rate are similar in all three scenarios. However, at the onset of the 2008-2009 financial crisis in those countries where STW schemes already represented a standard tool to preserve employment during a temporary shortfall of demand (i.e Germany, Italy and France) and during the COVID-19 crisis in all Member States, the number of eligible unemployed and the unemployment rate differ significantly by scenario. This is particularly the case during the first quarters of the COVID-19 crisis where the number of people in short-time work schemes reached an historical record (Figure 2).

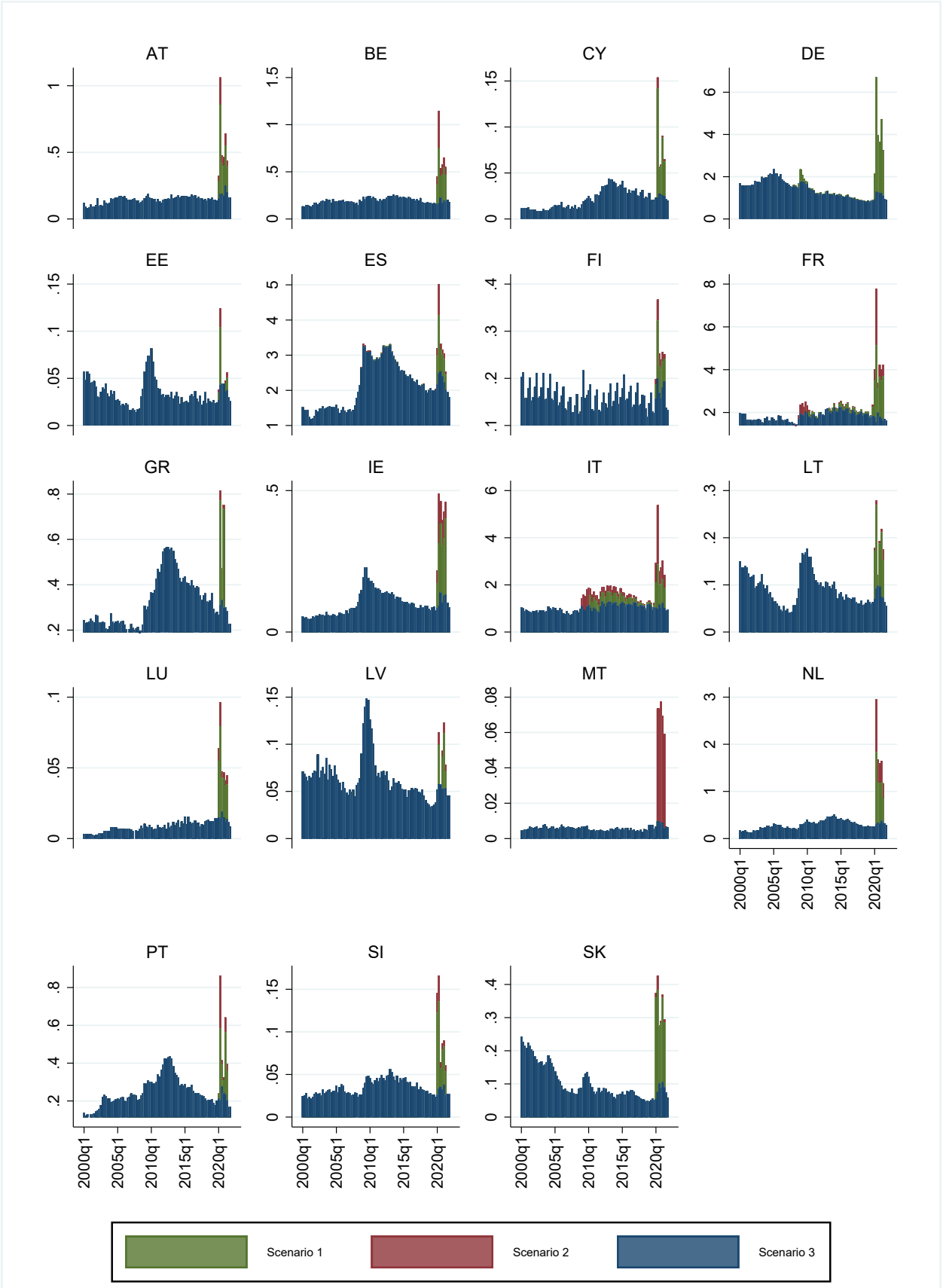
Table 1: Scenarios simulated in this paper

	National STW in place?	**Coverage**	**New unemployment rate?**
Scenario 1	No	Short-term unemployed + new unemployed from STW	Yes
Scenario 2	Yes	Short-term unemployed + workers in STW	No
Scenario 3	Yes	only short-term unemployed	No

[4]The unemployment rate in absence of STW schemes assumes that some of dismissed workers become inactive and is based on quarterly transition rates from unemployment into inactivity. For Germany, transitions rates are not available; instead, transitions rates of Denmark are used, as the two countries have similar inactivity rates.

[5]Scenario 2 is considered the baseline scenario and all results presented in the paper refers to this scenario (unless otherwise stated). Results for scenarios 1 and 3 are available in online annex.

Figure 2: Number of short-term unemployed eligible by scenario (Millions)



Source: Author's own calculations based on Eurostat

Figure 3: Unemployment rate by scenario (%)

Source: Author's own calculations based on Eurostat

4.3 Triggering

One of the most critical design options of a EUIS is the trigger mechanism as it determines the frequency of the transfers and the size and power of the EUIS. It is is composed of a trigger (or indicator) variable and a threshold. The trigger variable measures the magnitude of fluctuations in employment. It enters the activation rule determining under which circumstances a pay-out from the stabilization fund is triggered. Most proposals rely on indicators such as the unemployment rate or the short-term unemployment rate. A threshold value in the activation rule stipulates how large the size of the shock must be for a pay-out to be triggered. It can either apply to the quarter-on-quarter change in the trigger variable or to the deviation from its long-term moving average.

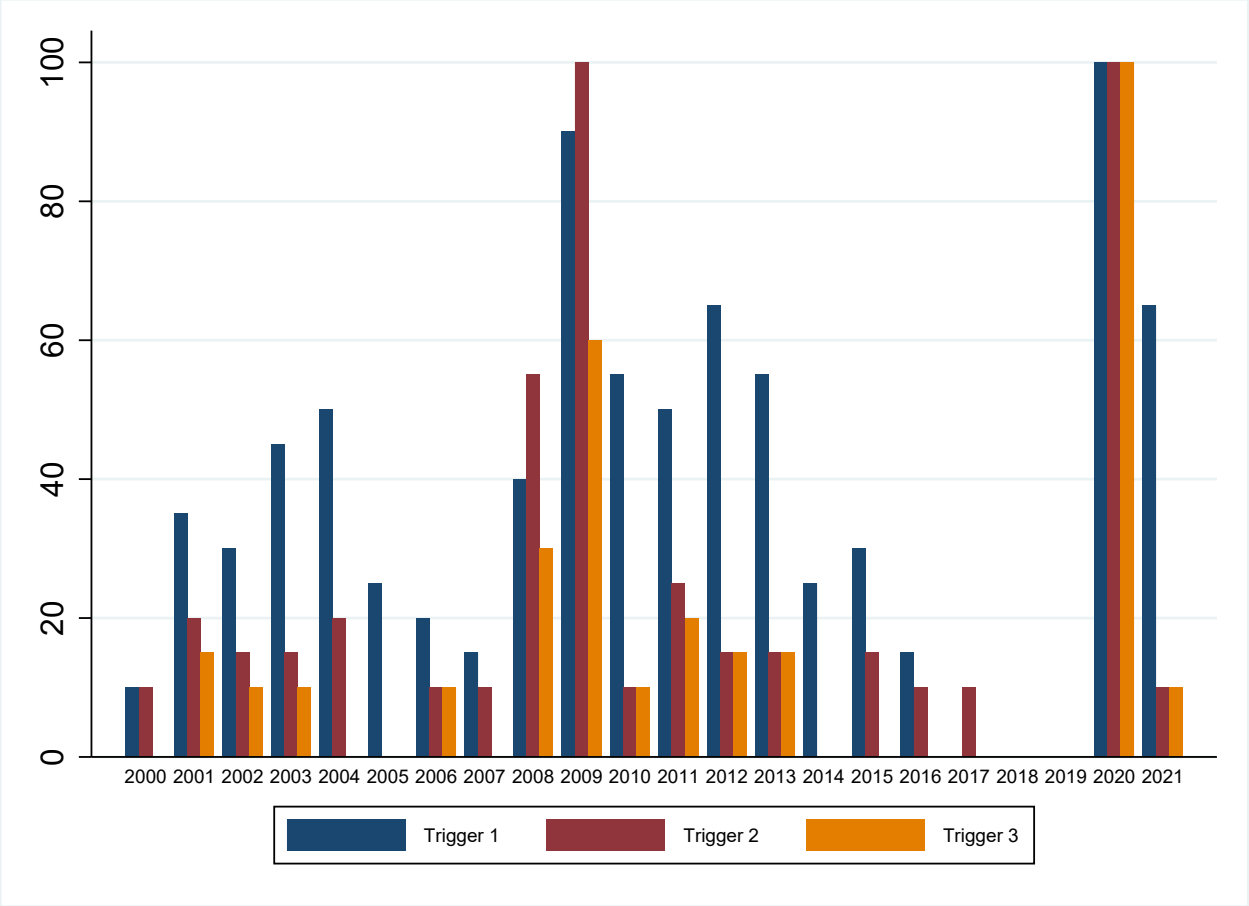
In this paper, for the underlying indicator variable entering the activation and the contribution rule, two potential cyclical indicators are considered: the unemployment rate and the Gross Domestic Product. The reason is that both capture well the impact of the shock by focusing on the distance from a certain level. The downside of this choice is the difficulty of setting a benchmark which is, to a certain extent, discretionary. For pay-outs to be triggered, threshold values in the activation rule of 0.25 points for the quarter-on-quarter increase in the unemployment rate and 1 percentage point for the quarter-on-quarter drop in GDP are considered (Table 2).

Table 2: Trigger mechanisms in this paper

	Trigger variable	**Activation rule**
Trigger 1	Unemployment rate	Double condition: quarter-on-quarter increase in the unumployment rate exceeds 0.25 p.p. and unemployment rate above its 5-year moving average.
Trigger 2	GDP growth	Quarter-on-quarter drop in GDP exceeds 1p.p.
Trigger 3	Unemployment rate and GDP growth	Trigger 1 + trigger 2

While stronger counter-cyclical effects might be achieved by focusing on the change in the unemployment rate or GDP only, the double (triple) conditions considered in this paper, especially since they incorporate a threshold, ensure with a great degree of assurance that the Member State is indeed confronted with a large shock with a temporary and country specific element. By adding the requirement that the level of the unemployment rate must be above its five-year moving average, allow support to be less often distributed and not to provide support when the economic shock is deemed minor. This condition is needed to put countries on par, irrespective of their permanent (structural) level of unemployment. Overall, the double condition is intended to ensure that contributions (transfers) are only paid in upturns (downturns) so that pro-cyclical effects are to be avoided to the greatest possible extent. Regarding the contribution rule, it is restrictive enough to avoid pro-cyclical effects as member states are not being forced to make contribution payments in recessions that are not severe enough to trigger a transfer from the re-insurance.

Figure 4: Share of EA countries meeting the trigger condition (%)



Source: Author's own calculations based on Eurostat

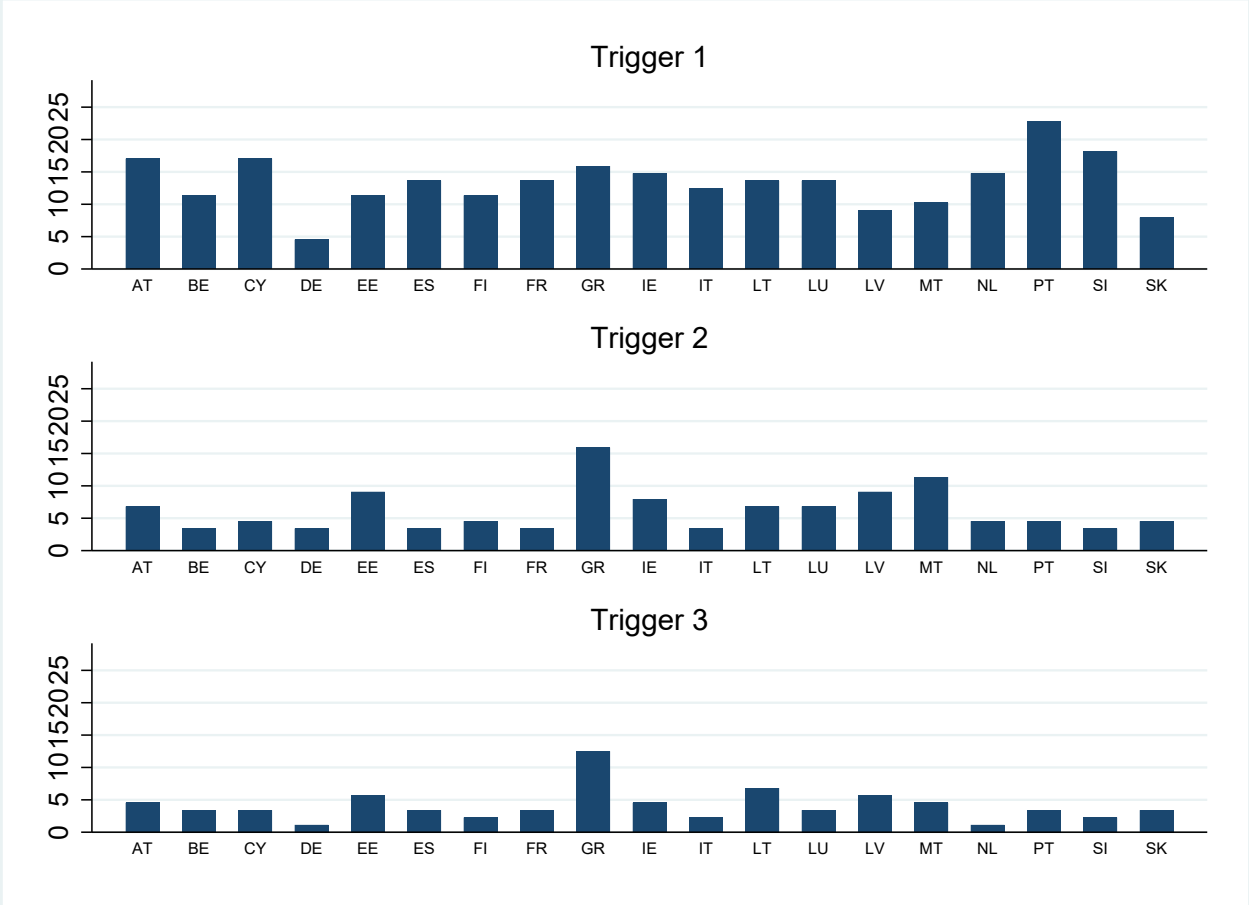
The frequency of activation depends both on the scenario and, particularly, on the trigger mechanism. Figure 4 shows the share of EA countries that would have met the trigger condition for the three trigger mechanisms proposed in this paper, over the period 2000-2021 and under three different scenarios. In particular, during this period, with trigger 1 the re-insurance would have been activated most often in the period 2008–2013 and, to a lower degree, in the early 2000s, with four peaks of support (covering over 60% of the Member States) in 2009, 2012, 2020 and 2021 under scenarios 1 and 2. On the other hand, triggers 2 and 3 are more selective and leave the adjustment to larger shocks under the sole responsibility of Member States and therefore EUIS provides support less often. Under scenarios 1 and 2, EUIS would have provided support for more than 20% of EA member states only in 2008, 2009, 2011 and 2020 with trigger 2 and 3. The double trigger condition in trigger 3 makes it even more selective, triggering payouts to only 60% of EA member States at the peak of the financial crisis (2009). Nevertheless, all three triggers activate payouts to a large share of EA countries when it is really needed (2009 and 2020).

While before the COVID-19 crisis, the scenario barely affects the share of countries receiving support by trigger, this is not the case during the pandemic due to the extended use of STW. In particular, the use of STW support reached its peak during the first wave of the COVID-19 crisis in the second quarter of 2020, affecting triggers 1 and 3 as the unemployment rate is used as indicator variable. As a result, in 2020, in scenarios 1 and 2, where alternative unemployment rates are used,

EUIS covers over 90% of EA countries regardless of the trigger used, while in scenario 3 less than 40% of countries would have received support with triggers 1 and 3 as the use of STW prevented a large increase in the actual unemployment rate.

Figure 5 shows the share of quarters each country would have met the trigger conditions for payouts over the period 2000–2021. On average, the share of activations would be 13% using the unemployment rate (trigger 1), 6% using the GDP (trigger 2) and 4% if the double trigger (trigger3) is used, indicating that the overall number of activations becomes substantially smaller if the GDP or the double trigger is used in the activation rule. Portugal would have been the member state with the highest share of activations (23%) if the overall unemployment rate had been used as indicator variable, while Greece would have met the conditions for pay-outs most often if the GDP (16%) or the double trigger had been used (12.5%). Figure 5 also shows that for several member states the indicator variable selected would have led to some notable differences with regard to the number of activations. For instance, Spain would have met the condition for pay-outs 14% of the quarters if the overall unemployment rate had been used as indicator variable and only in 3.4% of them if GDP or the double trigger had been employed. At this point, it should be noted that for payouts to be triggered, it is not only necessary to meet the requirements of the trigger mechanism, but also to comply with the loan limit (20 billion euros), which limits the number (and size) of payouts that countries can received, particularly for large countries and when the shocks are relatively close together.

Figure 5: Frequency of activation by country (%)



Source: Author's own calculations based on Eurostat

4.4 Financing and size

In the proposed scheme, countries spend on unemployment benefits which is offset by extra income received by the EUI fund. The size of the pay-out (PO) is a function of the increase in the number of unemployed, so that the amount of the support is linked to the severity of the shock. When activated, the scheme pays out to the Member State an amount equivalent to its quarter-on-quarter increase in unemployment benefit expenditures, which is proxied by the nominal compensation per employee (NC) in country i and time t times the historical average replacement rate (RR) of country i times the number of new (short-term) unemployed (Nunemployed) in country i and quarter t.

$$PO_{it} = NC_{it} \times RR_i \times Nunemployed_{it} \tag{1}$$

Such pay-outs can, in exceptional circumstances, lead to high transfers. This could prove problematic for two reasons. First, some countries might run high and growing positive positions towards the fund (i.e. they receive big pay-outs for several years), which could prove politically difficult. Second, there could be some years when unemployment agencies could have difficulties absorbing the received transfers. For these reasons, as in SURE, each country will only be able to access to the EUIF to request a maximum accumulated amount, which in the reference system is 20 billion euros.[6] This helps preventing balances to build up to excessively high levels. It also to some extent limits one-time high pay-outs, although they still occur in some cases.

$$P_{it} = PR_{it} \times OD_{it} \tag{2}$$

The simulated scheme is based on loans, which are repaid when short-term unemployment is falling and the trigger condition is not met. The repayment of these loans (P) is set as a percentage (PR) of the total outstanding debt (OD) each quarter, without interests. In the reference system the repayment term is 10 years, which is equivalent to a quarterly payment of 2.5% of the outstanding debt. As in SURE, these loans are financed by a supranational entity (EU) that issues debt, allowing the individual risk of the Member States to be shared among them. The EU or euro area institutions have a much greater borrowing capacity than most individual governments, as it has been shown in the success of the European Commission emissions. of 'SURE social bonds', as well as of 'eurobonds' to finance NGEU programmes. Furthermore, from a modelling perspective, the capacity of EU institutions to borrow in international financial markets dilutes the distinction of the EU as an open or closed economy. While there could not be permanent current account imbalances between the EU and the rest of the world, the capacity to smooth the consequences of severe shocks would remain.

Contributions to and transfers from the European unemployment insurance fund vary significantly over time (Tables 3 and 4) and across member states (Tables 5 and 6) depending on the scenario and trigger mechanism but also on the national level of social security benefits and, particularly, on the labour market situation and economic developments. Average payouts are much higher in

[6] Although SURE regulation allows a country to request a larger amount, this condition ensures that the €60 billion limit of loans granted to the three Member States representing the largest share is met. Results for an alternative model with a limit based on GDP (2.5% of quarterly GDP) are shown in the Annex.

scenarios 1 and 2 as workers in STW are covered by the EUIS, while in scenario 3, only short-term unemployed are covered by the EUIS, resulting in lower average transfers from the EUIS. In particular, averaged over the whole period, the fund transfers an average pay-out of between 0.14% and 0.27% of GDP per quarter in scenarios 1 and 2, depending on the scenario and trigger, while payouts range between 0.03% and 0.09% in scenario 3. However, a more telling figure for a scheme based on an insurance logic is the non-zero average pay out since a simple average of the pay-outs includes all the cases where there is not pay-out at all. When it does activate, the fund provides on average a pay-out between 2% and 4.7% of GDP in scenarios 1 and 2 and between 0.8% and 1.3% in scenario 3.

Focusing on the distribution of payouts over time at the EA level, table 3 shows that there are clearly two peaks of support, in 2009 and mainly in 2020 in scenarios 1 and 2. In particular, the EUIS would have transferred payouts by as much as 0.62% and 3.84% of euro area GDP in 2009 and 2020 respectively. However, in scenario 3, the EUIS would have offered support mainly at the peak of the great financial crisis (ranging from 0.44% to 0.58% depending on the trigger) and somewhat less at the peak of the pandemic (from 0.11% to 0.29%), since workers in STW would not be covered. As a comparison figure, on average from 2000 to 2013, the euro area spent 1.3% of GDP in social public expenditure related to unemployment. Conversely, repayments of payouts (contributions) would have peaked in 2021 in scenarios 1 and 2 and in all scenarios the contributions would have been relatively high and constant from 2010 onwards (Table 4).

Table 3: Average payouts by year, EA (% GDP)

	Average Pay-out			Non-zero average Pay-out		
	Trigger 1	Trigger 2	Trigger 3	Trigger 1	Trigger 2	Trigger 3
2000	0.00	0.01	0.00	0.11	0.49	-
2001	0.06	0.01	0.01	0.59	0.37	0.33
2002	0.08	0.00	0.00	0.63	0.11	0.03
2003	0.12	0.03	0.02	0.74	1.14	1.58
2004	0.12	0.01	0.00	0.68	0.17	-
2005	0.03	0.00	0.00	0.44	-	-
2006	0.03	0.02	0.02	0.74	1.37	1.37
2007	0.01	0.00	0.00	0.33	0.02	-
2008	0.23	0.19	0.11	1.47	0.95	1.34
2009	0.53	0.62	0.47	1.15	1.69	1.97
2010	0.09	0.02	0.02	0.57	0.55	0.55
2011	0.15	0.06	0.06	0.75	0.78	0.91
2012	0.09	0.01	0.01	0.41	0.17	0.17
2013	0.12	0.03	0.03	0.72	0.95	0.95
2014	0.03	0.00	0.00	0.57	-	-
2015	0.04	0.03	0.00	0.60	1.24	-
2016	0.01	0.00	0.00	0.23	0.17	-
2017	0.00	0.00	0.00	-	0.01	-
2018	0.00	0.00	0.00	-	-	-
2019	0.00	0.00	0.00	-	-	-
2020	3.84	3.28	3.30	7.89	9.60	10.91
2021	0.46	0.03	0.03	2.50	2.51	2.51

Source: Author's own calculations based on Eurostat

Table 4: Average contributions by year, EA (% GDP)

	Average contribution			Non-zero average contribution		
	Trigger 1	Trigger 2	Trigger 3	Trigger 1	Trigger 2	Trigger 3
2000	0.00	0.00	0.00	0.00	0.01	0.00
2001	0.00	0.00	0.00	0.02	0.01	0.01
2002	0.00	0.00	0.00	0.02	0.01	0.01
2003	0.01	0.00	0.00	0.04	0.02	0.01
2004	0.01	0.00	0.00	0.04	0.02	0.01
2005	0.02	0.00	0.00	0.04	0.02	0.02
2006	0.02	0.00	0.00	0.04	0.02	0.03
2007	0.02	0.00	0.00	0.04	0.02	0.02
2008	0.01	0.00	0.00	0.04	0.03	0.03
2009	0.03	0.02	0.02	0.11	0.09	0.08
2010	0.07	0.05	0.04	0.11	0.08	0.09
2011	0.05	0.04	0.03	0.10	0.08	0.08
2012	0.05	0.04	0.03	0.11	0.09	0.09
2013	0.07	0.04	0.03	0.13	0.08	0.08
2014	0.07	0.04	0.03	0.13	0.08	0.07
2015	0.06	0.04	0.03	0.11	0.07	0.07
2016	0.06	0.03	0.02	0.10	0.06	0.06
2017	0.05	0.03	0.02	0.09	0.05	0.05
2018	0.04	0.03	0.02	0.08	0.05	0.05
2019	0.03	0.02	0.01	0.08	0.04	0.05
2020	0.14	0.12	0.11	0.42	0.35	0.34
2021	0.29	0.21	0.21	0.41	0.30	0.29

Source: Author's own calculations based on Eurostat

A comparison of average and non-zero average pay-outs can also be made at the country level. In scenarios 1 and 2, small countries with high unemployment rates and largely impacted by both the global financial crisis and the COVID-19 crisis like Portugal, Greece or Cyprus benefit considerably from high transfers as a percentage of their GDP (Table 5). Similarly, small countries with relatively high gross wages and large STW schemes like Austria also receive relatively large average transfers as a result of very high payouts at the peak of the COVID-19 crisis. On the other hand, large countries like France, Spain and Italy benefit less due to the 20 billion limit, despite the impact of both crises on their economies. Moreover, in the case of Italy, the number of short-term unemployed relative to overall unemployment is comparatively low, which results in lower average payouts despite the very high overall level of unemployment.

For example, in scenarios 1 and 2 the average pay-out that Portugal receives from 2000 to 2021 amounts up to 0.52% of its GDP per quarter, but taking only the quarters for which it did receive a payment, the average pay out is up to 8.9%. This again is due to the insurance principle: the fund does not activate often but when it does it can provide significant payments for some countries.

For Austria, the fund would have provided average and non-average pay-outs of up to 0.30% and 11% respectively due to very large payouts at the peak of the pandemic. On the contrary, Spain would have received support for smaller amounts, so that the average and non-average pay-outs are not that different (up to 0.15% and up to 3.68% respectively). Finally, in scenario 3, cross country differences are smaller. Using the unemployment rate as indicator variable, payouts range from 0.01% (0.4% non-zero average) of GDP in Germany to 0.13% in Estonia (1.4% non-zero average), while using the GDP as indicator variable transfers vary from 0.02% in Italy (0.62% non-zero average) to 0.12% in Spain (2.7% non-zero average). Finally, if the double trigger mechanism is used, the payouts would be even lower and the mechanism would be barely activated for many member states. However, the EUIS would provide significant payments for some countries. For example, Spain would have received non-zero average payouts of 3.3% of its GDP.

Table 5: Average payouts by country (% GDP)

	Average Pay-out			Non-zero average Pay-out		
	Trigger 1	Trigger 2	Trigger 3	Trigger 1	Trigger 2	Trigger 3
AT	0.30	0.26	0.26	1.99	5.62	11.00
BE	0.26	0.22	0.22	2.25	6.33	6.33
CY	0.62	0.43	0.42	3.64	9.56	12.28
DE	0.03	0.05	0.03	0.61	1.41	2.51
EE	0.32	0.28	0.24	2.79	3.05	4.31
ES	0.14	0.12	0.12	1.02	3.45	3.45
FI	0.27	0.17	0.15	2.40	3.85	6.53
FR	0.07	0.06	0.06	0.53	1.81	1.81
GR	0.30	0.22	0.21	1.85	1.38	1.67
IE	0.30	0.17	0.16	2.06	2.08	3.48
IT	0.09	0.07	0.07	0.71	2.15	3.03
LT	0.25	0.11	0.11	1.80	1.58	1.58
LU	0.41	0.19	0.15	3.04	2.84	4.40
LV	0.21	0.15	0.13	2.28	1.61	2.28
MT	0.47	0.46	0.43	4.63	4.04	9.53
NL	0.17	0.13	0.12	1.16	2.93	10.65
PT	0.52	0.32	0.30	2.27	7.00	8.90
SI	0.33	0.22	0.20	1.83	6.33	8.98
SK	0.17	0.14	0.14	2.16	3.14	4.17

Source: Author's own calculations based on Eurostat

Turning to the aggregate cumulative balance of the system and the flows of payouts and contributions generated by the scheme at the aggregate level, figure 6 shows that the total debt accumulated at the end of the period does not vary substantially regardless of the trigger in scenarios 1 and 2, largely due to the cap on country cumulative balances. However, the choice of the trigger mecha-

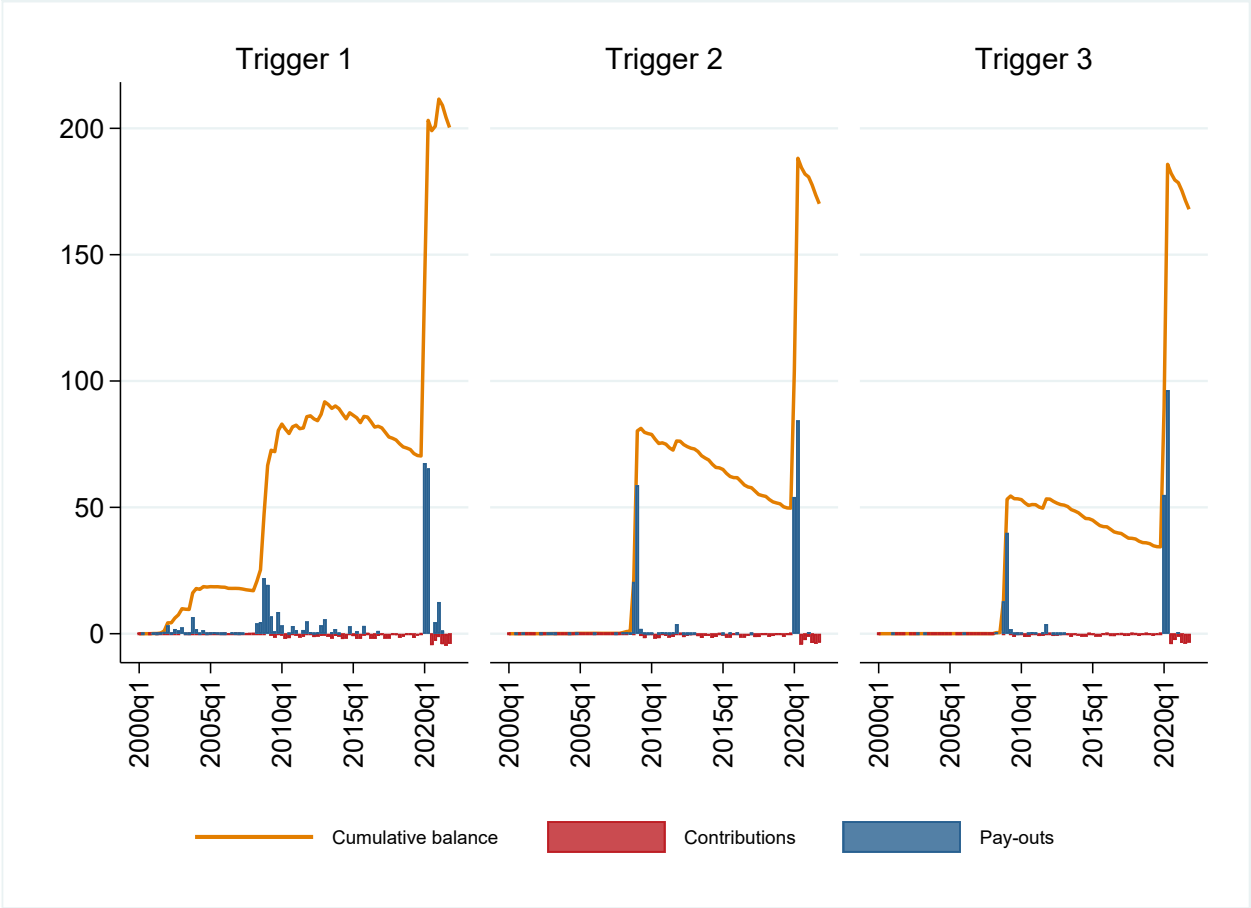
Table 6: Average contributions by country (% GDP)

	Average contribution			Non-zero average contribution		
	Trigger 1	Trigger 2	Trigger 3	Trigger 1	Trigger 2	Trigger 3
AT	0.05	0.03	0.03	0.13	0.11	0.48
BE	0.05	0.02	0.02	0.11	0.08	0.08
CY	0.08	0.04	0.03	0.21	0.14	0.15
DE	0.00	0.02	0.00	0.01	0.05	0.05
EE	0.05	0.05	0.04	0.17	0.18	0.14
ES	0.06	0.05	0.05	0.13	0.13	0.13
FI	0.05	0.03	0.02	0.19	0.14	0.10
FR	0.03	0.02	0.02	0.07	0.07	0.07
GR	0.07	0.06	0.05	0.17	0.15	0.17
IE	0.07	0.03	0.03	0.14	0.10	0.09
IT	0.03	0.02	0.02	0.11	0.07	0.06
LT	0.05	0.03	0.03	0.10	0.07	0.06
LU	0.06	0.03	0.02	0.15	0.07	0.04
LV	0.04	0.04	0.03	0.14	0.09	0.11
MT	0.06	0.06	0.05	0.14	0.14	0.12
NL	0.04	0.02	0.01	0.10	0.07	0.23
PT	0.08	0.04	0.04	0.20	0.13	0.13
SI	0.05	0.02	0.02	0.13	0.08	0.40
SK	0.02	0.01	0.01	0.04	0.04	0.27

Source: Author's own calculations based on Eurostat

nism has a significant impact on the flows that are generated and, therefore, on the system's ability to deal with truly large asymmetric shocks. A system based on the unemployment rate is not very selective since it does not provide much support at the peak of the financial crisis and it is activated for some countries between crisis, not allowing a quick repayment of the debt. On the other hand, if the GDP or the double trigger are used instead, the system is activated to provide support when it is really needed, allowing the amortization of the debt in periods of expansion, limiting the accumulated debt in the system and allowing a better support at the onset of the pandemic. Scenario 3 depicts a different picture in terms of the cumulative balance. When trigger 1 is used, the cumulative debt reaches over 90 billion at the peak of the global financial crisis, while it remains bellow 40 billion when the double trigger is used.

Figure 6: Pay-outs, contributions and cumulative balance by trigger, EA (Billions €)



Source: Author's own calculations based on Eurostat

4.5 Modelling: The NiGEM model

In order to assess the macroeconomic stabilisation provided by the EUI scheme, in this paper I follow a macro-econometric approach to simulate the adoption of such a scheme. In particular, I use the NiGEM macroeconometric model developed by the National Institute of Economic and Social Research (NIESR) to perform counterfactual simulations and measure the impact of a EUI on consumption, GDP and unemployment in eleven euro area Member States covering the period 2000Q1 to 2021Q4.[7] In a first step, payouts and contributions flows are genereated in Excel for each country. Second, these flows are feeded into NiGEM:

- Payouts are modelled as an (exogenous) shock to social transfers.
- An additional (exogenous) negative shock to government interests the size of payouts is introduced.
- Contributions are modelled as an (exogenous) shock to government interest payments.

[7]The sample represents 98% of euro area GDP: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain.

- In scenario 1, an additional (exogenous) negative shock to the number of employed persons is introduced.
- Monetary policy is kept endogenous so it can react. However, results with exogenous monetary policy are also provided.

Finally, to estimate the stabilising effects, the variance of (counterfactual) consumption and GDP, trend-adjusted using a Hodrick-Prescott filter, are computed.

NiGEM is a comprehensive simulation and forecasting model for the global economy incorporating typical New-Keynesian elements such as rational expectation formation by economic agents as well as price and wage rigidities. The model enables a broad but nonetheless detailed modeling of the global economy. NiGEM models all OECD countries as well as numerous emerging nations with up to 130 equations and the aim of simulating their reaction to exogenous developments; the simulations also factor in international feedback effects—through foreign trade, for example—as well as economic policy responses—such as monetary and fiscal policy—for economic developments.

The analysis uses counterfactual simulations. The model simulates an economic development in the past where the deviation from the actual historical course results from the development of exogenous or endogenous variables which diverge from reality. The simulations are created on the basis of quarterly data and simulate the introduction of a EUI scheme for the euro area.

NiGEM captures all social welfare benefits in a single variable called "transfers". Transfers consist primarily of pensions and to a lesser extent of other social benefits, including for unemployment. Higher transfers increase households' disposable income, which is used for saving and consumption purposes. Thus, an increase in transfers mainly affects the economy through higher consumption expenditures by private households. This raises aggregate demand and – if the economy has unused resources – raises output and employment.

The extent to which higher transfer benefits increases expenditure is determined by the marginal propensity to consume. One would usually assume that most of the additional unemployment benefits will be consumed by the unemployed, as these are in any case lower than the previous earned income. In contrast one might assume a lower share of additional pension benefits being consumed by pensioners (saving for bequest motives and/or because the pension is not offsetting a temporary decline in earned income). As NiGEM does not, however, distinguish between unemployment benefits and other types of benefits, all benefits are treated equally and the marginal propensity to consume in the model is the same for unemployment benefits as it is for pensions. In fact it is the average across all households for any given increase in disposable income. This should ceteris paribus leads to underestimate the additional household consumption expenditure forthcoming from an increase in unemployment benefits in NiGEM.

5 Modelling results

The analysis in this section is limited to the eleven EA member states included in the NiGEM model. Simulations conducted using the National Institute Global Economic Model (NiGEM) show that

had a common unemployment insurance scheme existed in the euro area since the creation of the Monetary Union in 1999, the cyclical fluctuations in some countries would have been considerably less pronounced. During periods of economic downturn, a European unemployment insurance would bolster disposable income and consequently stabilize consumption which, in turn, would have a stabilizing effect on production and employment in the countries affected. The loss of purchasing power in countries with strong economic growth would also have a stabilizing impact by cooling down the overheating economy. The impact would vary from country to country depending on the generosity of the insurance system; the trigger mechanism and the scenario.

5.1 Economic impact

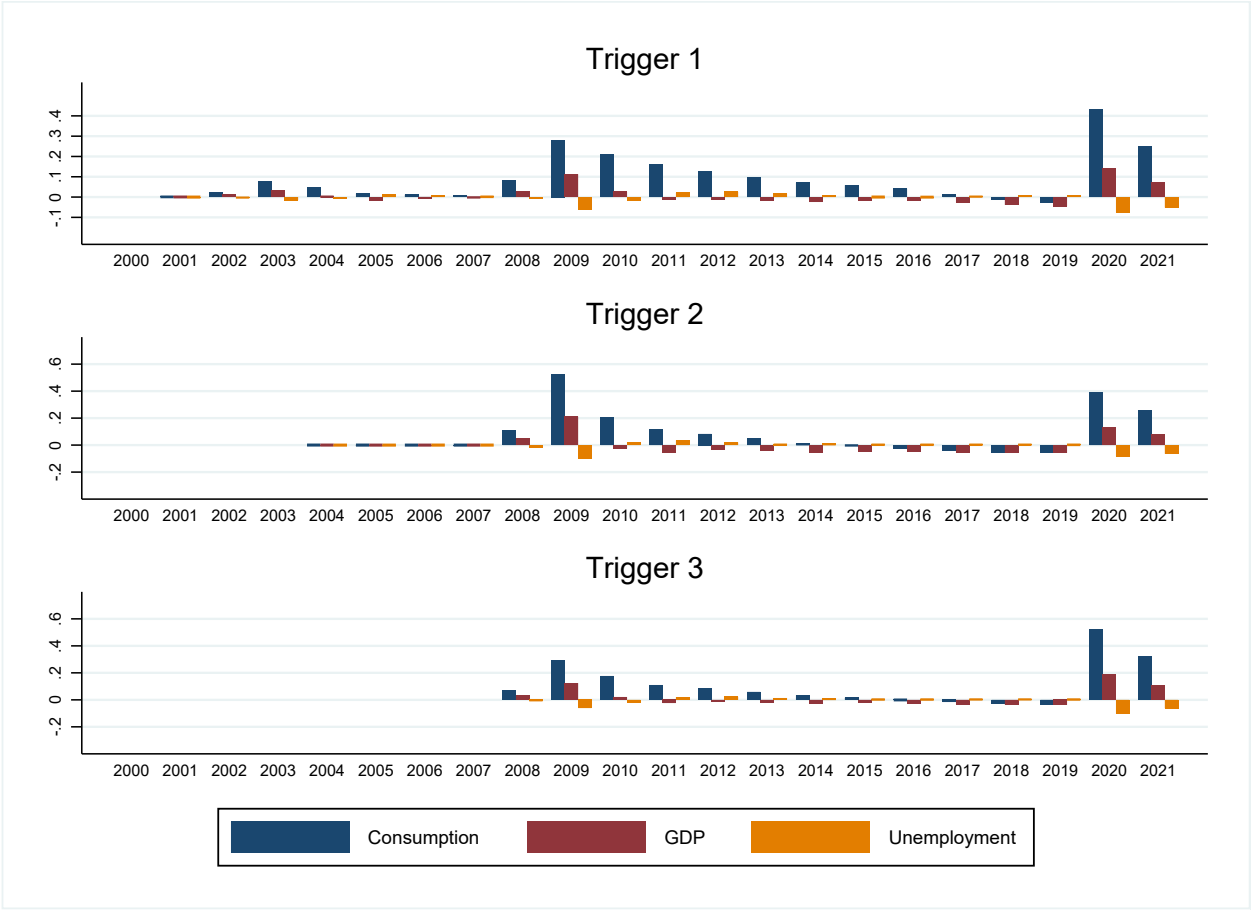
Looking at the entire euro area, a European unemployment insurance contribute to an increase in macroeconomic stability. In times of economic downturn, as in 2009 or 2020, a European unemployment insurance system would have raised households' disposable income, thus reducing consumption losses and ultimately mitigating the negative effects on growth. Moreover, income stabilisation in one country also benefits other countries via external demand. As shown in Figure 7, the introduction of a European unemployment insurance scheme would have significantly reduced GDP and consumption losses in the euro area in 2009 and in 2020. In particular, in 2009 the counterfactual gain in consumption in the eleven euro area countries studied stood at 0.29%, 0.5% and 0.3% with triggers 1, 2 and 3 respectively, compared with a situation without a European unemployment insurance. In 2020, the increase in consumption would be very similar with triggers 1 and 2, at 0.41% and 0.4% respectively, while with trigger 3 it would stood at 0.5% since it allows for a better replenishment of reserves.

In terms of GDP, there is a maximum stabilising effect of approximately 0.2% of the euro area's GDP in 2009 with trigger 2 and in 2020 with trigger 3 as the proximity of the two crises prevents the replenishment of reserves with triggers 1 and 2. Overall, in the run-up to the crisis (2005 to 2007) and also during the period of economic recovery (between 2011 and 2019), contractive effects on GDP are visible. This emphasizes the counter-cyclical nature of this European unemployment insurance model (Figure 7). However, the introduction of a European unemployment insurance would lead to a slight increase in euro area's GDP at the end of the period (2021), ranging from 0.07% with model 1 and trigger 1 to 0.29% with model 3 and trigger 3 (Table 7).

Regarding its impact on employment, a EUIS would have significantly lowered the increase in unemployment at the peak of both crises (2009-2010 and 2020-2021) and at the end of the period the counterfactual unemployment rate would be lower compared to the baseline scenario without EUIS (see Figure 7 and Table 7).

At the country level, increasing transfers from a European unemployment insurance would also result in counterfactual gains in consumption, GDP and employment, particularly for member states with weak economies, which could lead to significant deviations from the baseline, i.e., economic developments without a European unemployment insurance. As shown in Figure 8 and Table 7, the introduction of a European unemployment insurance scheme would have significantly increased average consumption and GDP in several member states. This is primarily due to a less severe slump

Figure 7: Counterfactual gain/losses in consumption, GDP and unemployment, EA11 (%)



Source: Author's own calculations based on NiGEM model

in disposable income which, in turn, moderates the downturn in consumer demand. In addition, as a result of the European unemployment insurance easing the burden on the national budget, there would be stronger growth in public spending which, in turn, would have a stabilising impact. For example, on average during the whole period, a EUIS would have increased consumption in approximately a 0.3% in Portugal and Greece in scenario 2 with trigger 1 (a slightly less average increase is obtained with triggers 2 and 3). In terms of GDP, the increase would have been more moderate, in both countries GDP would have expanded a 0.1% on average (Figure 8).

However, average results mask significant differences in the time profile of the effects of a EUIS by country. While during the COVID-19 crisis average increase in GDP and consumption would be higher in small countries like Belgium, Portugal and Greece, large countries like France, Italy and Spain would have benefited more during the global financial crisis (Figure 9). This is the result of the design of the mechanism. In model 1, the 20 billion limit of the system prevents large countries to receive more support during the pandemic, lowering the average increases in consumption and GDP and at the same time allows small countries to receive very large transfers at the peak of the COVID-19 crisis, which lead to large gains in both consumption and GDP in those countries. In model 2, which doubles the size and the limit, the counterfactual gains are larger for all countries but small countries still would have larger gains during the pandemic. However, when the system

Table 7: Counterfactual gain/losses in consumption, GDP and unemployment (%)

Trigger 1

	Model 1						Model 2						Model 3					
	2022			2039			2022			2039			2022			2039		
	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U
AT	-0.00	0.02	0.01	0.02	-0.01	0.00	-0.00	0.04	0.02	0.04	-0.01	0.00	0.02	0.10	0.05	0.04	-0.04	0.01
BE	1.10	0.19	-0.05	-0.46	-0.08	-0.00	2.48	0.47	-0.14	-0.90	-0.19	-0.00	0.58	0.08	0.02	-0.25	-0.03	0.01
DE	0.16	0.02	0.00	-0.00	0.01	-0.00	0.33	0.04	0.01	-0.01	0.03	-0.00	0.73	0.11	0.03	-0.06	0.06	-0.01
EA	0.15	0.02	-0.01	-0.05	0.01	-0.00	0.26	0.03	-0.01	-0.09	0.02	-0.01	0.28	0.02	0.02	-0.06	0.05	-0.01
ES	0.06	0.06	-0.04	-0.08	-0.00	0.00	0.13	0.08	-0.06	-0.15	-0.00	0.00	0.23	0.12	-0.06	-0.04	-0.00	0.01
FI	-0.07	-0.01	0.01	0.02	0.02	0.00	-0.11	-0.01	0.02	0.05	0.04	0.00	-0.12	-0.03	0.03	0.07	0.05	0.00
FR	-0.10	-0.08	0.02	-0.03	0.02	-0.01	-0.19	-0.16	0.04	-0.05	0.06	-0.03	-0.15	-0.20	0.08	-0.08	0.10	-0.04
GR	0.56	0.14	0.20	-0.29	-0.03	-0.01	0.54	0.14	0.21	-0.28	-0.02	-0.01	0.10	-0.02	0.09	-0.11	0.02	0.00
IE	-0.04	0.02	0.00	-0.02	0.01	-0.00	-0.06	0.04	0.00	-0.04	0.01	-0.00	-0.06	0.05	0.00	-0.04	0.02	-0.00
IT	0.10	0.01	-0.01	-0.04	0.01	-0.00	0.24	0.03	-0.01	-0.09	0.02	-0.00	0.31	0.07	-0.02	-0.07	0.05	-0.00
NL	-0.09	0.01	0.04	-0.00	0.01	0.00	-0.16	0.01	0.07	-0.00	0.02	0.00	-0.18	-0.03	0.12	0.01	0.02	0.01
PT	2.29	0.81	-0.55	-0.37	0.01	-0.02	2.27	0.79	-0.54	-0.35	0.02	-0.02	0.33	0.07	-0.09	-0.07	0.03	0.00

Trigger 2

	Model 1						Model 2						Model 3					
	2022			2039			2022			2039			2022			2039		
	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U
AT	-0.00	0.03	0.01	0.01	-0.00	0.00	-0.00	0.08	0.02	0.02	-0.00	0.00	0.01	0.13	0.04	0.04	-0.04	0.01
BE	1.25	0.25	-0.08	-0.44	-0.10	-0.00	2.59	0.54	-0.17	-0.88	-0.20	-0.00	0.71	0.16	0.00	-0.25	-0.03	0.01
DE	0.06	-0.03	0.01	-0.01	-0.02	0.00	0.21	0.01	0.01	-0.02	-0.02	-0.00	0.51	0.04	0.03	-0.06	0.06	-0.01
EA	0.17	0.03	-0.02	-0.07	-0.02	-0.00	0.48	0.14	-0.03	-0.13	-0.02	-0.01	0.48	0.13	-0.01	-0.06	0.05	-0.01
ES	0.23	0.10	-0.04	-0.11	-0.02	-0.00	1.08	0.41	-0.13	-0.26	-0.06	-0.01	0.64	0.27	-0.08	-0.04	-0.00	0.01
FI	-0.06	0.00	0.01	0.01	0.01	-0.00	-0.09	0.01	0.02	0.02	0.03	-0.00	-0.09	-0.01	0.03	0.07	0.05	0.00
FR	-0.01	-0.04	-0.00	-0.08	-0.02	-0.01	0.10	-0.01	-0.01	-0.16	-0.02	-0.02	0.33	0.04	-0.00	-0.08	0.10	-0.04
GR	0.36	0.08	0.12	-0.22	-0.07	-0.01	0.35	0.11	0.13	-0.21	-0.06	-0.01	0.10	0.02	0.08	-0.11	0.02	0.00
IE	-0.04	0.03	0.00	-0.02	0.01	-0.00	-0.05	0.07	-0.00	-0.03	0.01	-0.00	-0.06	0.07	0.00	-0.04	0.02	-0.00
IT	0.30	0.12	-0.02	-0.06	-0.01	-0.00	0.86	0.38	-0.06	-0.12	-0.01	-0.01	0.93	0.42	-0.07	-0.07	0.05	-0.00
NL	-0.08	0.03	0.03	-0.01	0.01	-0.00	-0.10	0.07	0.07	-0.00	0.02	-0.00	-0.12	0.02	0.13	0.01	0.02	0.01
PT	1.46	0.49	-0.32	-0.25	-0.01	-0.02	1.46	0.53	-0.34	-0.24	0.00	-0.02	0.48	0.17	-0.11	-0.07	0.03	0.00

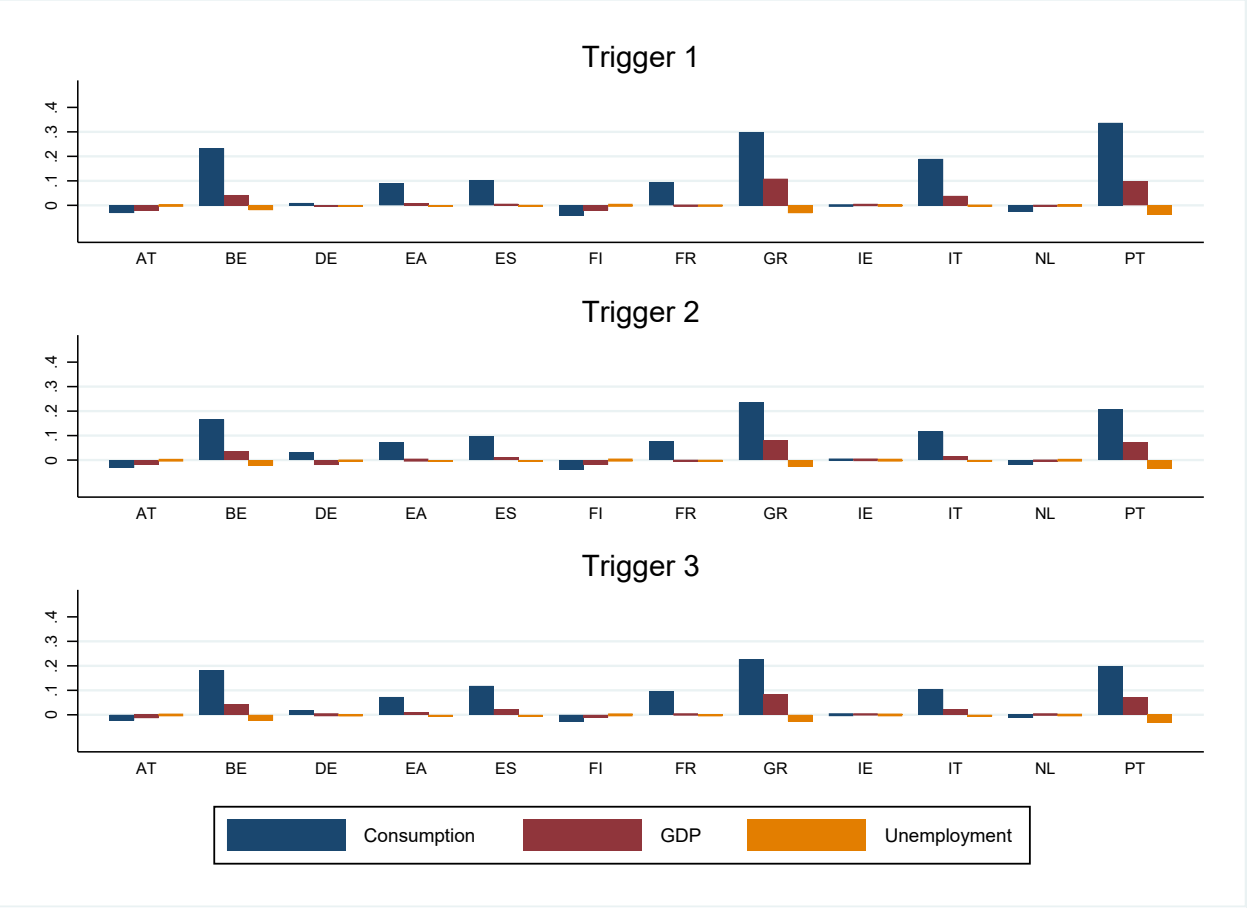
Trigger 3

	Model 1						Model 2						Model 3					
	2022			2039			2022			2039			2022			2039		
	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U
AT	-0.00	0.04	0.01	0.02	-0.01	0.00	-0.00	0.09	0.02	0.03	-0.01	0.00	0.01	0.14	0.05	0.04	-0.04	0.01
BE	1.26	0.24	-0.07	-0.44	-0.09	-0.00	2.59	0.53	-0.16	-0.88	-0.19	-0.00	0.72	0.15	0.01	-0.25	-0.03	0.01
DE	0.19	0.03	0.00	-0.01	-0.00	0.00	0.34	0.07	0.01	-0.02	0.00	-0.00	0.63	0.11	0.03	-0.06	0.06	-0.01
EA	0.22	0.06	-0.01	-0.06	-0.00	-0.00	0.53	0.16	-0.03	-0.13	-0.01	-0.01	0.53	0.15	-0.00	-0.06	0.05	-0.01
ES	0.24	0.11	-0.04	-0.10	-0.01	-0.00	1.09	0.42	-0.13	-0.25	-0.05	-0.01	0.65	0.28	-0.08	-0.04	-0.00	0.01
FI	-0.05	-0.00	0.01	0.01	0.01	-0.00	-0.09	0.00	0.02	0.02	0.03	-0.00	-0.09	-0.01	0.03	0.07	0.05	0.00
FR	-0.02	-0.05	0.01	-0.06	0.00	-0.01	0.10	-0.02	0.00	-0.14	-0.00	-0.02	0.33	0.03	0.00	-0.08	0.10	-0.04
GR	0.37	0.09	0.12	-0.21	-0.07	-0.00	0.37	0.11	0.14	-0.20	-0.07	-0.01	0.14	0.03	0.10	-0.11	0.02	0.00
IE	-0.03	0.03	-0.00	-0.02	0.00	-0.00	-0.04	0.07	-0.00	-0.02	0.01	-0.00	-0.05	0.07	0.00	-0.04	0.02	-0.00
IT	0.36	0.16	-0.03	-0.05	0.00	-0.00	0.92	0.42	-0.07	-0.12	0.00	-0.01	0.99	0.46	-0.07	-0.07	0.05	-0.00
NL	-0.06	0.02	0.04	-0.00	0.01	-0.00	-0.08	0.06	0.08	0.00	0.02	-0.00	-0.10	0.02	0.14	0.01	0.02	0.01
PT	1.38	0.47	-0.31	-0.24	-0.00	-0.02	1.38	0.51	-0.32	-0.23	0.01	-0.02	0.49	0.17	-0.11	-0.07	0.03	0.00

Source: Author's own calculations based on NiGEM model

sets a limit based on the size of the economy (as in model 3) the results differ considerably and large weak economies like France, Italy and Spain but also the euro area as a whole benefit more from the introduction of a EUIS.

Figure 8: Average counterfactual gain/losses in consumption, GDP and unemployment (%)



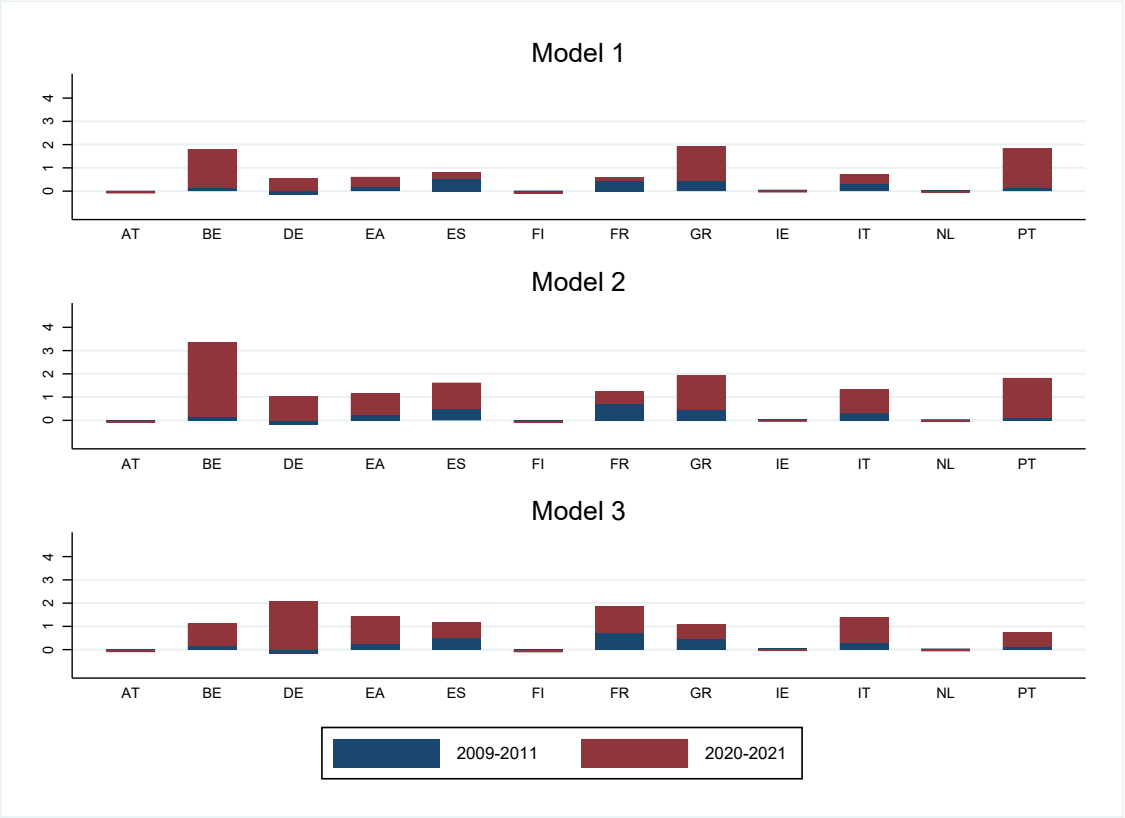
Source: Author's own calculations based on NiGEM model

On the other hand, the introduction of a European unemployment insurance would have had a primarily negative impact on growth in strong economies like Austria, Germany, Finland or the Netherlands for the period before the pandemic (Figure: 10 (panel a)) and particularly during the global financial crisis (Figure 9 (panel b)). The predominantly negative impact on the GDP of these countries is due to the low transfers they received from EUIS until the COVID-19 crisis as labour markets in these countries were hardly affected during the financial and subsequent debt crisis. Since other countries experienced significant increases in unemployment and received large sums of transfers from EUIS, lifting consumption and demand, monetary policy reacts raising interest rates, affecting aggregate demand and slowing down economic growth in all countries but affecting more negatively the aforementioned strong economies (Figure 10). However, during the COVID-19 crisis, all countries would have experienced stronger growth with a EUIS than without it (Figure 9 (panel b)), offsetting in most countries the negative impact prior to the pandemic (Figure 10 (panel b)).

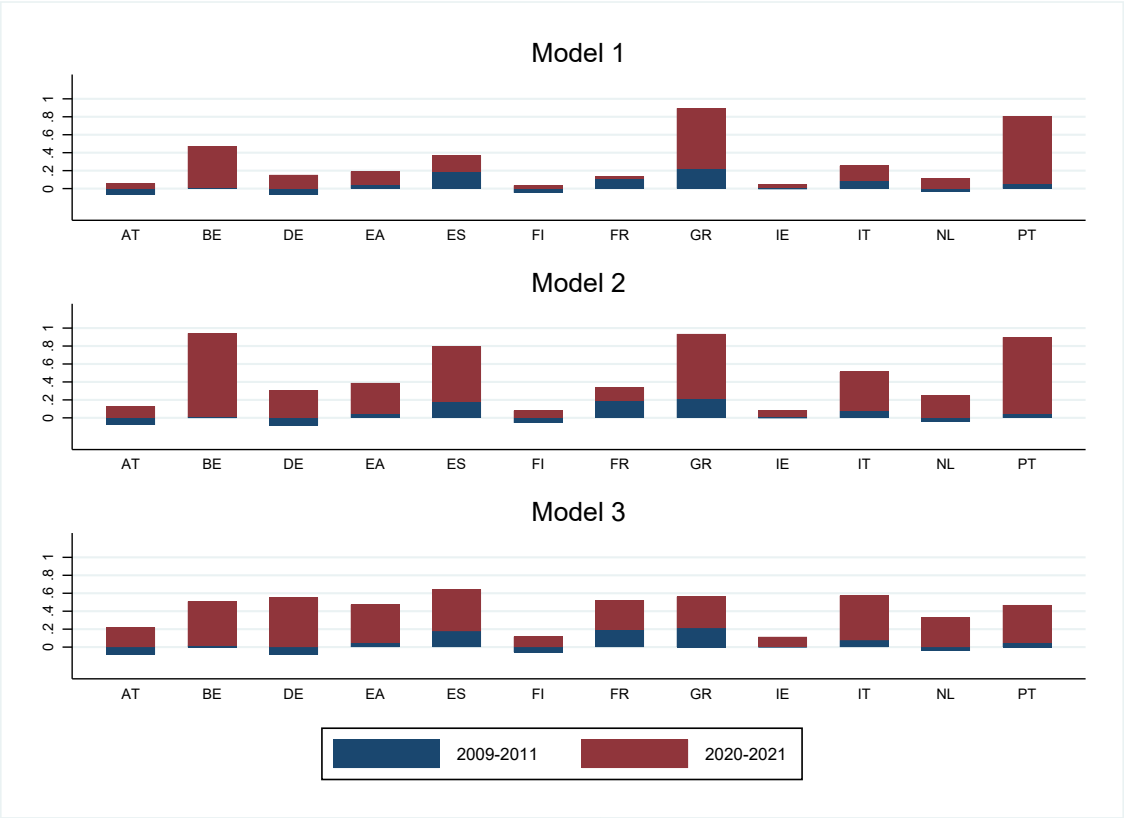
A EUIS, therefore, allows for income and consumption smoothing over time and implies a significant reduction in consumption, GDP and employment losses during a recession. At the same time, in the years immediately preceding the COVID-19 crisis, the growth in the GDP of several member states and of the euro area as a whole resulting from the European unemployment insurance would have been slightly more moderate. The transfers from the European unemployment insurance

Figure 9: Average counterfactual gain/losses by period (%)

(a) Consumption



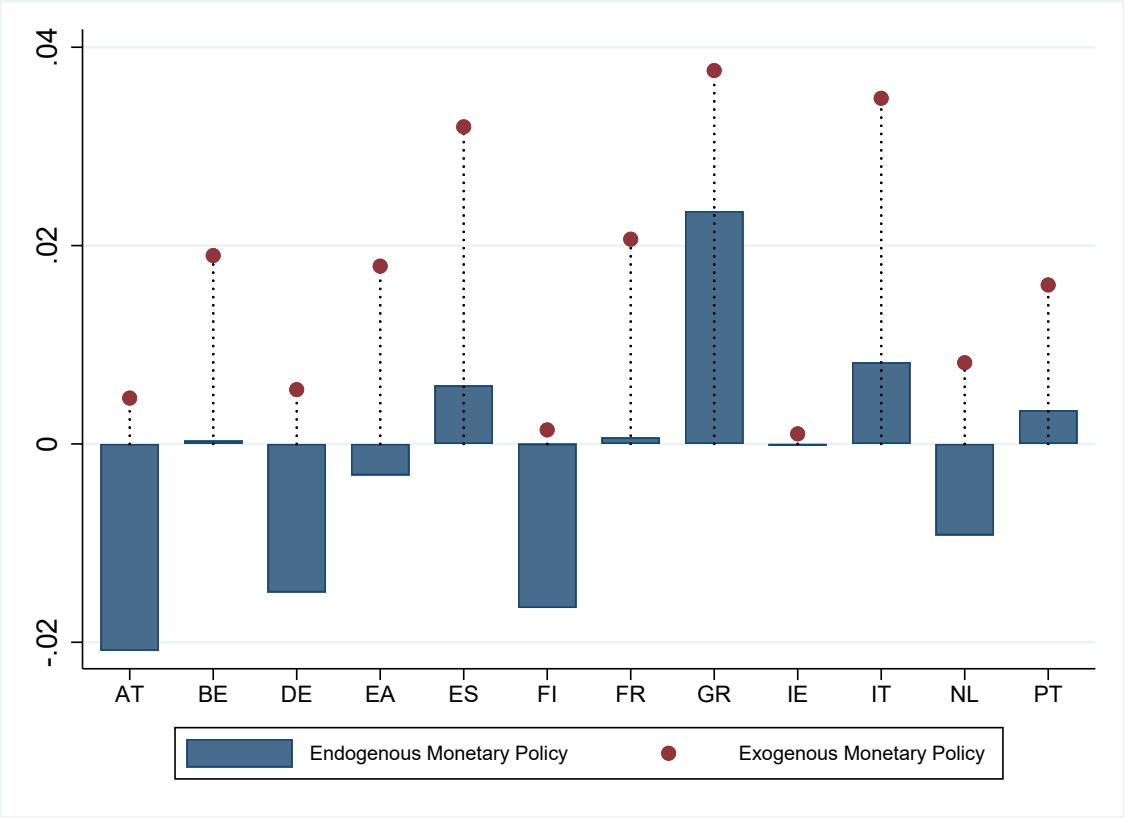
(b) GDP



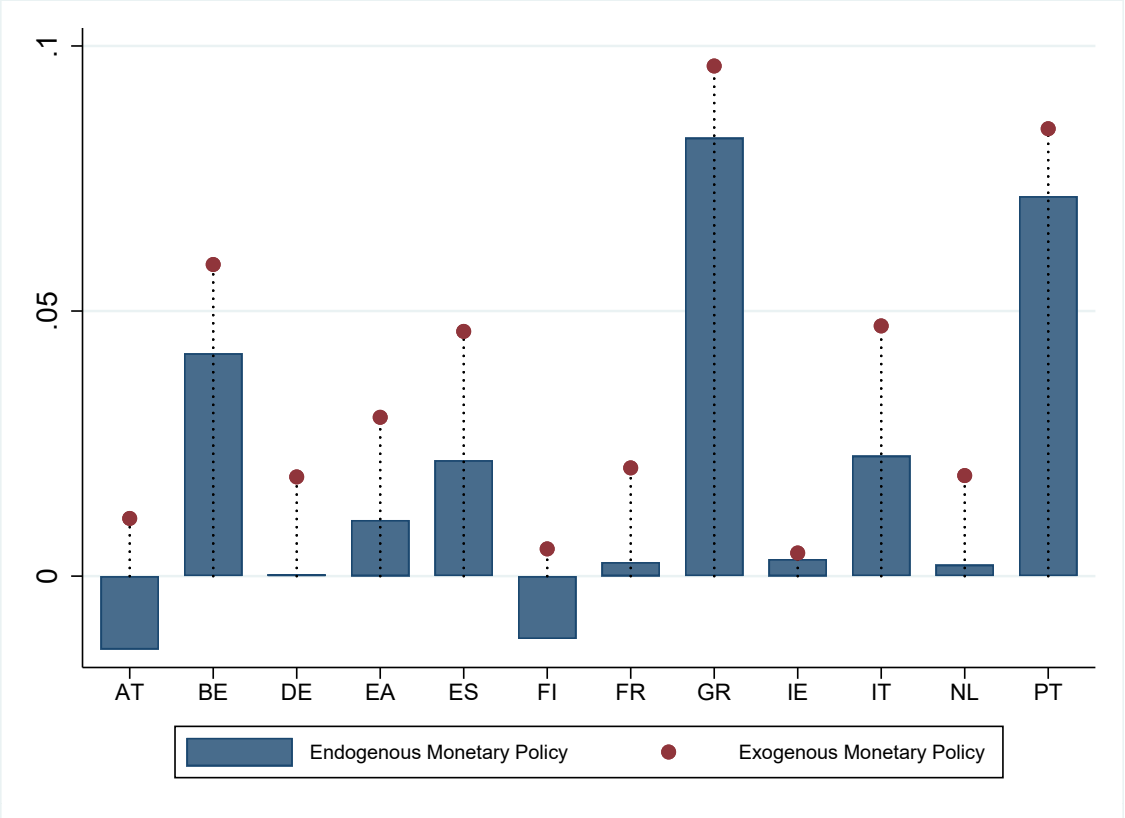
Source: Author's own calculations based on NiGEM model

Figure 10: Average counterfactual gain/losses in GDP, active vs. non-active Monetary Policy (%)

(a) 2000-2019



(b) 2000-2021



Source: Author's own calculations based on NiGEM model

scheme would have decreased in the pre-crisis period because unemployment was also declining. This would have subdued the expansion of private consumer demand and thus also mitigated the overheating of the economy somewhat. However, during periods of high growth—or periods of low unemployment—a European unemployment insurance would have resulted in dampening effects on the economies of the member states. Due to the growth in employment during economic upswings, contributions also increase, leading to an outflow of cash which, in turn, slows overall economic growth. Nonetheless, while a EUIS carries a cost in terms of GDP in expansionary periods, this tends to fade away and even carries counterfactual output gains, albeit minimal, in the long run (Table 7).

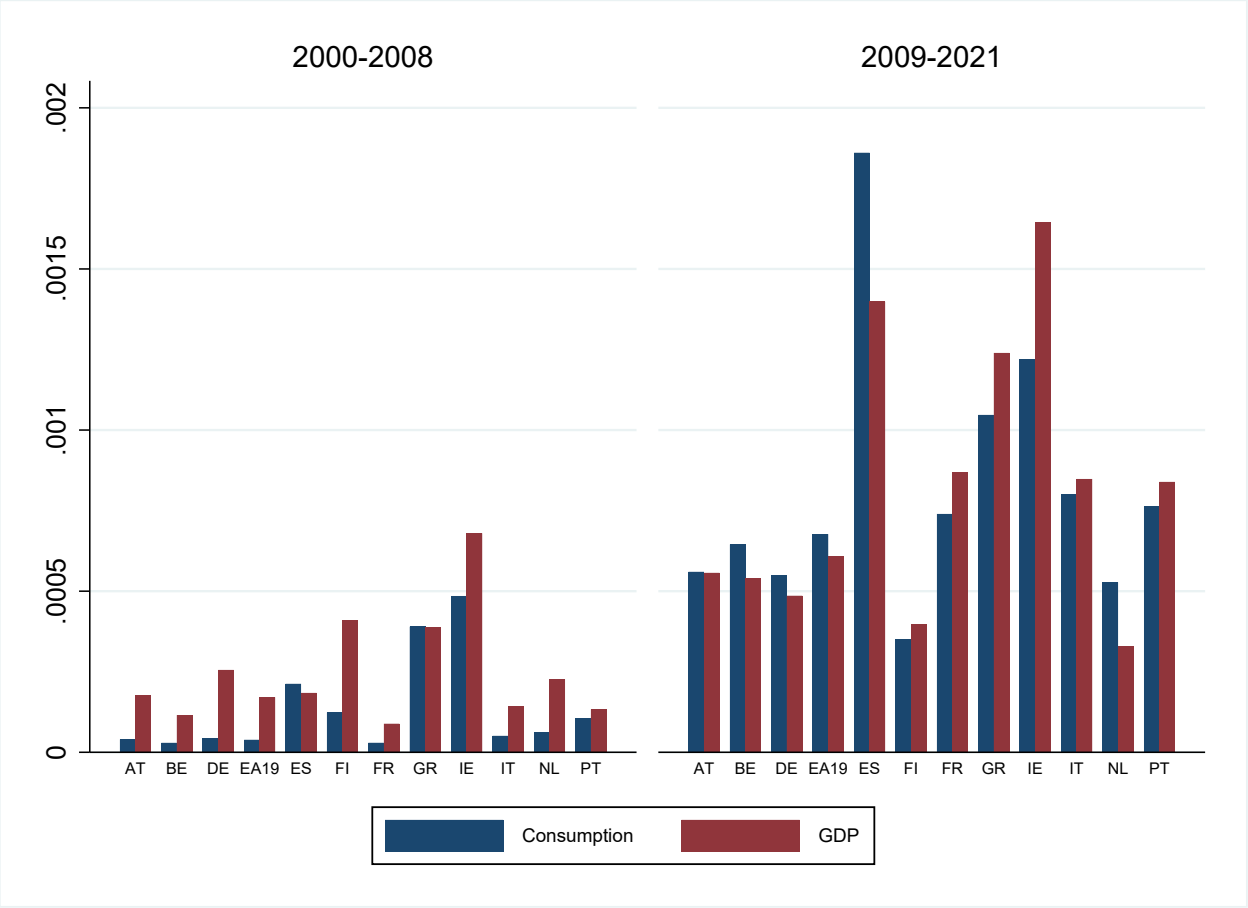
5.2 Stabilisation

The smoothing out of consumption, GDP and unemployment can be measured by the decline in their variance. In this section, I compare the variance of consumption, GDP and unemployment trend-adjusted using a Hodrick-Prescott (HP) filter, with and without EUIS, first within countries and then across countries.

5.2.1 Within countries

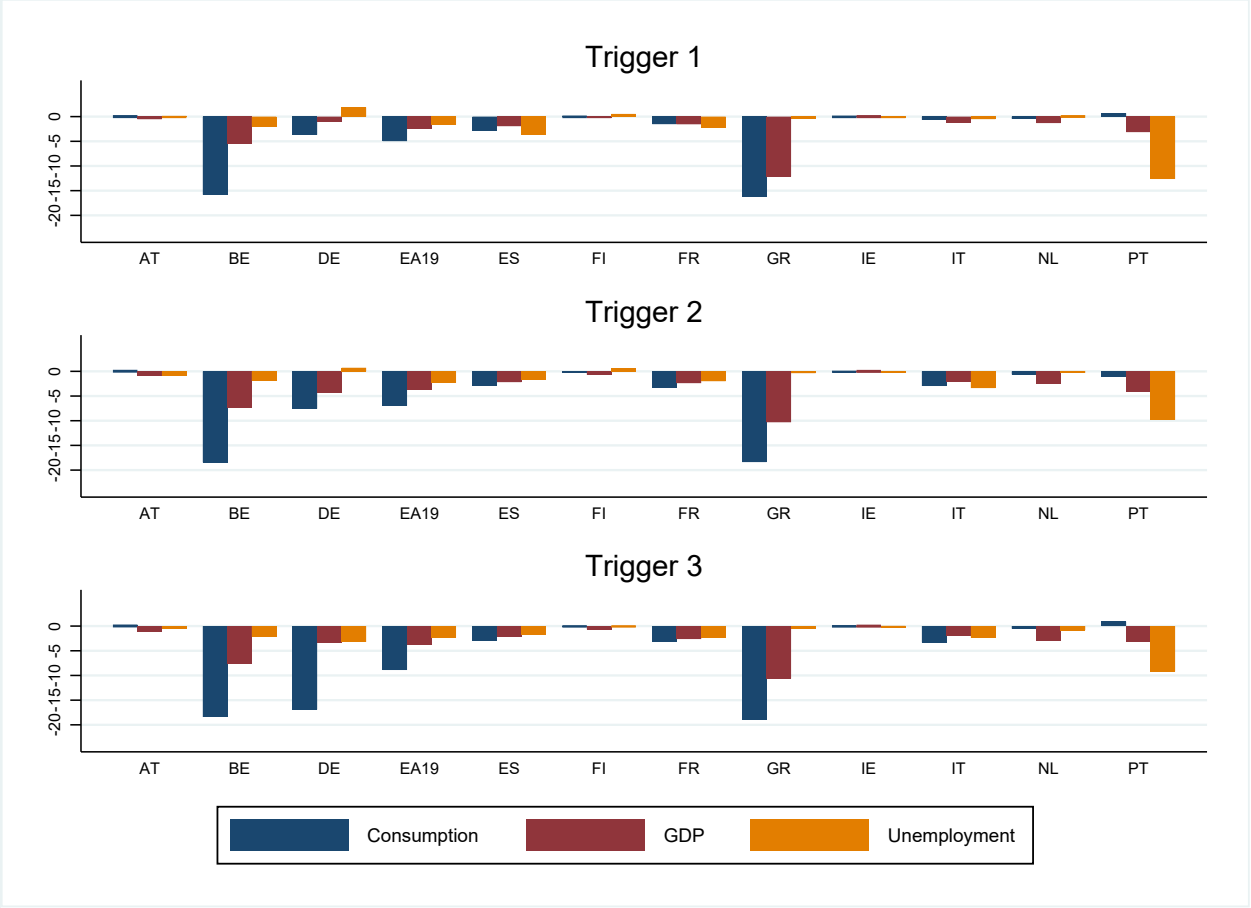
Most countries have experienced a significant increase in the volatility of their business cycles, particularly since the onset of the global financial crisis (Figure 11). Introducing a EUIS would have led to a decline in consumption, GDP and unemployment volatility for almost all countries. At the aggregate level, the variance of consumption in the euro area decreases between 5% and 9% depending on the trigger. In general, all countries to some extend benefit from introducing a EUIS, with some countries like Belgium and Greece benefiting from a decline in the variance of consumption and GDP by more than 15% and 5% respectively (Figure 12) with triggers 2 and 3 providing slightly more stabilisation overall.

Figure 11: Dispersion across time (2000-2021)



Source: Author's own calculations based on Eurostat

Figure 12: Counterfactual gain/losses in dispersion across time (%)



Source: Author's own calculations based on NiGEM model

Table 8: Counterfactual gain/losses in dispersion across time (%)

Trigger 1

	Model 1						Model 2						Model 3					
	2000-2021			2000-2039			2000-2021			2000-2039			2000-2021			2000-2039		
	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U
AT	0.03	-0.61	-0.27	0.03	-0.63	0.06	0.04	-1.31	-1.15	0.04	-1.35	-0.46	0.09	-2.69	-1.74	0.09	-2.78	-0.41
BE	-17.53	-6.12	-4.50	-17.60	-6.14	-5.15	-40.04	-14.60	-9.47	-40.02	-14.59	-10.74	-8.60	-7.83	-4.54	-8.64	-7.87	-5.19
DE	-4.61	-1.17	1.64	-4.83	-1.19	1.56	-11.67	-3.17	3.11	-11.90	-3.21	2.97	-40.84	-8.87	-0.61	-40.01	-8.95	-0.22
EA	-5.46	-2.65	-2.43	-5.50	-2.68	-2.65	-10.39	-5.03	-4.05	-10.43	-5.08	-4.32	-17.56	-7.09	-2.82	-17.63	-7.16	-2.86
ES	-3.24	-2.38	-3.95	-3.22	-2.48	-3.86	-6.11	-4.52	-5.61	-6.07	-4.69	-5.44	-4.85	-3.96	-4.97	-4.82	-4.15	-4.82
FI	-0.07	-0.29	0.56	-0.07	-0.29	0.58	-0.12	-0.79	0.42	-0.13	-0.79	0.45	-0.06	-1.38	-0.31	-0.07	-1.38	-0.29
FR	-1.59	-1.54	-2.40	-1.61	-1.54	-2.43	-2.27	-3.39	-6.07	-2.32	-3.39	-6.10	-4.49	-4.66	-6.87	-4.58	-4.69	-7.00
GR	-16.39	-13.06	-0.29	-16.08	-13.08	-0.76	-16.34	-13.14	-0.31	-16.03	-13.17	-0.76	-8.32	-5.55	0.54	-8.24	-5.56	0.25
IE	-0.10	-0.02	-0.30	-0.10	-0.02	-0.23	-0.18	-0.06	-0.55	-0.18	-0.07	-0.41	-0.17	-0.13	-0.82	-0.17	-0.14	-0.56
IT	-0.86	-1.30	-0.54	-0.90	-1.32	-0.62	-3.61	-2.47	-3.09	-3.67	-2.50	-3.16	-3.84	-2.87	-2.90	-3.91	-2.92	-2.99
NL	-0.50	-1.49	-0.30	-0.46	-1.53	-0.31	-0.91	-3.38	-1.28	-0.84	-3.43	-1.25	-1.11	-5.87	-2.01	-0.99	-5.96	-1.53
PT	-0.24	-5.88	-16.27	0.08	-6.13	-17.58	-0.29	-6.74	-16.76	0.03	-7.00	-18.01	-3.42	-4.95	-6.90	-3.45	-5.04	-7.20

Trigger 2

	Model 1						Model 2						Model 3					
	2000-2021			2000-2039			2000-2021			2000-2039			2000-2021			2000-2039		
	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U
AT	0.08	-0.89	-0.91	0.08	-0.90	-0.62	0.16	-1.93	-1.30	0.17	-1.96	-0.66	0.20	-3.39	-1.56	0.09	-2.78	-0.41
BE	-20.18	-7.80	-4.69	-20.24	-7.80	-5.40	-41.65	-16.86	-8.71	-41.62	-16.83	-10.15	-10.11	-10.07	-2.69	-8.64	-7.87	-5.19
DE	-7.07	-4.25	0.53	-6.82	-4.25	0.50	-21.29	-7.50	-1.20	-20.45	-7.52	-1.03	-44.16	-12.76	1.79	-40.01	-8.95	-0.22
EA	-7.27	-3.80	-3.20	-7.26	-3.82	-3.41	-15.57	-7.05	-5.26	-15.54	-7.12	-5.64	-22.83	-9.32	-3.36	-17.63	-7.16	-2.86
ES	-3.44	-2.76	-2.01	-3.42	-2.88	-1.96	-7.53	-6.43	-3.54	-7.50	-6.74	-3.42	-5.69	-5.37	-3.00	-4.82	-4.15	-4.82
FI	-0.25	-0.69	0.61	-0.26	-0.69	0.61	-0.19	-1.28	0.29	-0.20	-1.28	0.29	-0.19	-1.82	-0.19	-0.07	-1.38	-0.29
FR	-3.54	-2.41	-2.42	-3.58	-2.42	-2.52	-7.88	-5.07	-2.71	-7.99	-5.09	-3.00	-12.94	-7.52	0.20	-4.58	-4.69	-7.00
GR	-18.55	-10.65	-0.32	-18.32	-10.65	-0.79	-18.53	-10.94	-0.33	-18.30	-10.93	-0.81	-9.26	-5.81	0.34	-8.24	-5.56	0.25
IE	-0.16	-0.03	-0.31	-0.16	-0.04	-0.25	-0.18	-0.12	-0.65	-0.18	-0.13	-0.50	-0.18	-0.18	-0.90	-0.17	-0.14	-0.56
IT	-3.47	-2.34	-3.44	-3.53	-2.37	-3.55	-8.51	-4.41	-4.22	-8.63	-4.48	-4.39	-9.04	-5.07	-4.28	-3.91	-2.92	-2.99
NL	-0.64	-2.61	-0.61	-0.61	-2.62	-0.70	-1.06	-5.40	-1.72	-1.01	-5.45	-1.81	-1.33	-7.78	-1.84	-0.99	-5.96	-1.53
PT	-2.09	-6.25	-12.99	-1.99	-6.49	-13.68	-2.13	-7.67	-13.84	-2.03	-7.91	-14.40	-3.50	-6.55	-7.22	-3.45	-5.04	-7.20

Trigger 3

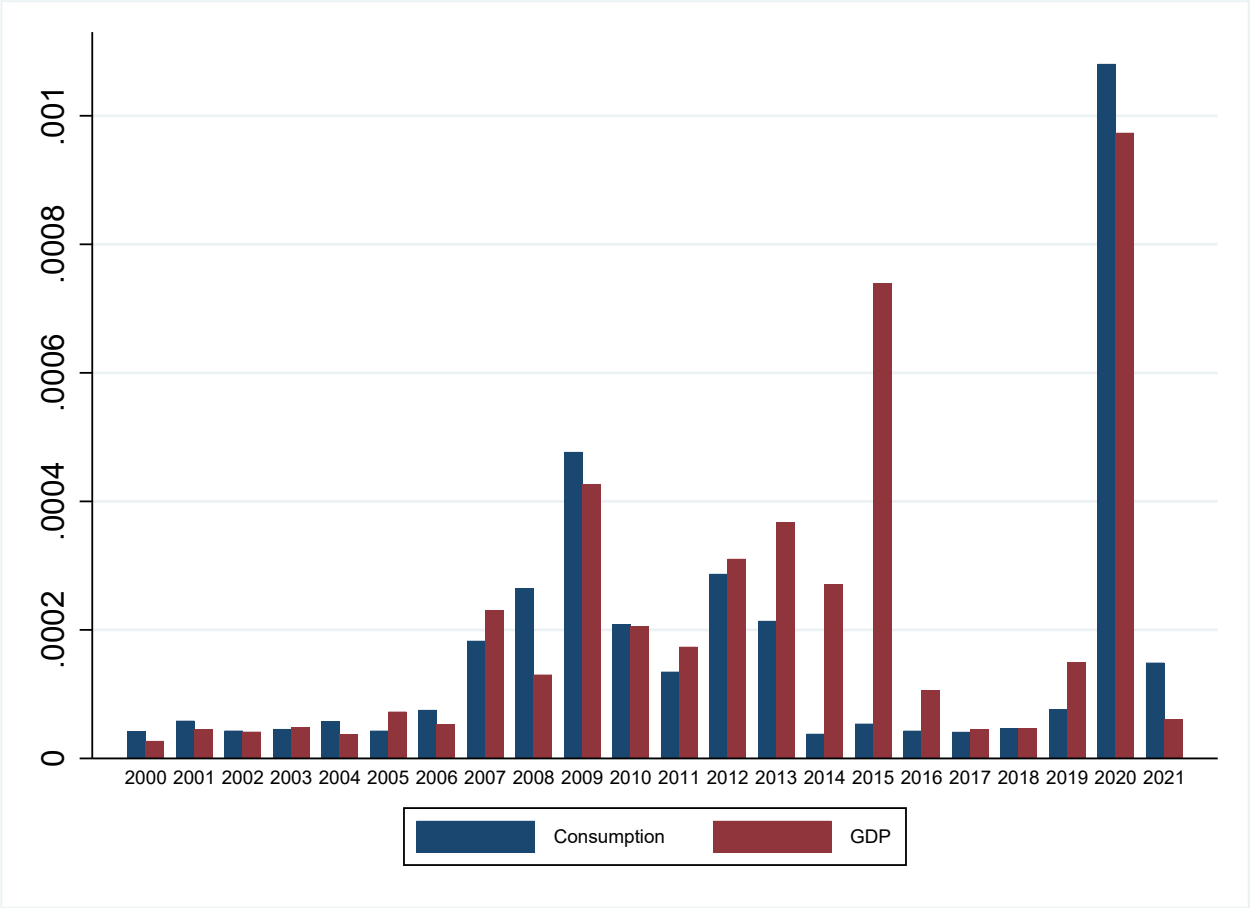
	Model 1						Model 2						Model 3					
	2000-2021			2000-2039			2000-2021			2000-2039			2000-2021			2000-2039		
	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U	C	GDP	U
AT	0.07	-1.11	-0.71	0.08	-1.13	-0.31	0.16	-2.14	-1.12	0.17	-2.18	-0.35	0.20	-3.59	-1.36	0.09	-2.78	-0.41
BE	-20.15	-8.10	-5.03	-20.21	-8.10	-5.76	-41.62	-17.11	-8.86	-41.58	-17.08	-10.30	-10.08	-10.36	-2.98	-8.64	-7.87	-5.19
DE	-15.37	-3.44	-2.55	-14.70	-3.46	-2.34	-28.52	-6.61	-3.37	-27.34	-6.64	-3.02	-49.46	-11.70	1.83	-40.01	-8.95	-0.22
EA	-9.18	-3.96	-3.25	-9.16	-3.99	-3.43	-17.38	-7.19	-5.27	-17.35	-7.27	-5.62	-24.54	-9.45	-3.33	-17.63	-7.16	-2.86
ES	-3.43	-2.79	-1.98	-3.41	-2.91	-1.93	-7.52	-6.45	-3.51	-7.49	-6.77	-3.39	-5.68	-5.39	-2.97	-4.82	-4.15	-4.82
FI	-0.08	-0.68	-0.18	-0.09	-0.68	-0.18	-0.02	-1.27	-0.51	-0.03	-1.27	-0.51	-0.03	-1.80	-0.99	-0.07	-1.38	-0.29
FR	-3.47	-2.64	-2.77	-3.52	-2.65	-2.86	-7.81	-5.31	-3.09	-7.93	-5.33	-3.36	-12.87	-7.75	-0.14	-4.58	-4.69	-7.00
GR	-19.06	-10.92	-0.53	-18.83	-10.91	-0.99	-19.04	-11.20	-0.54	-18.81	-11.19	-1.01	-10.83	-6.63	0.05	-8.24	-5.56	0.25
IE	-0.10	-0.04	-0.37	-0.10	-0.05	-0.27	-0.12	-0.12	-0.71	-0.12	-0.14	-0.53	-0.12	-0.19	-0.96	-0.17	-0.14	-0.56
IT	-3.88	-2.30	-2.36	-3.94	-2.34	-2.52	-8.87	-4.35	-3.11	-9.00	-4.44	-3.30	-9.40	-5.02	-3.16	-3.91	-2.92	-2.99
NL	-0.60	-3.01	-1.25	-0.57	-3.04	-1.28	-1.02	-5.77	-2.35	-0.97	-5.83	-2.34	-1.29	-8.12	-2.45	-0.99	-5.96	-1.53
PT	-0.15	-5.24	-12.23	-0.08	-5.47	-12.96	-0.20	-6.67	-13.10	-0.12	-6.90	-13.71	-1.47	-5.77	-7.10	-3.45	-5.04	-7.20

Source: Author's own calculations based on NiGEM model

5.2.2 Across countries

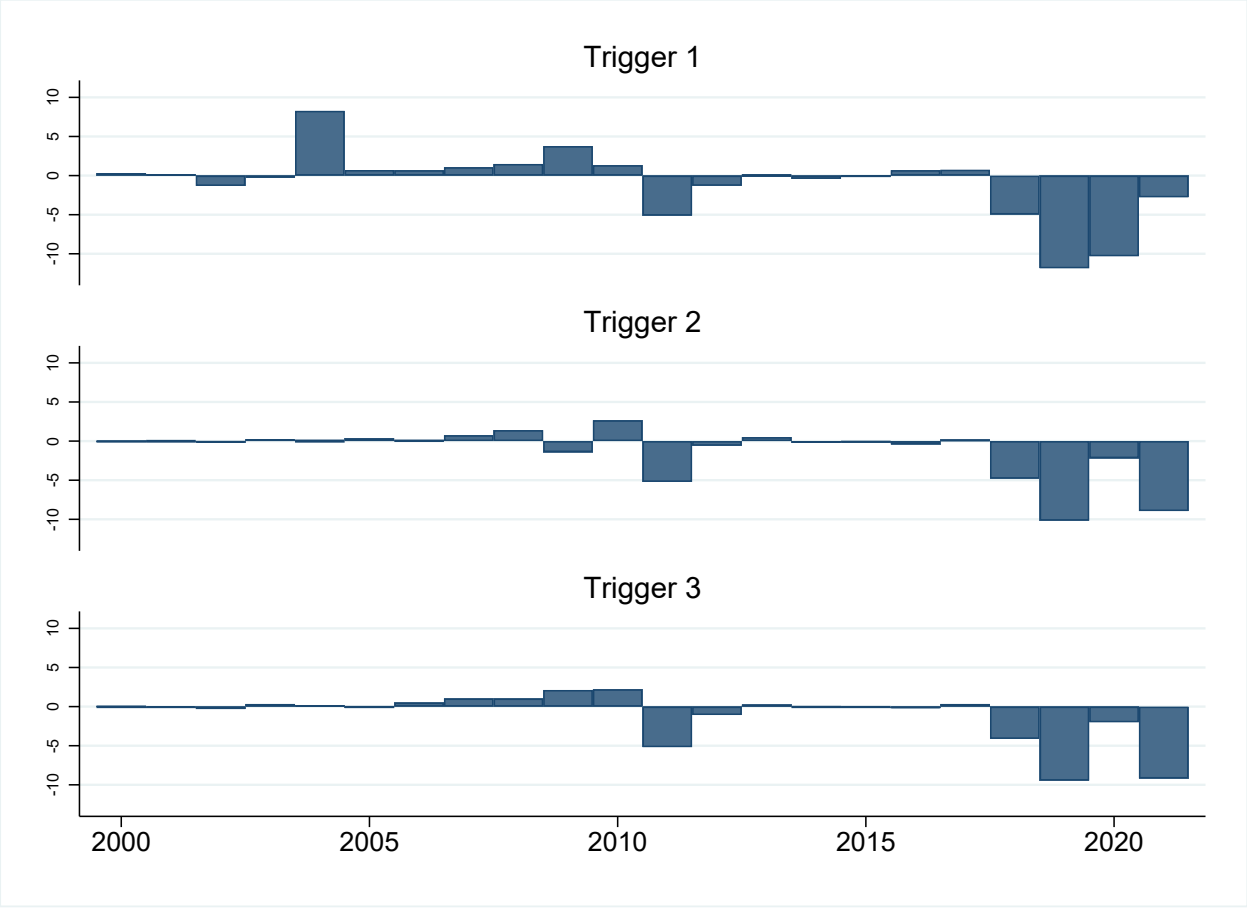
The dispersion between business cycles among euro area countries have also experienced a significant increase during downturns (Figure 13). The introduction of a EUIS would have also lowered the dispersion of real cycles in euro area countries, particularly around the COVID-19 crisis but also at the onset of the Global Financial Crisis (Figure: 14), implying that business cycles are better synchronized, even in the long term when the limit of loans is based on GDP (Model 3) instead of based on a fixed amount (Models 1 and 2) (Table 9).

Figure 13: Dispersion across countries (2000-2021)



Source: Author's own calculations based on Eurostat

Figure 14: Average counterfactual gain/losses in GDP dispersion across countries, EA11 (%)



Source: Author's own calculations based on NiGEM model

Table 9: Counterfactual gain/losses in dispersion across countries, EA11 (%)

	2009			2020			2039		
	C	GDP	U	C	GDP	U	C	GDP	U
Model 1, trigger 1	-3.59	3.77	7.97	22.12	-10.32	-16.51	0.33	7.54	15.73
Model 1, trigger 2	23.85	-1.41	-2.77	6.31	-2.18	-3.89	-0.12	4.82	9.91
Model 1, trigger 3	-1.97	2.13	4.46	5.82	-2.01	-3.51	0.30	4.34	8.91
Model 2, trigger 1	5.59	4.17	8.73	26.34	-11.41	-17.98	1.08	6.81	14.20
Model 2, trigger 2	31.27	-1.15	-2.26	5.18	-4.70	-8.51	0.17	4.26	8.79
Model 2, trigger 3	6.20	2.39	5.04	4.96	-4.50	-8.08	0.58	3.76	7.74
Model 3, trigger 1	4.51	3.97	8.37	2.36	-3.35	-6.25	1.96	-1.60	-3.15
Model 3, trigger 2	31.25	-1.18	-2.32	-3.89	-3.46	-6.52	1.07	-0.86	-1.68
Model 3, trigger 3	6.18	2.36	4.98	-2.83	-3.24	-6.03	1.48	-1.03	-2.03

Source: Author's own calculations based on NiGEM

6 Conclusions

This paper evaluates an inter-temporal reinsurance mechanism that closely resembles the Temporary Support to Mitigate Unemployment Risks is an Emergency (SURE), which the European Commission introduced in 2020 in response to the coronavirus outbreak, as a tool to alleviate budgetary pressure through the recessionary increase in unemployment expenditures. In particular, it analyses the counterfactual welfare gains and macroeconomic stabilisation effects of introducing such a mechanism. The analysis finds significant benefits from such an instrument, contrary to the conventional classical view, which suggests that such automatic stabilisers should have little impact on welfare due to the low costs of business cycles (*Lucas Jr*, 2003). The analysis provides support for this European policy, which can make a significant contribution to stabilising economic developments, cushioning part of the disturbances in times of crisis. It could both lower the amplitude of national cycles and increase the synchronisation of cycles across member countries. The increased stabilisation of the cycles within the euro area comes at the cost of a very slight slowdown in countries' growth trajectory at the peak of the cycle, arising from the contributions collected during higher growth periods and for strong economies also during downturns due to monetary policy action.

Finally, it should be noted that the results presented are somewhat conservative as NiGEM assumes that the unemployed have the same propensity to consume as other households. Therefore, the welfare gains presented in this paper can be seen as a lower-bound, but not out of sync with the gains that most euro area countries can achieve with a risk-sharing EUIS. On the other hand, the mechanism proposed is based on intergovernmental loans. Thus, governments might not directly transfer these funds to households (as this paper assumes) and as a result the scheme could have less impact (*Burriel et al.*, 2020). In this sense, a genuine fiscal risk-sharing mechanism at the European level, of sufficient size, would have a much greater capacity to achieve the optimal aggregate tone of fiscal policy, thus complementing the work of monetary policy. Along with these considerations, the introduction of a fiscal mechanism at the supranational level could change the incentives of national governments, so it should be integrated into a deeper fiscal union, which mitigates moral hazard among its participants.

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A Designing and modelling a EUIS

This section illustrates the main challenges related to the implementation of an EUBS, together with some solutions proposed in the literature. I have focused on studies that simulated the effect of potential EUBS because these studies had to make choices regarding their operational definitions and how some commonly encountered problems were dealt with. Examples of such studies include *Dullien* (2013, 2014), *Italianer and Vanheukelen* (1993), *Beblavý and Maselli* (2014), *Beblavý et al.* (2015), *Jara and Sutherland* (2014) and *Dolls et al.* (2014).

A.1 Designing options

According to the terminology of *Beblavỳ et al.* (2017), a EUI system for the euro area could be designed in two ways: a so-called "genuine" insurance system, or an "equivalent" system.

- In a "genuine" eurozone unemployment insurance scheme, the insurance is provided directly to individuals in the event of unemployment, temporary transfers made directly by the central authority and there is no national government intervention *Thirion* (2017). The main objective of this scheme is to stabilize household income in the event of a negative shock and it is permanently active (*Beblavỳ et al.*, 2017). Examples of these proposals are *Dullien* (2013) and *Dolls et al.* (2018).
- An "equivalent scheme" is a reinsurance mechanism for existing national unemployment schemes, in which transfers inter-government are directly related to the unemployment rate but not to output gaps (in contrast with the rainy-day funds, that are linked to output gaps). Using the unemployment rate has several advantages over using the output gap, such as the fact that it is directly observable, more accurate in forecasting, and less subject to adjustment. This mechanism allows transfers between countries unaffected by asymmetric shocks and countries primarily affected by the shock, ensuring risk sharing and enabling stability in the euro area. Transfers are made directly to the government experiencing the negative shock, but not to individuals (*Dolls et al.*, 2018; *Thirion*, 2017). Typically, this mechanism incorporates a trigger, meaning that a country will receive payment only when the threshold is reached and the mechanism is activated (*Beblavỳ et al.*, 2017). A low threshold implies that the insurance scheme is triggered frequently and vice versa. Also in this system, the conditions that determine the pay-in and pay-out are similar across the countries. One crucial caveat is how the funds received are used by the government: are these funds earmarked to unemployment benefits or can governments choose how these funds are spent? The stabilisation capacity of the reinsurance scheme depends on this.

Within the set of genuine EUIS, there is a distinction between "basic" and "top-up" schemes. Basic schemes are widely supported, while few studies view top-up schemes as viable (*Delpla*, 2012). The idea behind a basic genuine European unemployment insurance system is to create a scheme that (at least) partly replaces existing national schemes. Benefits are paid out directly to the unemployed, and the same conditions apply to all workers in Europe. National governments can go beyond the

European insurance scheme, for example by extending coverage and generosity. In other words, national governments can top up the basic European insurance scheme.

The "top-up" EUIS is different from the "basic" schemes in that it guarantees a minimum benefit, which includes all dimensions of the insurance. For example, it also refers to the duration of the benefits and the eligibility conditions. When the national scheme is sufficient to meet these requirements, the European scheme does not intervene. In the opposite case, the European scheme covers the difference by topping up the national scheme. In the study of *Delpla* (2012), this idea is translated as follows: workers can choose between the European and the national insurance scheme if the national scheme is more attractive.

These two types of schemes require different degrees of harmonization. Setting up a genuine European unemployment insurance requires a high degree of harmonization, as benefits are transferred directly from supranational authorities to citizens, requiring similar requirements, generosity, and deadlines for all countries. Such a mechanism would be difficult to set up and would require a high level of integration of economic and social policies. An equivalent European unemployment insurance system, or reinsurance system, would be designed as an addition to existing national systems, allowing national governments to fund unemployment benefits without changing national policy, since the scheme transfers to the country the amount needed to pay the benefits according to each national system. This will encourage countries to converge towards more generous national systems without the need for formal harmonization (*Thirion*, 2017). This mechanism, which is close to the US federal unemployment insurance scheme, seems more compatible with the heterogeneous domestic preferences of Member States in terms of social policy.

Focusing on the design of an "equivalent" system, three key options have been discussed in the literature and in the policy debate so far.

- A first option would be a common EMU-UI system that provides a basic level of insurance by partly replacing national unemployment insurance systems. Benefits from the euro area system could be topped up by additional payments from national unemployment insurance systems. Hence, there would be room for diversity across member states so that existing differences with regard to replacement rates and benefit duration could be preserved. The EMU-UI system would be financed by social insurance contributions with a contribution rate that could be uniform across Eurozone member states or country specific and time variant to restrict cross-country transfers. An important feature of such a scheme is that it would provide income insurance to the unemployed (under certain eligibility conditions) irrespective of the size of the unemployment shock in a given member state.

- As an alternative, a common scheme could provide income stabilization only in the event of large (unemployment) shocks. Such contingent unemployment benefits would be triggered if the level and/or change in overall unemployment has reached a pre-determined threshold in a given period. National unemployment insurance systems would still be in place in normal times.

- As a third option, the euro area unemployment insurance scheme could complement national systems by providing additional transfers which would either top up national benefits or kick in if national benefits expire. The payout rules of this scheme could be trigger based as well. Such a system would be comparable to the US unemployment insurance system where regular state benefits can be complemented by two types of benefit extension programs which are at least partly provided by the federal government, the extended benefit program (EB) and emergency benefits.

Both genuine and reinsurance schemes are always composed of a range of features that can take different values. Some of these features are found in national unemployment benefits schemes, while others are generally only present in the European schemes.

- The first thing policy-makers have to consider when designing a EUIS is eligibility. This includes who qualifies for benefits and the conditions that have to be met. In national schemes, eligibility depends on several factors, including the nature of unemployment (voluntary or involuntary), the employment (how long has someone worked, vis-a-vis a reference period) or unemployment record, personal characteristics (e.g. worker or self-employed), etc. Eligibility conditions determine coverage, and hence have an impact on stabilisation. They can be strict or easy to meet.
- A second element is the benefit amount: The amount of benefits that an eligible unemployed worker receives is often calculated on the basis of a reference wage (e.g. gross or net, last or average wage) to which a certain replacement rate and caps are applied. Yet, there are countries in which unemployment benefits are flat-rated.
- A third feature is the duration of the benefits: how long are benefits paid out and does this vary over time. In many national schemes, benefit duration depends on the case (e.g. related to the age of an unemployed individual). Another point is whether there is a waiting period before benefits are paid out.

All these features are used to determine the level and duration of benefits in the genuine schemes and to establish who is eligible. In the reinsurance schemes, these features apply as well: governments receive an amount of transfers that is sufficient to support unemployed individuals who meet the eligibility conditions with a benefit amount that is calculated according to these criteria for a pre-defined duration.

In addition to these features, a EUIS can have experience rating, claw-back and cyclical variability. Experience rating and clawback are two instruments that link the pay-in into the scheme to the use of the scheme. Experience rating works ex ante, while claw-back operates ex post. Experience rating ensures that countries that use the scheme more, or that have a higher probability of doing so, have to pay more into the scheme. Claw-back tackles long-term imbalances vis- a-vis the scheme. If Member States have a negative cumulative balance (i.e. they have received more than they have paid into the fund), the scheme can adjust this situation by increasing the country's pay-in or demanding a supplementary contribution

A.2 Triggering

One of the most critical design options of a EUIS is the trigger mechanism, which is composed of a trigger (or indicator) variable and a threshold. The trigger variable measures the magnitude of fluctuations in employment. It enters the activation rule determining under which circumstances a pay-out from the stabilization fund is triggered. Most proposals rely on indicators such as the unemployment rate or the short-term unemployment rate. A threshold value in the activation rule stipulates how large the size of the shock must be for a pay-out to be triggered. It can either apply to the quarter-on-quarter change in the trigger variable or to the deviation from its long-term moving average.

The first issue is the choice of the trigger variable. To ensure effectiveness, the capacity should be activated based on a transparent, certain and unbiased real-time measure of economic activity with limited ex-post revisions. In theory, the output gap is the most straightforward indicator of cyclical developments. However, several contributions to the literature note that the output gap is not an appropriate measure, regardless of its relationship to the business cycle, as it is unobserved and frequently modified (for example, see *Biggs and Mayer*, 2010; *Ince and Papell*, 2013; *Strauss et al.*, 2013; *Darvas*, 2015).[8] Furthermore, in a monetary union like the EMU, where the traditional adjustment mechanism (exchange rate) is lost and fiscal policies are constrained, the adjustment burden probably is on unemployment (*Pasimeni*, 2015). On the other hand, an unemployment based trigger appears as a viable pragmatic option for the activation of support. The unemployment rate has several valuable properties: it is well-known, harmonised, available at high frequency with short delays, and subject to limited revisions. It is an excellent indicator of the business cycle, purging some of the short-term noise of GDP. It reacts however with some lag to the business cycle. This may not be such an issue for a stabilisation function focused on large shocks. Moreover, the effects of shocks on public finances also tend to lag the growth cycle and actually to more or less match the unemployment cycle. A more significant potential limitation of the unemployment rate, however, is that its sensitivity to cyclical shocks may differ across Member States, for example because some economies have more developed working-time arrangements in downturns. Another technical consideration is the risk that the assessment of cyclical developments are affected by structural improvements in labour markets, but such effects appear limited empirically.

Table A.1 provides an overview of recent proposals on unemployment-based stabilization schemes. As shown in column 2, most proposals rely on the unemployment rate as indicator variable triggering payouts from the EUI fund (*Arnold et al.*, 2018; *Carnot et al.*, 2017; *Claveres and Stráskỳ*, 2018; *Dullien et al.*, 2017). Other contributions have proposed alternatives such as the short-term unemployment rate (*Beblavỳ et al.*, 2017), labour market variables capturing both intensive and extensive margin changes, in particular hours worked or the wage bill (*Bénassy-Quéré et al.*, 2018) or GDP (*Gossé et al.*, 2022). Moving next to the activation rule, column 3 reveals that some form of automaticity of payouts is present in all proposals. Payouts are triggered if the indicator variable in the activation rule is above its historical moving average (*Arnold et al.*, 2018; *Beblavỳ et al.*, 2017;

[8] Still, one has to keep in mind that output gap revisions could also result from changes in the methodology used to estimate them (e.g. methodological improvements) (*Enderlein et al.*, 2013).

Dullien et al., 2017), increasing (*Bénassy-Quéré et al.*, 2018), or only if both conditions are fullled (*Carnot et al.*, 2017; *Claveres and Stráskỳ*, 2018). Threshold values define how large the labour market shock must be for a payout to be triggered.

Table A.1: Trigger mechanisms in the literature

Author	Trigger variable	Activation rule
Arnold et al. (2018)	Unemployment rate	Unemployment rate above its 7-years moving average
Beblavỳ et al. (2017)	Short-term unemployment rate	Short-term unemployment rate above its 10-years moving average, thresholds: 0.1/1/1 p.p.
Bénassy-Quéré et al. (2018)	Unemployment rate, employment or wage bill	Year-on-year increase in unemployment rate / decline in employment by e.g. 2 p.p.
Carnot et al. (2017)	Unemployment rate	Double condition: year-on-year increase in unemployment rate and unemployment above its 15-years moving average; variants: different thresholds for year-on-year increase

Table A.1: Trigger mechanisms in the literature

Author	Trigger variable	Activation rule
Dullien et al. (2017)	Unemployment rate	1) payment from national compartment: unemployment rate above its 5-years moving average, threshold: 0.2pp. 2) additional payment from common department ("stormy day fund"): threshold: 2 p.p.
Gossé et al. (2022)	GDP	1) In the event of a recession in a country (two consecutive quarters of falling GDP) 2) In the event of a 1% fall in national GDP.

Finally, one relevant feature of a trigger mechanism is that it helps to deal with two of the most important intertwined challenges to a EUIS: moral hazard and permanent transfers issues. Moral hazard seems to be inevitable in a monetary union where financial transfers flow from one economic region to another, especially when regions have policy powers (*Grauwe*, 2003). Indeed, a mechanism that supports countries in a downturn may reduce their incentives to carry out reforms. While moral hazard cannot be avoided (*Vandenbroucke and Luigjes*, 2016), there are mechanisms that can be used to mitigate the issue. One mechanism that serves this purpose is a trigger, which has two components: an indicator and a threshold. If a scheme is conditioned by a trigger, it only becomes active in the event of a shock. In other words, when the indicator surpasses the threshold, the EUIS

transfers funds to the government. To rule out permanent transfers, (*Beblavý et al.*, 2015) argue that the indicator has to be tied to a rate of change in economic activity (e.g. the unemployment rate, so that every country can benefit) and that the threshold has to be sufficiently high (so that transfer are not permanent by definition).

A.3 Financing and size

A EUIS is also confronted with, at least, another two dimensions: financing and size. When it comes to the financing of the insurance scheme, four sources of finance have been suggested for the EUIS, also on the basis of the experiences of unemployment benefit schemes in federal countries: a payroll tax, a corporate tax, a contribution paid by member countries defined as a percentage of GDP and not linked to a joint ad hoc tax, and debt.

The payroll tax – used in the EUIS proposed by *Dullien* (2013, 2014) – and the corporate tax (*Pisani-Ferry et al.*, 2013) have the advantage of creating a 'genuine' unemployment benefit scheme, in the sense that they generate a system that works as insurance at a microeconomic level, where the worker or the employer pays a contribution that is directly linked to the assistance the worker will receive in the event of remaining unemployed. These financing schemes would also endow the Commission with a budget that is directly related to a well-defined source of revenue.

In the case of reinsurance schemes, in which transfers flow to the national government when the scheme is triggered (*Italianer and Vanheukelen*, 1993; *Beblavý and Maselli*, 2014; *Dolls et al.*, 2014), the scheme is financed through Member States' contributions. These contributions are expressed as a percentage of the country's GDP, either fixed or variable. This does not mean that payroll and corporate taxes cannot be used as a way to finance an EUBS. In fact, defining the payment as a percentage of a country's GDP is a very general way of defining the country's pay-in, which can coincide with a payroll or corporate tax if the member countries agree that this is the way the national contribution should be collected. In the absence of such an agreement, defining the contribution as a sum relative to GDP leaves member countries free to decide how to collect the necessary resources. In the latter case, the EUBS works as insurance between countries (a so-called 'equivalent system').

Finally, the issue of debt is more controversial, because it would imply the ability of the fund to issue supranational bonds and while debt-issuing has been discussed in many papers, a consensus has yet to be reached on the desirability of this financing channel. Nonetheless, there are important arguments in favour of debt (e.g. *Dullien*, 2013). A first argument is that debt-issuing is essential to deal with large, symmetric shocks, when the scheme likely has insufficient funds. Raising contributions or taxes at this time would put even more pressure on Member States that are already struggling. Such a strategy would weaken stabilisation and is pro-cyclical instead.

In designing an EUIS, it is necessary to think also about the potential size of the scheme in terms of GDP. This is clearly related to the stabilisation effect that one would wish the EUIS to have, which would seem to draw very wide boundaries since different scholars and policy-makers have had very different views in this respect. However, these boundaries are considerably narrowed by the fact that national unemployment benefit schemes are already in place, and it is difficult to

imagine that the EUIS would be much more generous or restrictive than the systems already in place. A simple example of this is given by *Italianer and Vanheukelen* (1993), who estimate the hypothetical annual costs of the EUIS by multiplying the number of unemployed individuals by the average EU wage and then by a replacement rate set at 70%. The result is that the EUIS would cost 0.5% of GDP, which is within the range of costs estimated by later literature.

More recent simulation studies typically set an EUIS with a given duration of unemployment benefits, a replacement rate determining the size of the benefits relative to a reference wage, and a coverage rate (the proportion of unemployed individuals who would receive benefits). These parameters are chosen to be roughly in line with those in place in some EU countries (typically, the median country). Once these parameters are chosen, the size of the EUBS is estimated based on these choices. Most simulation studies set the maximum duration to 12 months (*Dullien*, 2007, 2012, 2013; *Beblavý and Maselli*, 2014; *Dolls et al.*, 2014), the replacement rate at 40% or 50% (*Dullien*, 2007, 2013; *Beblavý and Maselli*, 2014; *Dolls et al.*, 2014; *Jara and Sutherland*, 2014; *Beblavý et al.*, 2015), and the coverage rate at 75% or 80% (*Beblavý and Maselli*, 2014; *Beblavý et al.*, 2015) unless it is computed endogenously according to other rules (*Dullien*, 2013; *Dolls et al.*, 2014; *Jara and Sutherland*, 2014).

Dolls et al. (2014) suggest a genuine scheme with no trigger, and the estimated annual cost for the euro area is around €50 billion per year (0.6% of GDP). An upper bound to the EUBS cost is given by **?**, who assume that the scheme would cover all the unemployment benefit costs incurred by member countries, which on average for the period 2002-2010 equalled 1.8% of GDP in the euro area. *Dullien* (2007, 2013) defines different scenarios, with an annual cost varying from 0.75% to 0.85% of euro area GDP (*Dullien*, 2007) or between 0.3% and 0.6% of EU GDP (*Dullien*, 2013).

However, some simulation studies incorporate a trigger in their EUIS to limit when the payment is made. Since the claim (the amount sent to a specific country after the conditions are met) still follows the framework of the median country, but the transfers only take place in specific situations, the EUIS is significantly less expensive as a result. For example, under the scenarios in which the trigger conditions are most restrictive, *Beblavý and Maselli* (2014) estimate the average hypothetical cost of their EUIS scheme between 1999 and 2012 to be 0.07% of EU GDP (the average cost is close to 0.3% in their least restrictive scenarios).

Table A.2 summarises the main options in the literature in terms of the size (pay-out) and contributions of the simulated EUIS. All in all, across the literature, estimates of the size of a EUIS appear to vary between 0.3 and 0.85 % of EU GDP. In the US, the cost of regular benefits was estimated to be in the range of $40.5 billion in 2014, which is equivalent to 0.23% of GDP (*Whittaker and Isaacs*, 2014).

Table A.2: Pay-out and contribution rules in the literature

Author	Pay-out rule	Contrubution rule	Borrowing
Arnold et al. (2018)	0.5% of GDP for every 1 p.p. deviation in the unemployment rate above its 7-years moving average; variants: higher/lower transfers rates	0.35% of GDP per year; variants: higher/lower contribution rates; experience rating	Yes

Table A.2: Pay-out and contribution rules in the literature

Author	Pay-out rule	Contrubution rule	Borrowing
Beblavỳ et al. (2017)	Pay-out equals sum of unemployment benefits paid to the short-term unemployed according to the rules of a hypothetical genuine EUBS	0.1% of GDP per year until 0.5% of EU GDP is accumulated; some variants with experience rating/claw-back	Yes
Bénassy-Quéré et al. (2018)	One-off transfer of a fixed percentage of GDP (0.25%) for each p.p. increase in unemployment/decline in employment beyond the specified threshold	0.1% of GDP per year; experience rating	No
Carnot et al. (2017)	0.5% of GDP per percent increase in the unemployment rate, variants: higher payouts.	Double condition: year-on-year decrease in unemployment rate and unemployment below its 15-years moving average; variants: different thresholds for year-on-year decrease; 0.5% of GDP decrease in unemployment; experience rating.	Yes
Dullien et al. (2017)	1) national compartments: 25% of average wages paid per employee 2) common compartment: transfers becoming proportionally bigger the larger the increase in unemployment.	0.1% of GDP per year; 80% into national compartment, 20% into common compartment; experience rating	Yes
Gossé et al. (2022)	25% of average net wage times the number of unemployed	0.24% of real disposable income of households. In addition, when transfers are activated, the contribution rate is set to 0%.	Yes

A.4 Modelling options

Regarding the methodological approaches for simulating a EUI, three approaches have been used to simulate the effects of the introduction of a European unemployment insurance: they concur on the smoothing potential of such a mechanism, despite methodological and calibration differences.

- The first is based on DSGE models.[9]. In a two-country business cycle model with incomplete financial markets and frictional labour markets, *Moyen et al.* (2019) show that optimal risk-sharing via a supranational unemployment insurance increases the counter-cyclicality of replacement rates compared to the decentralised setting. Simulation results based on a calibration to the euro area's core and periphery suggest significant distributional effects via the un-employment insurance system. *Ignaszak et al.* (2020) model a monetary union with a role for a federal unemployment transfer system. As member states control regional labour-market policies, there is a trade-off between stabilisation and moral hazard. *Enders and Vespermann* (2021) also simulate the effects of a cross-regional fiscal transfer mechanism, where they show how welfare effects depend on different types of shocks. *Kaufmann et al.* (2023) use a medium-scale DSGE model to quantitatively assess the macroeconomic stabilisation properties of a supranational unemployment insurance scheme. The model is calibrated to the euro area's core and periphery and features a rich fiscal sector, sovereign risk premia and labour market frictions. Adopting both simple policy rules and optimal policies for the centralised insurance scheme, our simulations point to enhanced business cycle synchronisation and inter-regional consumption smoothing. Finally, *Abraham et al.* (2023) study the welfare effects of both existing and counter-factual European unemployment insurance (UI) policies using a rich multi-country dynamic general equilibrium model with labour market frictions. They find that mechanisms like SURE, which allows national governments to borrow at low interest rates to cover expenditures on unemployment risk, yield sizeable welfare gains.

- A second, more empirical approach, uses microeconomic data to calculate the smoothing effect on household consumption of a European unemployment insurance system, as well as the redistributive effects of such a system between individuals and between countries. By simulating a replacement rate of about 70% partly insured at the European level, *Dolls et al.* (2018) manage to smooth income fluctuations at the European level by 10% on average between 2000 and 2013, and obtain very variable gains across countries. Such an approach allows for a fine-grained analysis of individual gains, but masks general equilibrium effects.

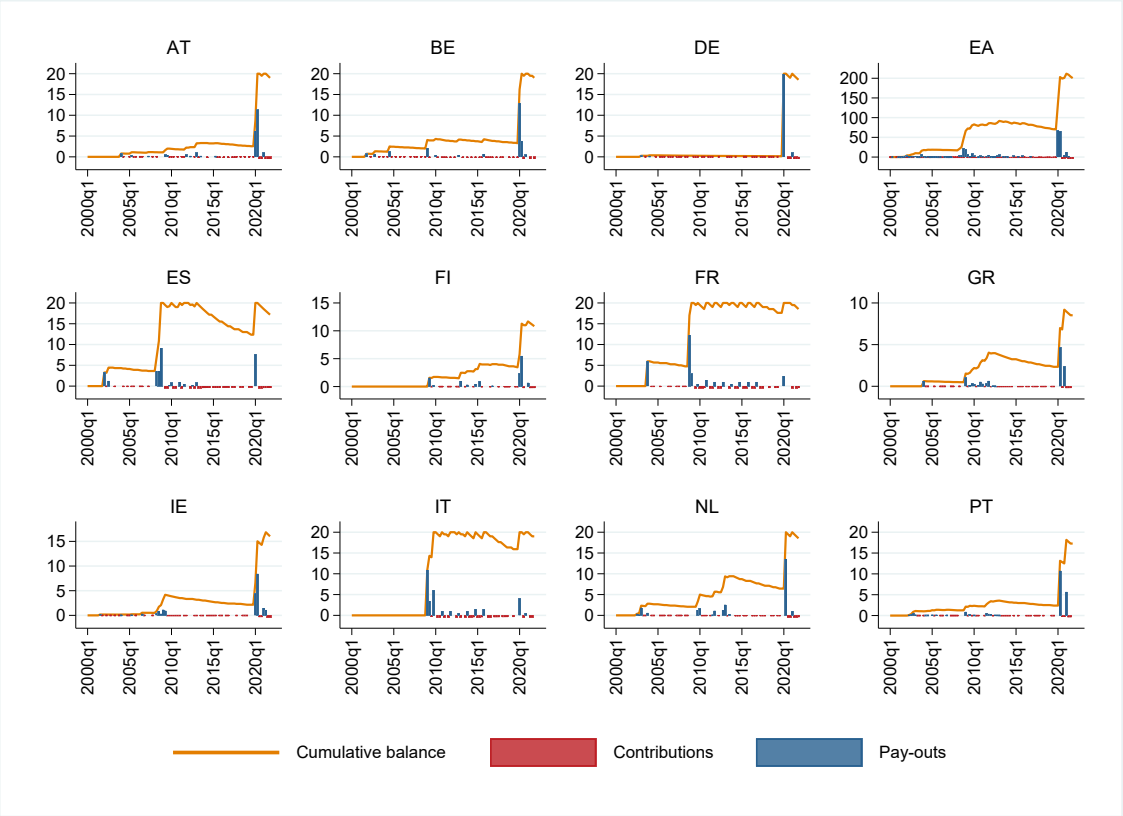
- The third approach uses macroeconometric simulation models to assess the effect of a European unemployment insurance, which allows for a quantitative analysis of general equilibrium effects and feedbacks between countries. *Fichtner and Haan* (2014), for example, study an insurance system close to a true system using the NiGEM model in which they assume that a part of the unemployment expenditure is financed at the European level, thus increasing national public expenditure by the same amount. They show that harmonising and taking over part of the national unemployment insurance systems at the euro area level would have significantly reduced the drop in GDP during the crisis in some countries.

[9] Dynamic Stochastic General Equilibrium models are used to assess the macroeconomic impact of monetary or fiscal policy

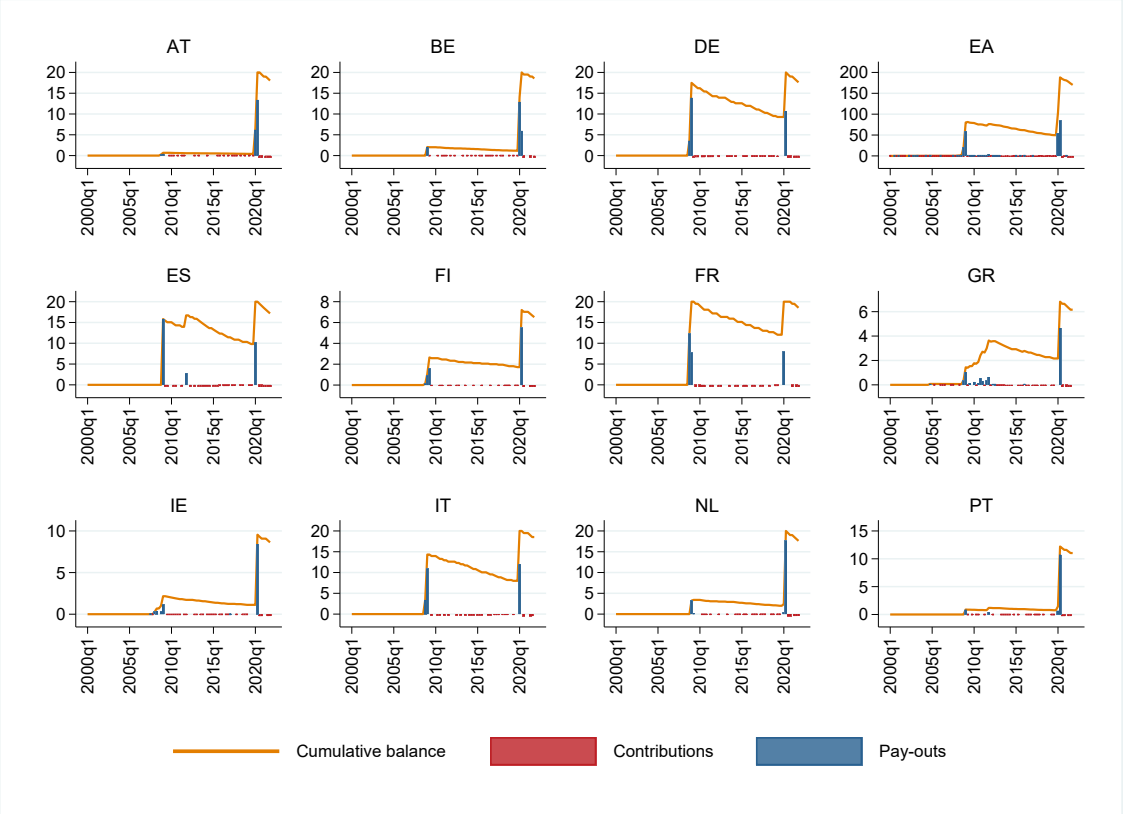
B Additional figures and tables

Figure B.1: Pay-outs, contributions and cumulative balance by country (Billions)

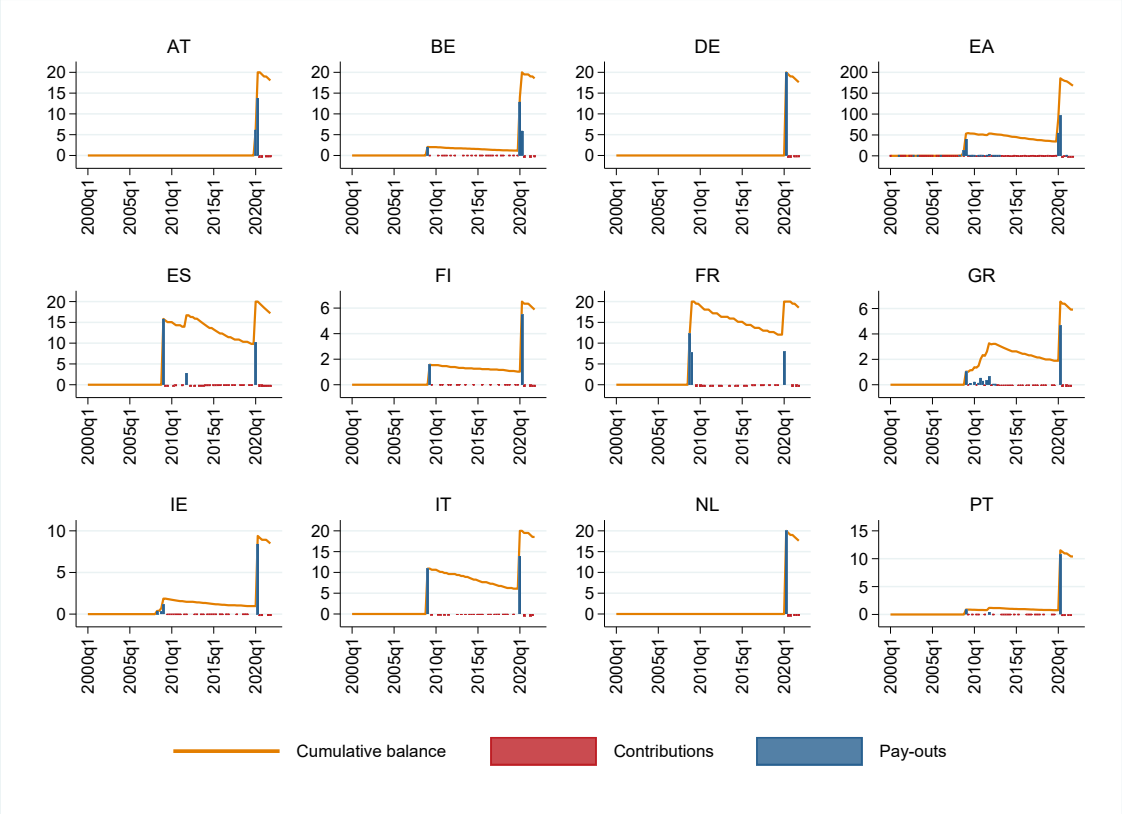
(a) Trigger 1



(b) Trigger 2



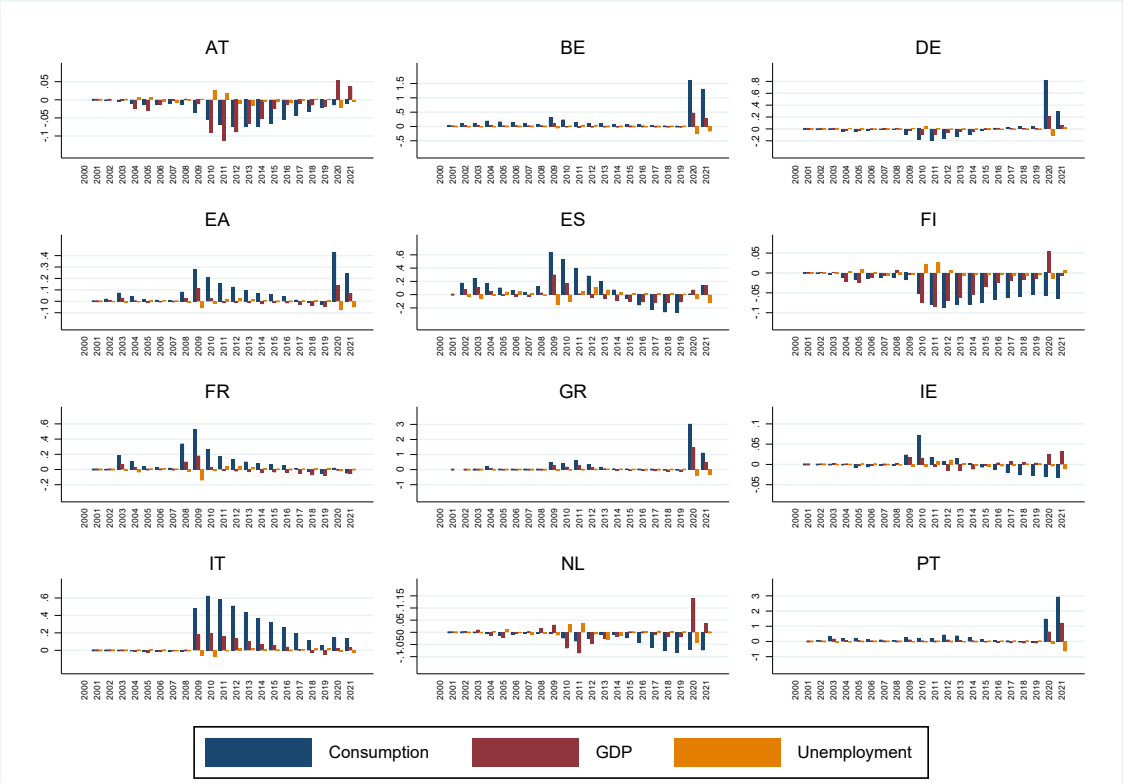
(c) Trigger 3



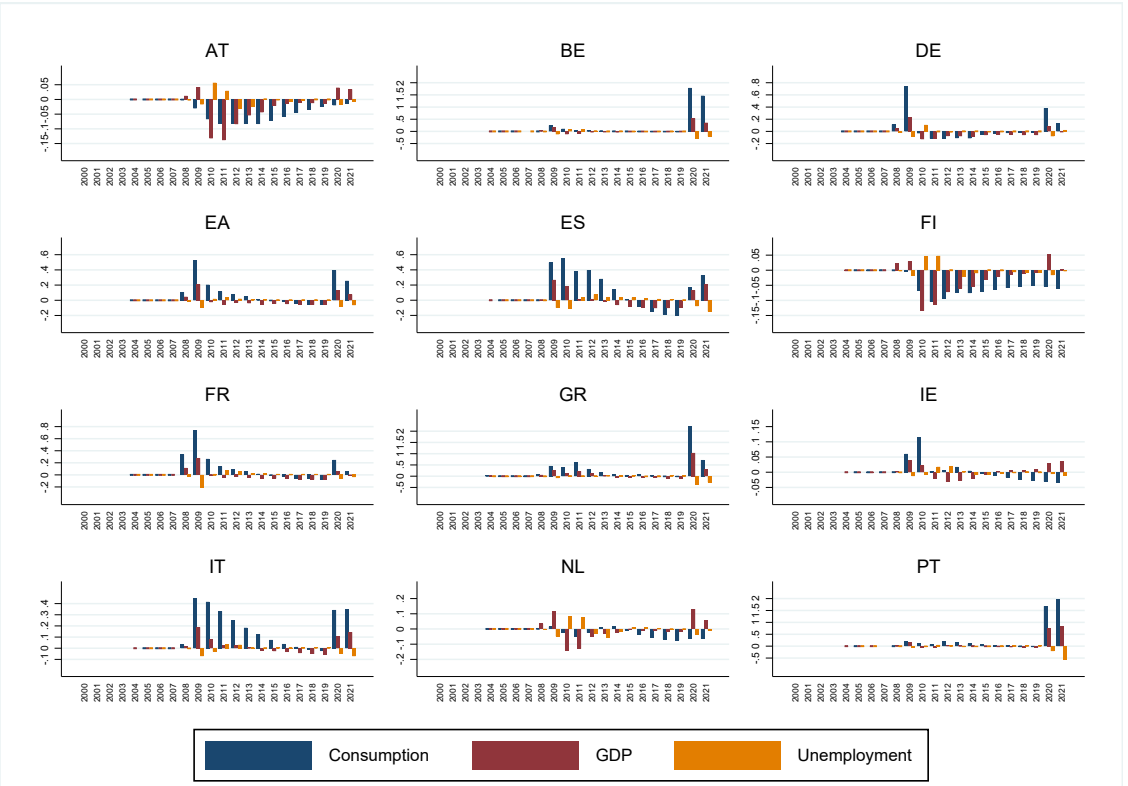
Source: Author's own calculations based on NiGEM model

Figure B.2: Counterfactual gain/losses in consumption, GDP and unemployment (%)

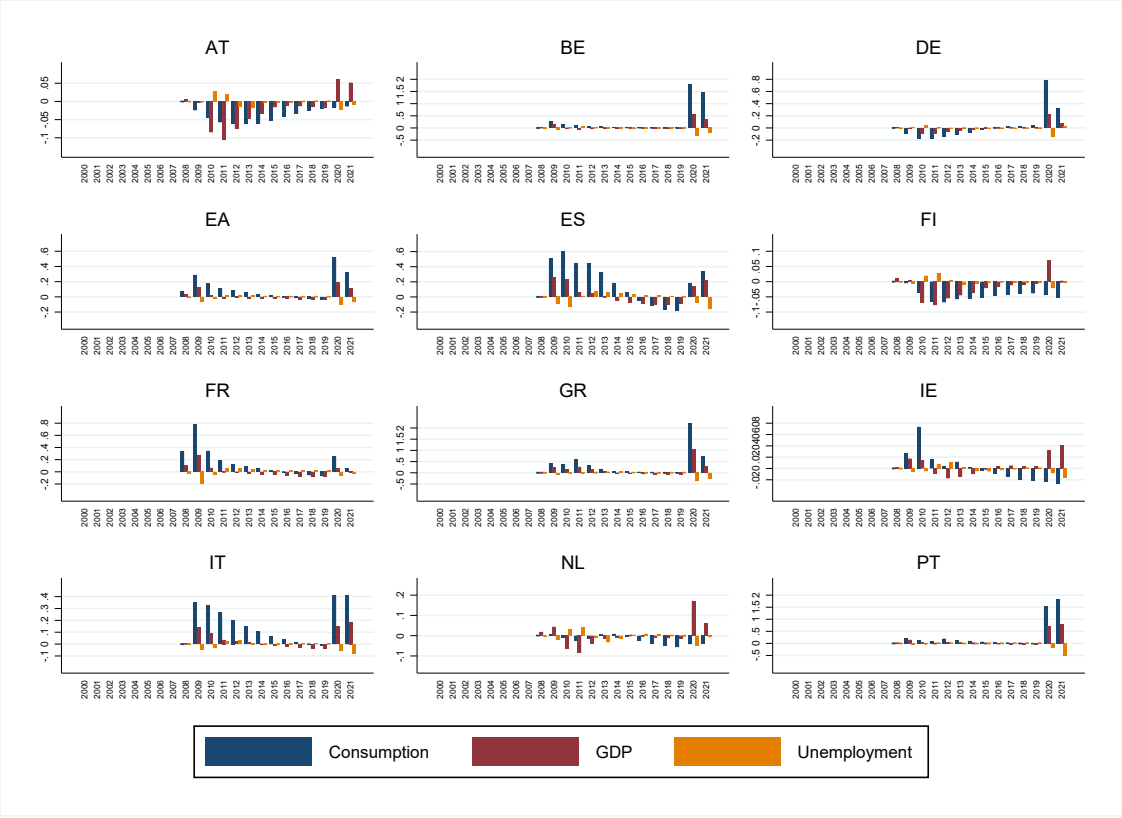
(a) Trigger 1



(b) Trigger 2



(c) Trigger 3



Source: Author's own calculations based on NiGEM model

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