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The EMU after the Euro Crisis: Lessons and Possibilities

Findings and Proposals from the Horizon 2020 ADEMU project

Edited by Ramon Marimon and Thomas Cooley

A VoxEU.org Book

CEPR Press

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ADEMU

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Foreword

In the last few years, the persistent aftermath of the euro area crisis has proved to be a lasting test for the European Economic and Monetary Union (EMU). But how member states have responded has depended substantially on individual political sentiment. The right path forward for the euro area as a whole cannot be forged without a clear understanding of the heterogeneities between member states, of the EMU framework, and of its role in strengthening the EU.

This eBook is the culmination of the European Commission's Horizon 2020 ADEMU (A Dynamic Economic and Monetary Union) Project, led by the European University Institute and encompassing the work of economists from the Barcelona Graduate School of Economics, Católica Lisbon School of Business & Economics, CERGE-EI, Toulouse School of Economics, Universität Bonn, University College London, and the University of Cambridge. Through a range of events and research production, the ADEMU Project has brought together academics and policymakers from these and other institutions to better understand the euro crisis and the role of the monetary union, and draws clear policy lessons for member states.

The authors make two clear proposals as a result. The first is to use a European Stability Fund – an expanded European Stability Mechanism – as a constrained mechanism to improve risk-sharing across heterogenous member states. The second is a European Unemployment Insurance System, to introduce a congruent system of unemployment insurance across different euro area labour markets. Both proposals reinforce the role of the EU as a partnership of diverse member countries.

CEPR thanks Ramon Marimon and Thomas Cooley for editing this eBook, and Anil Shamdasani and Sophie Roughton for its excellent production. CEPR, which takes no institutional positions on economic policy matters, is delighted to provide a platform for an exchange of views on this topic.

Tessa Ogden
Chief Executive Officer, CEPR
April 2018

Introduction

Ramon Marimon and **Thomas Cooley**
European University Institute, UPF - Barcelona GSE and CEPR; New York University, Stern School of Business

The 2008 financial crisis took most governments and international institutions and agencies by surprise. The European Commission was no exception; in particular, its 7th Framework research funding programme did not contemplate funding research on financial crises or, more generally, economic crises or recessions (Ramon Marimon, one of the authors of this Introduction, was then on the Advisory Committee for Social Sciences and Humanities of FP7). It was not until the first call of the following Framework programme – the Horizon 2020 Programme – in 2014 that such research was properly funded, with a specific call for research on "[*O*]*vercoming the Crisis: New Ideas, Strategies and Governance Structures for Europe*" (H2020-EURO-SOCIETY-2014). This seemed to be a call that European macro research economists could not ignore, since by 2014 research in this area was blooming and, in response to the euro crisis, the overall fiscal and monetary framework of the EMU was being revamped and further developed. The ADEMU project, aimed at linking "the supply of new ideas" and "the demand for reassessing the fiscal and monetary framework of the EMU", was a successful applicant to that call.

This VoxEU-ADEMU eBook provides an abridged overview of research that has been conducted under the ADEMU project. In this Introduction, we very briefly summarise the twelve chapters that follow. As usual, the views expressed in each chapter are those of their authors, but they usually reflect ADEMU research conducted by themselves and others, as well as discussions in conferences, workshops and other ADEMU activities.

Lessons from the euro's first twenty years

The first chapter, by Giancarlo Corsetti, draws important lessons from the first twenty years of the euro while emphasising the problems – i.e. what deserves to be studied and what needs to be corrected. He essentially argues that the failure to properly assess risks (in other words, risk misperceptions) resulted in misallocations of resources, both in the expansion and in the recession (the two flip sides to the euro crisis). He examines four worrisome features: (i) diversity, a positive characteristic of Europe, becoming (a negative) polarisation (something to which, he hypothesises, the euro area has contributed); (ii) the amplification effects underlying recessions (a topic also discussed in Chapters 4 and 5 of the eBook); (iii) the 'diabolic loop' linking public and private liabilities; and (iv) the risk 'stressed' countries ran of experiencing an even more severe self-fulfilling crisis (i.e. a crisis driven by pessimistic beliefs about the future of the euro area). But Corsetti also recognises the stabilising role played by the ECB, from 2012 onwards, and by the ESM. Specifically, he reports on his ADEMU research into the successful lending practices of the ESM, beyond the standard practices of the IMF. As he stresses, this is not simply a happy ending to the story, since the legacies of the euro crisis remain (including the excessive accumulated debt and the polarisation) and the EMU needs to be more resilient in order to stabilise large recession shocks and, more generally, to properly pursue stabilisation policies. These are the issues discussed in the remaining chapters of this eBook.

The EMU's capacity for risk sharing and economic stabilisation

The next two chapters focus on one of the two weakest economic dimensions of EMU in 2018: its risk-sharing and economic stabilisation capacity (the other is its incomplete Financial Union). Both chapters refer to macro quantitative projects that have been developed over the past three years, resulting in the two main ADEMU policy-institutional recommendations for EMU. In Chapter 2, based on Ábrahám et al. (2018a), Ramon Marimon shows how the currently debated European Stability Fund can be designed as a *constrained efficient risk-sharing mechanism,* not only providing risk sharing and stabilisation in normal times, but also acting as an efficient

crisis-management mechanism. Had this mechanism already been in place, the euro crisis would have been less severe and long lasting, and the mechanism would now be an effective financial tool with which to confront the 'debt overhang' problem, transforming risky non-contingent defaultable debts into riskless constrained contingent debt contracts, without mutualising them.

In Chapter 3, based on Ábrahám et al. (2018b), Árpád Ábrahám, João Brogueira de Sousa, Ramon Marimon and Lukas Mayr study another currently debated issue: should the EU (or a subset of its countries) develop a common unemployment insurance (UI) system, possibly complementary to the national UI schemes? To address this issue, the authors develop a dynamic general equilibrium model with search frictions to show how differences across European labour markets – for example, the different distributions across 'employment, unemployment and inactivity' – can be summarised using a few parameters determining, for example, job creation and destruction. This provides a novel picture of European labour markets which allows the authors to test what the possible risk-sharing gains of a common UI scheme are and, more specifically, whether European countries – that is, the properly weighted employed, unemployed and inactive agents of each country – would agree to a common design for a European UI system. Almost to the authors' surprise, they find that the answer is yes.

New models for understanding recessions and optimal policy responses

The next two chapters have a common theme: the development of new dynamic macroeconomic models that can enlighten our understanding – beyond standard classical real business cycle and New Keynesian representative agent models – of recessions and, therefore, of optimal policy responses. Both relate to the recent macro literature (e.g. Huo and Rios-Rull 2018) – and build on ADEMU research that contributes to this – which studies economies with heterogeneous agents and frictions, where demand and supply effects are intrinsically related and must be accounted for in the design of economic policies. Chapter 4 by Morten Ravn builds on his work with Vincent Sterk emphasising the possible – and empirically relevant – increase in endogenous earning risk in times of crisis, which may trigger long-lasting recessions or 'liquidity

traps', even with positive inflation. In this context, more reactive fiscal and monetary stabilisation policies are needed than those postulated by New Keynesian models with homogenous agents.[1]

Chapter 5 builds on the recent work of the authors, Paul Beaudry, Dana Galizia and Franck Portier, which emphasises the fact that the last US and euro recessions may not have been unique in having followed a relatively long expansionary period and lasting longer than 'standard' real business cycle crises (Beaudry et al. 2016, 2018). In their model, the interplay of Keynesian 'deficient aggregate demand' and Hayekian 'excessive supply of capital' (e.g. housing) gives rise to (locally) unstable business cycles. In this context, stimulating demand is desirable, but a simple Keynesian dictum of 'increasing aggregate demand' may be counterproductive, given the Hayekian effect.

Resilience through fiscal policy

Part of the economics research that has 'bloomed' with the crises has revisited the literature on *fiscal multipliers*, paying special attention to their role during recessions and fiscal consolidations (e.g. Pappa *et al.* 2016). Ferriere and Navarro (2018) show that in an economy with heterogeneous agents the effect of government spending policies crucially depend on the progressivity of the taxes that finance the expenditure; in particular, the more progressive they are, the larger the effect. Similarly, Hagedorn et al. (2018) show that in a HANK model the fiscal multiplier can be quite large – larger in a 'liquidity trap'– and very sensitive to whether government expenditures are financed by taxes or debt.

Many stimulus packages experimented with during the euro crisis were based on the belief that the right positive multipliers would 'do the work', but in fact they did not (for example, in the case of Spain's €11 billion stimulus package in 2008). Chapter 6 by Martial Dupaigne and Patrick Fève builds on their work showing why (Dupaigne and Fève 2016). They provide a characterisation of multiplier effects and show that to have a positive effect on investment and not only on consumption, stimulus packages must

1 See also Beaudry and Portier (2018).

be persistent, which makes them predictable for private investors. In other words, the Hayekian effect can be offset, and even reverted, if the new investment opportunities are stimulated with the package. Unfortunately, in periods of fiscal consolidation there is no time for persistent stimulus, and stimulus packages may only amplify excess capital (as happened with public construction works in Spain during 2008–2010).

Fiscal policy and, in particular, the design of tax policies and their coordination has been another area of ADEMU research. Chapter 7 by Pedro Teles provides an overview of this work and shows its scope and relevance for the EMU, from its theoretical foundations underlying the role of limited commitment (the focus of work by Patrick Kehoe and co-authors and a theme revisited in Chapter 12), to the key, yet neglected, topic of optimal taxation policy in the global economy (Chari et al. 2017). This work offers an important policy insight: to preserve free trade, value added taxes should be used (with border adjustments, if needed), not capital income taxes as is being done now in most European countries. Looking ahead, the chapter concentrates on a possible new tax that has already been discussed in the European Parliament, namely, a tax on automation.

The main part of Chapter 7 is based on Teles' joint work with João Guerreiro and Sergio Rebelo (Guerreiro et al 2018). A first result is that according to optimal taxation theory, since robots are an intermediate good they should not be taxed. This may be reinforced if the net employment effect is positive.[2] However, compensating losers may not be easy, even if there is an estimated positive effect – for example, in European countries that are 'digital front-runners' (McKinsey&Company 2017) – and even more so if the net effect is not positive (in the EU on average, for example, or in the southern EU in particular). Their main result is that when optimal taxation theory takes into account that people cannot be taxed differently – say, because they do a routine job – then it may be optimal to tax robots, and under plausible conditions it is optimal. Incidentally, based

2 The McKinsey&Company report concentrates on Europe's 'digital front-runners' and for these countries estimates that 'digital technologies' had a positive balance between job creation and destruction of around 80,000 jobs a year (1999–2016). It also estimates, for a 2030 horizon, a 1.2% GDP per capita growth increase due to automation.

on the new developments of optimal taxation theory, Teles also vindicates "progressive taxes with a universal transfer" as a way of minimising redistribution costs, another controversial issue raised, for example, in the European Parliament.

Financial markets and stability

The next two chapters focus on financial markets. Chapter 8 by Hugo Rodriguez Mendizabal focuses on the Banking Union and the role of the ECB in financial markets. At the end of the chapter is a figure that is by no means new, but is still disturbing, showing as it does how fragmented EU financial markets remain ten years after the 2008 financial crisis. It reinforces the warnings and recommendations coming out of the ADEMU research by economists and law scholars which Rodriguez summarises. More specifically, on the design of the European Banking Union, ADEMU work emphasises the delicate trade-off between a fully credible design for the Single Resolution Mechanism (SRM), which requires a large (private) fund capacity, and a bank's profitability; on the ECB, it emphasises the weak legal basis of its role as Single Supervisory Mechanism (SSM). Regarding the European Deposit Insurance Scheme (EDIS), instead of dwelling on the standard argument that 'it should be done to complete the Banking Union' (i.e. on a par with other banking unions, such as in the US), Rodriguez proposes moving towards narrow banking as a more effective 'moral hazard-free' path, one of the requirements for which the ECB has already facilitated.[3] The chapter also surveys ADEMU research on the different roles of the ECB: the optimal choice of transparency in supervision, and the important role it played in monetary and financial stability during the euro crisis (albeit limited by not being able to take risks, as the Federal Reserve Board was able to do with its Term Asset-Backed Securities Loan Facility, counting as it could on the financial backup of the US Treasury).

Chapter 9 by Radim Boháček focuses on the role of macroprudential policies in helping to achieve financial stability, providing an overall perspective of the literature to which ADEMU research has contributed: experimental and theoretical work on macroprudential policies targeting excessive leverage; the important role that *funding liquidity* (i.e.

3 This recommendation is based on Rodríguez Mendizábal (2017).

funding against collateral) has played in euro area financial crises (for example, in Ireland); the possible misallocation of resources due to differences in asset liquidity; the role of procyclical macroprudential capital controls in alleviating overborrowing; the role of international cooperation in designing effective macroprudential policies; the weak effect of attempting to reduce mortgage debt with inflation; and the role of intermediation costs in explaining observed asset price patterns.

EMU reforms from a legal and political economy perspective

Chapters 10 and 11 provide a 'legal' and a 'political economy' perspective, respectively, to ADEMU research. Chapter 10 by Giorgio Monti provides a critical assessment, from a legal perspective, of the different proposals concerning the possible reform of the European Stability Mechanism. In particular, it discusses the contrasting 'German' and 'French' political visions and the specific proposal of the European Commission (2017). In doing so, it refers to some of the ADEMU research done by its LAW team (also reflected in Chapter 8). Neither the 'German' vision (transferring the surveillance of the Stability and Growth Pact from the European Commission to the ESM and extending the ESM mandate) nor the 'French' view (transforming the ESM's current 'crisis-resolution mechanism' function into an IMF-style institution able to provide 'preventive funding') seem to be implementable without a revision of the EU Treaties. Therefore, Monti turns to the Commission proposal, which aims to transform the ESM into a 'Union body'.[4] Unless new specific functions for the ESM (aside from its eventual role as 'back-stop facility' for the Single Resolution Mechanism) can be found, there does not seem to be much need for anything other than a possible reform of the ESM Treaty.

4 A term used by René Smits in his ADEMU Perspective #No. 8 (ADEMU Newsletter, November 2017), which also provides a legal perspective on this and other EMU issues.

Chapter 10 does not discuss the European Stability Fund (ESF) proposal presented in Chapter 2,[5] but the 'pragmatic approach' of reforming the ESM Treaty is consistent with the ESF proposal to transform current ESM contracts into ESF contracts (see also Chapter 12).

Chapter 11, by David K. Levine and Andrea Mattozzi, does not enter into the often-discussed political issues of the EMU (for example, in reference to Chapter 10, the underlying political trade-off between enhancing the role and capacity of the ESM and making the ESM a 'Union body', and keeping the supervisory role in the Commission). Rather, the authors take a step back not only to focus on deeper EU political economy concerns, but also to discuss their work developing the corresponding political economy theory. In particular, they focus on three related aspects: rent seeking in the banking sector, the potential capture of regulatory institutions by collusive groups (e.g. lobbies), and the trade-off between disruptive and collusive behavior in collusive groups.

Conclusion: The EMU's fiscal and monetary framework

The concluding Chapter 12, by Ramon Marimon, goes back to the original aim of the ADEMU project "to reassess the overall fiscal and monetary framework of the EMU". It takes the *Presidents' Reports* (Van Rompuy et al. 2012, Jucker et al. 2015) as the benchmark 'roadmap' and provides a brief assessment of the three EMU unions (Monetary Union, Economic and Fiscal Union, and Financial Union) in 2018, based on the experience of recent years and on ADEMU research. Both the EMU experience and the theoretical and empirical research of ADEMU and other economists and legal scholars consistently emphasise the important role of the EMU institutions – in particular, the ECB and the ESM – in the resolution of the euro crisis and the need to further strengthen the resilience of the EU to other (in part self-indulged) recessions. This translates into making the Economic and Fiscal Union more capable of credibly satisfying its role of guaranteeing economic stability and completing the Financial Union. This view is compatible with different degrees of European Union integration.

5 A legal assessment underway by the ADEMU-LAW team.

In fact, the ADEMU project has taken the view that the role of social scientists is precisely that of submitting existing policies and proposals to scrutiny and, if possible, proposing new ones that may better accomplish stated objectives, such as 'economic growth and stability'. The main institutional proposals of ADEMU – presented in Chapters 2 and 3 and further discussed in Chapter 12 – are possible, consistent and implementable designs (founded on research), and it is up to others to decide whether, or to what degree, to implement them. If they are taken on board, ADEMU research has also provided tools to develop the required engineering work.

As said at the beginning of this Introduction, this eBook does not cover all of the research that has been conducted under the ADEMU project, and more information on this, as well as on ADEMU's activities in its three years of existence, can be found on the project's website. But in the same way that EMU is not complete, and in a sense will never be, many questions raised by the EMU experience and by ADEMU research remain open. Unfortunately, the European Commission is not contemplating the possibility of providing further funding, but we see PhDs and post-docs producing *New Ideas* and we are confident that ADEMU research will continue.

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1 Lessons from the euro crisis an dealing with its debt overhang

Giancarlo Corsetti
Cambridge University and CEPR

Introduction: Country risk in the euro area crisis

Looking back at the first twenty years in the life of the euro, it is apparent that the institutions and policies in the euro area have failed to prevent both the gross underestimation of (country, private and public) risk during the first decade, and the magnification and polarisation of risk along national borders during the second decade. While the initial underestimation of risk was not specific to the euro area, risk polarisation was arguably a key unique feature of the euro area crisis. Understanding the root of this risk polarisation, and which steps can be taken to ensure that the euro area is not systematically vulnerable to this kind of crisis, has been a priority of ADEMU.

To put it simply, a monetary union among independent states cannot be built on the illusion that there are no sovereign risk differences. But it cannot be stable and well-functioning without credible institutions and policies to anchor risk differentials to fundamentals, letting country risk systematically magnify shocks and cause divergence of borrowing costs of government firms and households across borders.

Country risk polarisation has weighed heavily on the euro area's recovery from the crisis. First, it has reduced the effectiveness of monetary policy. Policy rate cuts and other measures by the ECB could not be fully transmitted to (and thus reduce) borrowing rates in high-risk countries – rates remained volatile per effect of country risk. This consequence of polarisation has constantly fed disagreement among member state on the appropriate monetary stance at the union level. Second, risk polarisation has reduced the scope for fiscal policy. On the one hand, governments in crisis countries

faced the need to adopt pro-cyclical austerity measures in the middle of a downturn and maintain a contractionary stance throughout the recovery (if any). On the other hand, governments in low-risk countries had an incentive to keep the budget relatively tight in order to maintain their low-risk status (and with this, very low borrowing costs). As a result, the aggregate macroeconomic stance of the euro area has remained insufficient, and the area has experience a slow recovery on average, even though some individual countries performed quite well by international standards.

For the euro area as a whole, debt is not much higher than for other large industrial countries and/or macro regions in the world. However, as a result of risk polarisation, the debt distribution in the region is heavily asymmetric. Today, the burden of debt is higher where employment and economic activity are still far from satisfactory (or even below pre-crisis levels) and fiscal and financial risks are still high.

In the absence of effective corrective measures at both the national and euro area level, debt overhang is likely to cause the existing differences to persist for a long time into the future. In crisis countries, high sovereign debt and risk foreshadow higher taxes and lower provision of public goods. This in turn discourages domestic investment and economic activity, exacerbating inequality (e.g. Brinca et al. 2017) and even fostering the migration of (skilled) labour (e.g. Bandeira et al. 2017). Debt overhang thus weighs heavily on the success of budget correction policies and reforms (Müller et al. 2016).

In this chapter I will first discuss the work of ADEMU on the roots of the country risk crisis in the EU, and then delve into three issues relating to strengthening the euro area's ability to address the problem. The first is the need for a monetary backstop, largely satisfied by the launch of the Outright Monetary Transactions programme by the ECB in 2012. The second is the still largely open question of how to stabilise large recessionary shocks, if and when they occur in the future. The third is the rationale and scope for relying on an official lending institution to enhance debt sustainability in Europe, as a way to support debt deleveraging in the continent.

Beyond OCA theory: Learning the costs of an incomplete monetary union

The traditional theory of optimal currency areas has long called attention to the fact that joining a monetary union requires independent countries to give up autonomous monetary instruments of stabilisation *and* a key margin of adjustment, namely, the exchange rate. This loss may be more or less costly depending on key conditions concerning the scope and effectiveness of fiscal policy, capital market development, factor mobility, wage and price flexibility, and the symmetry of business cycle shocks. The influence of this theory on the policy debate cannot be emphasised enough (see the modern reconsideration by Chari et al. 2016 and Corsetti et al. 2016a). However, it is fair to say that this theory falls short of providing effective guidance for understanding the depth and nature of the country risk crisis in the euro area.

Especially when the shocks bring the policy rate to its effective (zero) lower bound, large adverse shocks may activate amplification mechanisms and perverse spirals. Pioneering work by Rendahl (2016), Den Haan et al. (2017) and Ravn and Sterk (2016) stresses that, in response to a hike in unemployment, households tend to raise their saving rates substantially for precautionary purposes. When unemployment is high, it takes longer to find a job, which in turn magnifies income uncertainty for both workers who have lost their job and for workers who may fear losing theirs. As a result, aggregate demand falls, leading to more unemployment, more income uncertainty, and thus more saving. This negative spiral – unemployment, income uncertainty, low demand – has arguably affected all industrialised countries during the Great Recession, whereas monetary authorities could not reduce policy rates below their effective lower bound, and the scope for fiscal policy was constrained by debt accumulation.

In the euro area, things were much worse. The negative spiral from labour income uncertainty interacted with another powerful negative spiral rooted in the strict interconnection of sovereign, banking and macroeconomic risk at the national level. This problem was documented and stressed early on by Corsetti et al. (2013, 2014) as well as by the Euronomics group – the latter with a focus on the 'diabolic loop' linking sovereign risk to credit crunches via the large exposure of national banks to domestic debt (e.g. Bocola 2016, Sosa-Padilla 2017). In the euro area crisis countries, there is a strong correlation between sovereign risk spreads, banking spreads, and the

borrowing costs of households and non-financial firms (possibly well beyond what can be explained by inefficiencies due to a high concentration of national public debt in the balance sheet of national banks), as documented by Arellano et al. (2017) and Delatte et al. (2016), among others.

It is worth restating, if only briefly, the main mechanism at play. In the two-year period between 2010 and the summer of 2012, markets started to price sovereign risk on expectations that some member states could run into difficulties in sustaining the large fiscal costs of their banking crises and/or their large debt or in rolling over their maturing liabilities, or in anticipation of a possible break-up of the euro (Kriwoluzki et al. 2017). At the time, especially after the statement by Merkel and Sarkozy in Dauville, there was virtually no policy framework that could anchor these market expectations.

The moment markets developed arbitrary negative expectations of output growth in a country, they anticipated larger deficits and debt accumulation. A weaker fiscal outlook immediately translated into a hike of sovereign risk. With risk spilling over to all residents in the country (via a deterioration of bank assets and an anticipation of lower profits by firms), other things equal, interest rates rose on both government and private borrowing, driving down demand already in the short run. Unless policy measures, at the national or monetary union-wide level, could effectively counteract these effects, pessimistic expectations became self-fulfilling. Countries with high debt and limited fiscal space were extremely vulnerable to losses of market confidence.

Lost in translation at the launch of the euro: Monetary backstop of government debt

A discussion of the potential destabilising effects from these spirals is missing in the traditional optimal currency area (OCA) theory, as is a detailed analysis of what instruments a country would give up by delegating monetary policy to a common central bank.

The experience of the euro suggests that, for many a reason, an important function of central banking became ‘lost in translation’ when monetary policy was transferred from national monetary authorities to the ECB at the birth of the euro. In the words of the ECB president Mario Draghi:

> *"Public debt is in aggregate not higher in the euro area than in the US or Japan... [T]he central bank in those countries could act and has acted as a backstop for government funding. This is an important reason why markets spared their fiscal authorities the loss of confidence that con- strained many euro area governments' market access."* Mario Draghi, Jackson Hole Speech, 22 August 2014

It took some time (until September 2012), and quite a bit of institutional and political development, for the ECB to be able to put the Outright Monetary Transactions (OMT) programme in place, thereby reacquiring the fundamental function of providing monetary backstop that had been 'lost in translation.'

Work in ADEMU has explored the theoretical foundations of this key institutional development. Belief-driven runs on public debt have long been debated in the literature, in formal models at least since Calvo (1988). An analytical reconsideration of the mechanism is offered by Ayres et al. (2016), Bassetto and Galli (2017) and Corsetti and Dedola (2016). The role of the central bank in shielding a country from belief-driven runs is the main subject of the latter contribution, who considers the theoretical mechanism (and conditions) under which a programme of contingent debt purchases by the central bank can eliminate a government's (welfare) incentive to default.

An issue specific to monetary union is that individual member countries may not internalise the cost of union-wide inflation resulting from their default decision (in the extreme case in which balance sheet losses are so large that the ECB has to deviate from its target of making good on its liabilities) and/or may play strategically, counting on a monetary bailout ex post. To address moral hazard issues, OMTs are only activated if the country is in a European Stability Mechanism programme, and thus subject to conditionality and in receipt of official lending.

The problem of stabilising large recessionary shocks

The Outright Monetary Transactions programme launched by the ECB in 2012 has arguably eliminated, or at least reduced, the possibility of self-fulfilling creditor runs on a euro area member state. Yet, as discussed by Corsetti et al. (2017), the programme falls short of creating the conditions necessary for an accommodative fiscal policy stance,

especially in response to large negative shocks. The reason is that in order to qualify for the OMT, a country's fiscal policy must be pre-approved by policymakers from the other member states; this pre-approval is almost certain to require that the country's fiscal policy be non-accommodative. In practice, national fiscal policies appear to have remained effectively non-accommodative after the start of the OMT programme, and thus close to the policies that presumably would have been required to obtain approval for activating government bond purchases by the ECB under the programme.

An important step forward in completing monetary union consists of addressing fiscal pro-cyclicality. The first lesson from the crisis is that a large recessionary shock cannot be dealt with by relying exclusively on monetary policy, but rather accommodative monetary and fiscal policy together are required to satisfactorily stabilise the economy. A second key lessons from the crisis, specific to the euro area, is that the appropriate fiscal stance cannot be achieved without addressing polarisation, as this translates into either contractionary, or at best mildly expansionary, budget policies across the union.

How can a monetary union among independent fiscal states achieve an accommodative aggregate fiscal stance in response to large recessionary shocks? There is no single institutional solution. Possible strategies are discussed in the ECB Working paper listed under Corsetti et al. (2016) and Tabellini (2016).[1] An answer is also provided by the overarching proposal of a European Stability Fund for the EMU, discussed by Marimon in Chapter 2 of this eBook.

Whatever the approach, it is doubtful that the euro area can afford to ignore the need to strengthen its stabilisation policy framework against the tail risk of large recessions.

1 Corsetti et al. (2016) build on the following elements: a non-defaultable Eurobond that co-exists with defaultable national public debt; fiscal criteria for the member states that allow for fiscal accommodation when required by economic conditions, while being consistent with fiscal discipline for each member state; the ability for each country to restructure national public debt, as a last resort, in an orderly way without prejudice to full participation in the European Union or the euro; and fiscal support for the Eurosystem at the level of the euro area so that balance sheet considerations do not interfere with the ECB's policies.

Debt sustainability and debt reduction: The role of official lending

Debt overhang and country risk polarisation loom over the future of the EMU, motivating calls for 'risk reduction' and 'risk sharing'. A fundamental challenge to completing monetary union consists of understanding how to optimally trade off these objectives – that is, have countries pursue fast deleveraging while reducing exposure to financial and macroeconomic instability (e.g. Tabellini 2017). This trade-off is complex and requires a careful reconsideration of both theoretical results and empirical evidence.

In this respect, ADEMU has engaged in a thorough analysis of recent experiences of euro area and international institutions providing loans to crisis countries, through the lens of a quantitative model (Corsetti et al. 2017). Official loans affect governments' incentives to issue, repay, or default on debt, hence they impact how much debt a country can sustain, just like tax capacity. In other words, official lending regimes can raise the amount of debt that is sustainable at any point in time vis-à-vis both fundamental and rollover risk. Euro area lending institutions can, in principle, support countries in their efforts to reduce outstanding liabilities and address debt overhang, by basically shielding these countries (and the union) from the costs inherent in a default. A quantitative exercise can shed light on the most efficient ways to achieve this goal, and highlight policy trade-offs to be taken into considerations.

By comparing the ESM and the IMF programmes in the euro area, it is apparent that the ESM lends more, at much longer maturities and at much lower rates (Gabriele et al. 2017). Focusing on Portugal as a case study, Corsetti et al. (2017) develop a quantitative model contrasting the effects of long-term and short-term official loans, offered at different below-market rates, on a government's optimal decision to default in economies subject to both fundamental (output) and rollover risk.

Results from the exercise show that official loans can substantially raise debt sustainability. In the counterfactuals, Portugal can sustain up to between 80% and 180% of GDP depending on parameter specifications. Lengthening maturities has a stronger impact than reducing official lending rates.

However, the analysis also shows that, by making a higher stock of debt 'safe', official lending affects the average debt level that the government optimally maintains in the long run. A higher average debt ends up making the country more vulnerable to adverse dynamic developments in (exogenous) fundamentals. In other words, official lending causes fundamental default to become more likely. It is worth stressing that the trade-off described above exists independently of the effect that lending may have on a government's incentives to exert 'effort' or implement 'costly reforms' to enhance sustainability (these are not modelled in the exercise).

These results suggest that, while the ESM and IMF have undoubtedly contributed to containing potentially disruptive effects from the country risk crisis, their activities need to be framed in a more general and consistent strategy of risk reduction and risk sharing.

Looking at recent policy proposals, it is not uncommon to treat the euro area›s debt problem as two separate problems: first, how to restructure the large stock of legacy debt; second, how to create new institutions that will allow improved international risk sharing in future. This approach raises deep theoretical issues. Time-inconsistency is central to both problems: Brendon (2018), a significant debt write-down may be desirable now, but would violate past promises. A credible risk-sharing institutional design must be robust to future reassessment. The key question challenging economic theory is to how to consider both components simultaneously – that is, how to find a normative approach to international risk sharing that will prescribe an appropriate level of outstanding debt and its future evolution, given a country›s recent economic and fiscal performance. ADEMU provides leading work in this direction, with theoretical contributions (e.g. Brendon and Ellison 2017, Kehoe and Pastorino 2016 and Balke and Ravn 2016), but especially with the proposal for a European Stability Fund detailed by Ábrahám et al. (2018).

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2 A European Stability Fund for the EMU

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There are two related issues currently on the EMU agenda: the need to strengthen the European Stability Mechanism "as a robust crisis management mechanism" (European Commission 2017a), and the need to enhance the EU's capacity to provide risk sharing and fiscal stabilisation (Junker et al. 2015). Building on our ADEMU work "On the optimal design of a Financial Stability Fund" (Ábrahám et al. 2018), my co-authors and I show that the most efficient design would be to merge both functions into a *European Stability Fund (ESF)*, which would effectively transform current risky debt liabilities into safe *fund contracts*, taking the form of long-term state contingent bonds subject to endogenous constraints, to avoid undesired redistribution or implicit bailouts and moral hazard problems. With this design as a *constrained efficient mechanis*m, the ESF should also confront two additional pending issues: the 'debt overhang' problem, and the development of EU safe assets. Furthermore, the ESF can be implemented with minimal changes to the current structure and legal status of the ESM. In this chapter, I briefly summarise these findings.

One recognised problem with the EMU design is how country- or region-specific shocks can be smoothed, given that there is a common currency and there are limitations on fiscal national policies (the *Fiscal Compact*). Even under the present, more flexible interpretation of the Stability and Growth Pact, the ability to share risks is very limited compared with federal systems, where the same federal budget provides some risk

sharing to imperfectly correlated shocks across the federation.[1] Ferrari and Rogantini (2017) have shown, using counterfactual analysis, that being in the euro area has not helped to smooth consumption – in particular for countries on the periphery. The development of the European Banking Union can help to pool risks, but it is unlikely that it will have the smoothing effect that pro-cyclical local tax revenues have in federal tax systems. Similarly, it can be argued that the ESM can help to smooth consumption, but it is not designed as a risk-sharing mechanism, rather as a crisis-resolution mechanism. As we will see, there are gains to be had from integrating both functions.

A well-designed European Stability Fund must, on the one hand, take into account the constraints within which it will operate and, on the other hand, deliver the desired outcomes, which should constitute its mandate. In particular, three constraints need to be accounted for:

- First, ex post solidarity in a heterogeneous union is limited (i.e. risk-sharing transfers should not become persistent transfers beyond some mutually accepted limits).
- Second, as with any insurance scheme, there may be moral hazard problems, since idiosyncratic shocks (for example, welfare state commitments) can have an important endogenous component but, due to limited information or to sovereignty, the contract cannot be made 'conditional on the effort' that best policies require.
- Third, a 'union of sovereign heterogeneous countries' means that risk profiles and policies can be very different. In other words, what is needed is the design of a *constrained efficient risk-sharing mechanism for heterogeneous participants*.

In our quantitative models, efficiency is measured in welfare gains (more specifically, consumption equivalent gains), but it is important to list other tangible desired outcomes, and we mention five: i) risk sharing and consumption smoothing; ii) fiscal

1 Furcieri and Zdziencka (2015) estimate that in the EA15 over the period 1978–2010, 70% of countries' business cycle shocks were not smoothed, while the percentage is substantially lower in US states (25%) and in German Landers (20%). Using their methodology, the estimate for the EA19 for 1995–2015 is 83% (M. Lanati, Max Weber postdoctoral Fellow of the EUI).

stabilisation (i.e. fostering countercyclical fiscal policies); iii) a high capacity to absorb severe shocks; iv) minimisation of productive and social distortions (often associated with fiscal consolidations); v) building up trust across the union.

The proposed European Stability Fund sets a long-term contract with each participating country according to its risk profile, specifying state-contingent countercyclical transfers designed in such a way that neither the country nor the fund has any incentive to break the contract at any point in time (for example, by stopping making their payments), so the country exercises the right amount of effort to reduce country risks, and at any point in time the present value of the contract for the fund is non-negative (i.e. there is no mutualisation of losses for participating countries).

It is interesting to note how the ESF mechanism compares with (*de facto* defaultable) long-term uncontingent sovereign debt contracts currently in place, when the risk-averse 'borrowing' country is subject to similar shocks that the euro area 'stressed' countries have been exposed to in the last ten years. As our calibrations and simulations show, without debt crises the real euro crisis would not have been so severe – for example, there would have not been the severe contraction of consumption that we have observed – and therefore the welfare of the borrowing country would have been better, even if *ex post* permanent transfers from the risk-neutral fund had been set to zero.

ESF risk-sharing transfers take the form of long-term (state-contingent) bonds, and the fund has an important capacity to absorb existing (non-contingent) debts; therefore it can also be seen as an institution that transforms non-contingent risky debts into contingent debts – effectively non-defaultable debts, to the extent that ex post, neither the debtor nor the lender wants to breach or renegotiate the contract. In other words, without questioning that highly excessive debts may need to be restructured, a fund contract has a much greater capacity to absorb existing debts (i.e. to deal with the 'debt overhang' problem) than a new, possibly very long-term, non-contingent debt contract. Furthermore, by its very design, the debt contract is a safe asset in the balance sheet of the ESF, which should make ESF debt offerings highly rated in the international market

and, if (when) it gains sufficient capacity, the ESF should be able to act as a backstop in the EMU, say, to the European Banking Union, or act as a fund of an European Unemployment Insurance System (EUIS).[2]

Why is all this possible? A simple answer is: because we show it theoretically and with a well-calibrated model of the euro area 'stressed countries'! A deeper answer is: because well-designed long-term (ex post) contingent contracts are powerful 'carrots' for participating countries, in a similar way that access to the ECB and ESM has been a key 'carrot' in the resolution of the euro crisis. However, the similarities and differences between these existing institutions and the proposed ESF are important. As with the ECB, participation of an EU country in the ESF should not be compulsory, neither should participation in it be a 'stigma'; on the contrary, it should be the normal stabilisation, crisis-prevention mechanism that EU countries use on a regular basis. In contrast with the ECB, and more similar to the ESM, it is a fiscal mechanism, not a monetary one (and hence its name). However, there are two important differences with the current ESM. First, an ESF contract does not presuppose, or require, a crisis situation. Second, the conditionality of an ESF contract is ex post (i.e. performance based) and not ex ante (e.g. conditional on agreeing to an austerity/reform programme); the former builds up *trust*, the latter *stigma and resentment*.

It is always possible? The obvious answer is: no! As with any constrained efficient mechanism, there are trade-offs, which can be of two types. The first type is between *the constraints themselves and efficiency*: the more stringent they are, the lower the gains of a fund contract, and at a certain point the stringency wipes out the gains altogether. For example, participation constraints become more stringent if a borrowing country can achieve the above objectives on its own, or if the political risks – say, of exiting the union – are high; and similarly, if the acting lender, the ESF, is obliged to be more stringent or must satisfy additional (e.g. legal) constraints.

The second type of trade-off is between *simplicity and efficiency*, which can take two related forms: the 'conditionality' of the contract, and 'how comprehensive' the fund contract is with respect to other government liabilities. A less contingent contract is

2 See Chapter 3 in this eBook.

simpler in its design, but this entails a potential loss of efficiency and possibly an ex post, costly and complicated execution, as happens with uncontingent defaultable debt. But even if the latter cost is not present – say, with a 'rainy day' or 'large economic shock' insurance fund – there is a loss of efficiency in terms of implementing a countercyclical fiscal policy and smoothing consumption, since less contingency translates into more stringent participation constraints and less sensitive moral hazard constraints.

Similarly, it is simpler if the fund contract only covers a (small) fraction of a government's liabilities, without accounting for the rest; the 'rest' can be covered by standard debt contracts, for example. However, as happens with existing proposals for a European safe asset, these residual debt contracts may become more risky as these debts accumulate, threatening the same stability of the fund contract, unless the ESF can commit to a strict mandate of not rescuing countries in this situation. Unfortunately, such a strict mandate may not be possible, and a better – although more complex – design would be to properly limit the external debt capacity of a country with an ESF contract.

As can be seen, there are many risk assessment and contract engineering issues that need to be dealt with in designing ESF contracts. Our ADEMU work, building on current dynamic macro-contract quantitative theory, has developed the basic tools to make country risk assessments and to further develop ESF contracts. It will be the ESF's task to tailor them, in their specific technical and legal details, and implement them. EU law (a change of the ESM Treaty may suffice) and political accountability (also possibly similar to the ESM) can, and should, define the operational framework of the ESF. In any case, the ESF should be responsible for its contracts and, correspondingly, for its balance sheet. This will provide credibility to the ESF in the execution of its contracts, since it will be in its own interest to preserve the safety of its assets, namely, the ESF contracts.

A short comment on how our ESF proposal relates to two existing proposals to reform the ESM. With respect to the European Commission's proposal (European Commission 2017b),[3] our focus here is on the mission and design of the ESF and its contracts, not on

3 See Chapter 10 of this eBook for a more in-depth discussion of the Commission's proposal.

whether it should be integrated into the EU Treaties or whether the ESM Treaty should simply be adapted, although the latter should suffice. More importantly, our proposal envisions a broader role for the ESF: to be the central institution to implement what the Commission calls the "Stabilisation Function" of the EMU (European Commission 2017c). With respect to the *French and German economists'* proposal (Bénassy-Quéré *et al*. 2018), we provide an overall framework into which their proposals for "a European fiscal capacity for large economic shocks" and "rainy-day fund providing liquidity" are integrated, and can be assessed; in particular, we consider constrained efficient, not just ad hoc, policies and contracts. It also differs in how fund contracts and 'residual debt contracts' should complement each other.

In summary, we have provided a theoretical and quantitative basis for the design of a European Stability Fund as a 'constrained efficient mechanism' which should substantially enhance the capacity of the European Union to: i) provide risk sharing and fiscal stabilisation in normal times; ii) provide insurance against severe country, or regional, shocks (in other words, the ESF would be a 'robust crisis-management mechanism)'; iii) absorb existing risky sovereign debts and transform them into safe fund contracts (i.e. it would confront the 'debt overhang' problem); and iv) develop a safe EU fiscal institution (i.e. it would be able to issue the 'safest' EU asset in the international financial market).

The strength of the design relies on considering the ESF as a key institution of the EMU, which is a 'long-term partnership' of sovereign countries. The credibility of the design relies on the fact that it accounts for existing EU constraints: first, in the heterogeneity across member countries (their structure, policies and liabilities); and second, in the respect for 'sovereignty', which implies that it should always be in the interest of the participating countries – and of the ESF – to satisfy the contract; that is, to neither default on, nor renegotiate, it (although country risk profiles may, and should, be updated if needed). This, in turn, imposes ex ante and ex post limits on redistribution (there is no redistribution in our benchmark design). Furthermore, having independent national policies may result in moral hazard problems that cannot, indeed should not, be solved by imposing 'austerity plans' or financial fines. The flexibility of the design relies on the fact that it can be accommodated to different degrees of risk sharing, or levels of severity of the constraints (robustness), although this may be

at the cost of losing efficiency. Finally, the proposed ESF can be developed out of the existing European Stability Mechanism (for example, by modifying its Treaty), and steps towards this transformation should in fact be improvements with respect to its current capacity and practices (e.g. ESM contracts), which have already been proved to be very valuable in the resolution of the euro crisis.

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3 Agreeing to an unemployment insurance system for the euro area?

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In this chapter we offer novel answers to three related questions:

- What are the potential benefits of developing a European unemployment insurance system (EUIS)?
- Could all the European countries involved benefit from a common, simple change to their current unemployment insurance systems?
- Could unanimous agreement for this change be achieved without needing permanent transfers across countries?

To properly address these questions, we first develop a dynamic equilibrium model with job search frictions, which provides a new characterisation of how different euro area labour markets are and therefore calls into question whether such an agreement can ever be reached. Nevertheless, our answer to the final question is: yes, it can be done!

Should the EU provide unemployment insurance?

The recent financial and sovereign debt crises have affected European labour markets asymmetrically, both in terms of duration and the severity of unemployment. In particular, stressed countries (such as Greece, Portugal and Spain) have experienced high levels of unemployment, making it very difficult, if not impossible, to provide

1 This chapter is based on ADEMU Working Paper No. 2018/xxx (Ábrahám et al. 2018).

adequate insurance for the unemployed while, at the same time, satisfying low-deficit commitments (the Fiscal Compact). Even if the EU economy is now growing, this does not mean that the scars of the crisis have healed, that resentment has receded, or that the European unemployment problems are problems of the past, and the question often asked is whether the EU can, and should, provide unemployment insurance. This has raised interest in proposals for a Europe-wide, or perhaps a euro area-wide, unemployment insurance system, which date back to the Marjolin Report (European Commission 1975), where a "Community Unemployment Benefit Fund" was first proposed. The European Commission has been working on this issue, and a "German-Spanish proposal for a robust European Unemployment Insurance" (Dullien et al. 2018) by a group of Members of the European Parliament, will soon be discussed in the Parliament. Quantitative and theoretical studies have also been presented in recent years, assessing the potential costs and benefits of an EUIS (Moyen et al. 2016, Dolls et al. 2018).

As with any major social reform at the EU level, there is a polarised, and politicised, debate regarding the desirability of an EUIS. The proponents of such a new policy suggest that, in addition to improving solidarity and labour market integration, the system could provide insurance for country-specific shocks by pooling resources, thus allowing countries to go through crises without suffering the consequences of distortionary tax rises; the system could possibly also foster necessary labour reforms. Opponents say that UI policies should remain fully in the hands of the member states, and that such a system cannot ever be politically feasible (or desirable) as it would always imply permanent cross-subsidisation from countries with better labour market institutions (with low unemployment) to high-unemployment countries, which would therefore have even less incentive to reform their labour markets.

Weighing up the costs and benefits across Europe

We take a step back and study quantitatively how these potential benefits and costs weigh against each other. Following Krusell et al. (2011), we use a dynamic general equilibrium model with job search frictions to analyse workers' stocks and flows across labour market states (employment, unemployment and inactivity) in order to assess the impact of an EUIS under alternative unemployment insurance policies. Our analysis

provides a parsimonious way of comparing labour market institutions across Europe. Our first finding is not new but our simple representation is: there are large and systematic differences that can be summarised by how a few labour market frictions differ across labour markets. Almost surprisingly, in spite of the differences, our model suggests that welfare-maximising unemployment benefit policies are very similar among the countries that have been analysed: in all countries, a long duration of unemployment benefits and a relatively low replacement rate of around 15% is welfare-improving, compared to the status quo. The resulting tax differences across countries reflect their structural labour market differences, in terms of job creation and destruction. These tax differences also provide clear incentives for labour market reforms.

As part of the ADEMU research project, we provide the first assessment of an EUIS that takes into account individual agents' optimal reactions to changes in UI policies in terms of labour supply, job search effort, labour market participation and private savings decisions, across different euro area countries. Moreover, we describe the necessary changes in taxes – in the long run and in the short run in response to shocks – that would finance different specifications of UI systems. Using a dynamic general equilibrium model, we show how taxes and unemployment benefit policies affect agents' private decisions and how these private decisions shape aggregate responses to policies. We carry out this assessment on the basis of a multi-country model of EU labour markets that takes into account institutional differences across countries, as well as current country-specific national unemployment insurance policies (labour income tax, benefit replacement rate and duration of benefit receipt). The model successfully replicates the observed long-term heterogeneity in labour market outcomes (employment and unemployment rates, duration of unemployment spells, flows across employment states, and so on). Our analysis highlights the fact that taking into account inactivity and the distortionary effect of the taxes financing the unemployment insurance system is crucial to understanding both the aggregate and distributional implications of unemployment insurance policies. The structural model parameters provide a unique diagnosis of European labour market institutions and UI policies, and allow for a meaningful comparison across European countries. Figure 1 shows the heterogeneity in exogenous job arrival rates for the unemployed who actively search for a job versus inactive agents. Figure 2 depicts the heterogeneity in unemployment benefit policies across Europe (replacement rate versus maximum duration of benefits).

Figure 1 Labour market institutions (model)

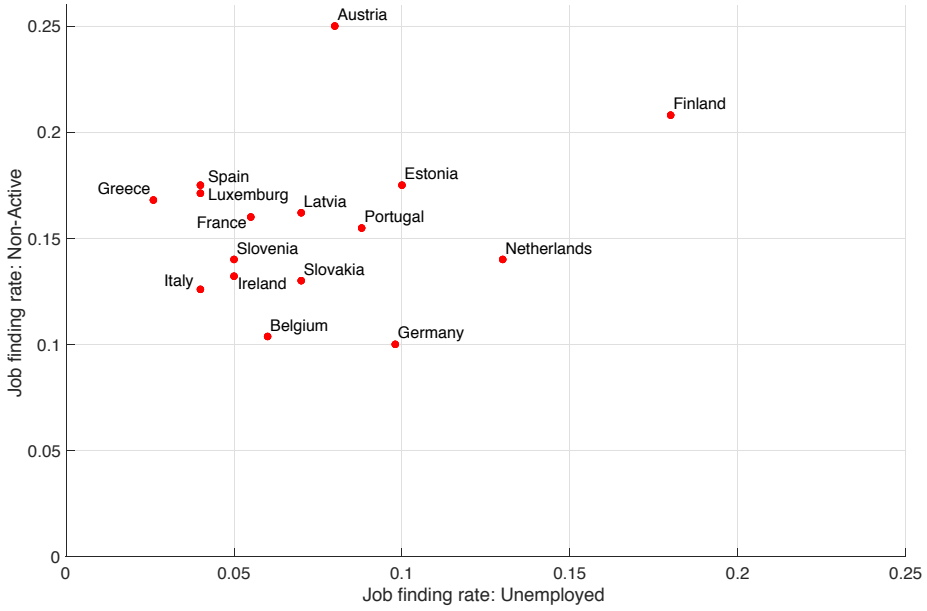
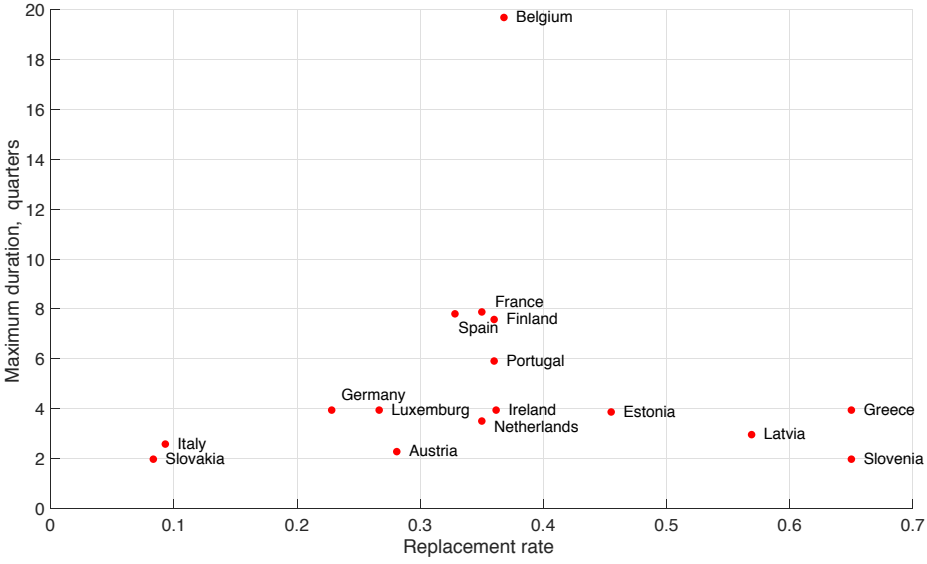


Figure 2 Unemployment benefit policy (data)



On the basis of this calibration, we perform a set of policy experiments. In the political debate, proponents of a common European unemployment insurance system often emphasise the risk-sharing benefits of such a system. Business cycles are not perfectly synchronised across Europe and recessionary countries often have difficulties raising the funds for increased expenditures on unemployment benefits without violating the regulatory (Fiscal Compact) rules of the EU. Our first experiment therefore targets a quantitative evaluation of the potential pure risk-sharing benefits of an EUIS. To this end, we compute the labour market and welfare consequences of a deep recession in two alternative scenarios: (i) the government is in financial autarky and needs to raise taxes on the employed in order to maintain a balanced UB budget; and (ii) the country is insured against increased unemployment and can go through the recession without raising taxes. Otherwise, we assume that the unemployment insurance system remains the same in all countries in both cases.

We find that the risk-sharing benefits resulting from the welfare differences of the second scenario with respect to the first one are small (less than 0.1% consumption equivalent variation for each country), and marginally higher for the employed, whose taxes are smoother, than for the unemployed, whose benefits do not change. This experiment is purposefully constructed to provide an upper bound for the true benefits. The experiment implies that although insurance benefits exist, their small size may not justify the introduction of an EUIS, unless other factors increase its value.

In light of this result, one may doubt the desirability of a European unemployment insurance system; even more so as the observed heterogeneity in labour market institutions (see Figure 1) suggests that the optimal benefit systems could differ substantially across European countries, making it difficult for governments to reach a common ground. To evaluate this claim, we compute the optimal unilateral reform of the unemployment benefit system (financed at the national level) separately for each country. We find that the optimal mix of replacement rate, and duration of unemployment benefits, is surprisingly similar across the countries studied.

All countries would benefit from an unlimited duration of benefit receipt, and almost all countries a replacement rate of between 10% and 20% (the exceptions are France and Luxembourg, with optimal replacement rates of 30% and 40%, respectively). In addition, for every single country, a reform of this type (unlimited duration and replacement

rate at anything between 10% and 20%) would lead to welfare gains compared to the status quo. These policies provide better insurance against unemployment shocks as they eliminate the risk of losing eligibility before finding a job. At the same time, the relatively low replacement rate will keep the tax burden – and hence labour market distortions – low. The main difference in the optimal policies is thus the tax rate needed to finance the very similar benefit systems. Taken together, these results suggest that European governments may be able to reach a consensus on introducing a minimal harmonised European benefit system (potentially with the possibility for national governments to complement it with additional benefits).

Table 1 shows the average welfare gains[2] (in percent of consumption equivalent variation) of introducing such a harmonised system (unlimited duration and a replacement rate of 15%). The last column presents the payroll tax rates that national governments need to charge wage earners in order to avoid permanent cross-country transfers. These tax differences across countries mostly reflect their structural labour market differences which are kept constant, in terms of job creation and destruction, and they may serve as an incentive device for labour market reforms. The elimination of permanent transfers through varying contribution payments is a necessity in order to reach a consensus across European countries. As Figure 3 shows, aggregate employment remains stable (the same is true for all the large countries, but not for all small ones) but there is a small transfer from inactivity to unemployment. Table 2 shows the welfare gains if the same harmonised benefit system were to be financed jointly with common tax rates at the European level. Austria, France and Luxembourg would be likely to oppose the introduction of such a system. Interestingly, some of the net payers (Germany, Belgium, Finland and Ireland) would still prefer the reform, indicating that the current tax-benefit system in some countries is far from optimal. Hence, they would benefit from longer eligibility and lower replacement rates (lower taxes), although they would pay permanent transfers into the system.

2 The present value welfare gains from the introduction of the reform to the convergence of the economy, where the union of the ten countries is a closed economy, i.e. interest rates are endogenous.

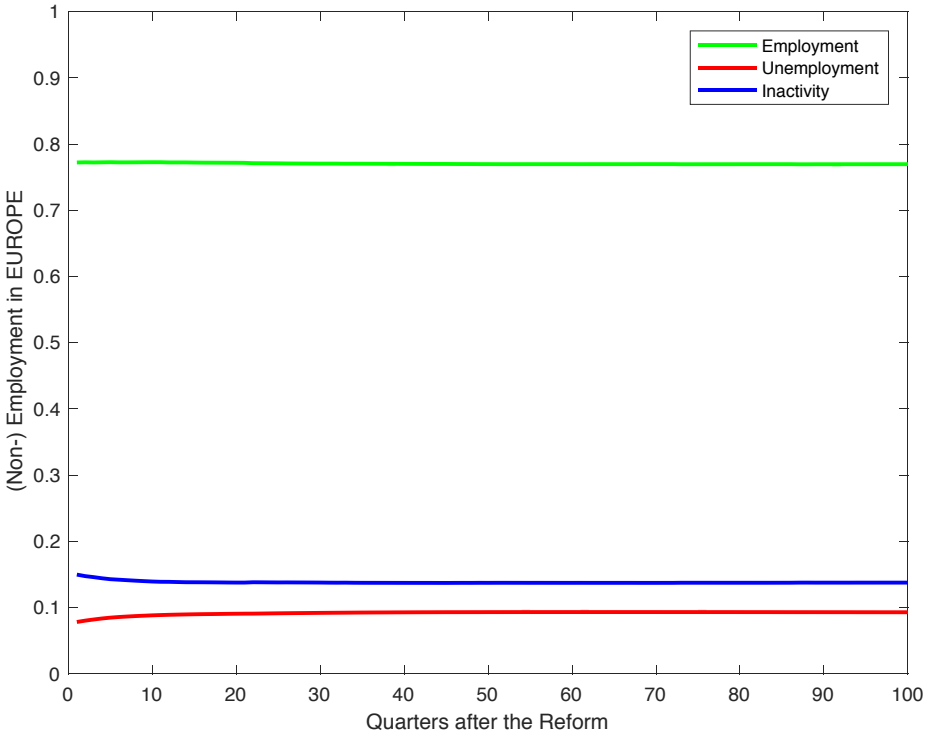
Table 1 Welfare gains (% of consumption equivalent variation) and tax rates (%)

	Employed	Unemployed	Inactive	Total	Tax Rate
Austria	0.21	0.51	0.24	0.23	0.73
Belgium	1.05	-0.24	0.81	0.92	0.45
Germany	0.34	0.44	0.28	0.38	1.27
Spain	0.65	0.65	0.58	0.62	2.53
Finland	2.09	1.83	1.90	2.03	0.22
France	0.11	0.18	0.09	0.11	1.23
Ireland	0.77	1.31	0.73	0.79	1.34
Italy	0.48	1.58	0.51	0.60	1.90
Luxembourg	0.30	0.51	0.33	0.32	0.55
Netherlands	0.06	0.13	0.03	0.08	1.57

Table 2 Welfare gains (% of consumption equivalent variation), tax rate (%) and transfers (in % of GDP)

	Employed	Unemployed	Inactive	Total	Tax rate	Transfer
Austria	-0.31	-0.05	-0.28	-0.29	1.47	-0.51
Belgium	0.36	-1.01	0.18	0.25	1.47	-0.71
Germany	0.16	0.79	0.14	0.20	1.47	-0.14
Spain	1.51	1.42	1.31	1.45	1.47	0.74
Finland	1.11	0.63	0.92	1.04	1.47	-0.87
France	-0.06	-0.02	-0.08	-0.06	1.47	-0.16
Ireland	0.66	1.07	0.63	0.68	1.47	-0.09
Italy	0.75	2.13	0.76	0.87	1.47	0.29
Luxembourg	-0.43	-0.20	-0.34	-0.40	1.47	-0.64
Netherlands	0.14	0.55	0.12	0.17	1.47	0.07

Figure 3 Employment, unemployment and inactivity after the EUIS reform



Conclusions

Should we introduce a common European unemployment insurance system? Our results show that the risk-sharing benefits seem to be very low and by themselves would be unlikely to provide a strong enough rationale for the introduction of such a system, although we do not account for additional benefits that a common UI system can provide in terms of labour market integration and mobility. At the same time, we also show that despite the large differences across European labour markets, the optimal unemployment insurance policies are remarkably similar, and the gains to be made by changing the current UI systems in a common direction are substantial. If the permanent differences in labour market institutions (and consequently in unemployment rates) are neutralised by country-specific tax rates, a common system could improve welfare in

all countries. This implies that the cross-subsidisation problem can be dealt with by an 'experience rating' system, where countries' contribution to the common pool depends on their long-run unemployment rate.

An EUIS could be implemented through the existing national UI systems with the support of an EUIS Fund absorbing deficits and surpluses due to unemployment deviations from the 'national unemployment steady state'. The contract between the fund and a national UI system can be designed to be revenue neutral (see Chapter 2).

In sum, according to our analysis the main advantage of an EUIS is twofold.

- First, it allows member countries to move towards a more efficient unemployment insurance system, while there may be non-properly accounted general equilibrium effects and political constraints to moving in this direction individually.
- Second, the differential tax rates associated with the EUIS would provide a transparent way of assessing the benefits of labour market reforms for the member countries.[3]

Furthermore, member countries can always improve upon the common system if they wish – for example, by increasing their replacement rates – and an EUIS can also enhance labour cohesion and mobility across EU participating countries, and social identity with the EU, which is exactly in the spirit of the original proposal of the Marjolin Report of 1975!

3 This design avoids moral hazard problems present in other formulations; see Jung et al. (2017) for a model where there are ample possibilities for moral hazard distortions.

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4 Macroeconomic stabilisation in heterogeneous societies

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ADEMU has been heavily engaged in developing new models for macroeconomic stabilisation which combine frictions in goods and labour markets, typically stressed in the monetary economics literature, with incomplete asset markets, stressed in the literature that has considered distributional issues. When these features are combined, new implications arise for macroeconomic stabilisation. This chapter reviews some of these issues and argues that stabilisation policy is particularly important in the face of idiosyncratic risk and incomplete markets because of the amplification that can arise through countercyclical earnings risk, and because of a new source of interaction between monetary and fiscal policies.

A new generation of macroeconomic models

A new generation of models have made their way into macroeconomics: models that combine frictions in goods and labour markets with incomplete asset markets and idiosyncratic risk, Heterogeneous Agents New Keynesian (HANK) and HANK + search and matching (HANK&SAM) models. This new generation of macro models not only allow researchers to bridge the gap between microeconomic evidence on consumption and savings choices, but also offer new insights into macroeconomic stabilisation policy. Furthermore, the new models potentially resolve a host of issues that have haunted the macro model's standard representative agent-based macro in the aftermath of the financial crisis.

Representative agent New Keynesian models, the hallmark of much of macroeconomics until recently, are attractive for computational reasons because households and entrepreneurs are subject to only aggregate risk. In such settings, stabilisation policy needs to address the imperfections in goods and labour markets which distort the economy and prevent prices and wages from adjusting towards their frictionless hypotheticals. In much of this literature, monetary policy is a powerful tool for stabilisation purposes, while fiscal policy often can be constrained to targeting inefficiencies due to market power (and possibly to correcting for externalities) subject to monetary-fiscal coordination issues. The latter would typically induce a need to delegate a 'passive' role for one instrument and an 'active' role for another, such as the typical macroeconomic framework that involves monetary policy aiming at price stability and fiscal policy ensuring government solvency. These models leave little role for distributional issues (which perceivably may matter much for stabilisation), do not provide a good account of income, consumption and savings patterns observed in household data, and have problems explaining important features of the recent crisis such as outcomes with persistently low levels of activity, short-term nominal interest rates at or close to their lower bound but positive inflation. Moreover, in these models there is little interaction between demand and supply because of (the indirectly or directly assumed possibilities for) insurance opportunities, which shields agents from risks apart from those directly related to aggregate shocks.

Recently, a literature has developed which has combined the frictions in goods and labour markets stressed in the representative agent models with financial market incompleteness and idiosyncratic risk. This includes a large number of contributions from ADEMU such as Bayer et al. (2017), den Haan et al. (2018), Luetticke (2017), and Ravn and Sterk (2017, 2018). It also formed the basis of an ADEMU conference which was held at UCL in May 2017. The essential new ingredient of HANK models is that households operate in environments where they are subject not only to aggregate shocks but also to idiosyncratic income, and where they lack insurance against such shocks. A simplifying assumption made in some of this new literature is that the idiosyncratic risk faced by households is 'exogeneous'. Nonetheless, because of imperfect insurance, idiosyncratic risk matters for whether households are liquidity constrained or not and this, in turn, matters for macroeconomic outcomes and policy. In such environments, there will typically be rich distributional dynamics that reflect the extent to which

agents – through luck or behaviour – have been subject to shocks over time. By itself, such inequality may motivate new policy concerns, as monetary and fiscal policies in general will have distributional consequences. However, in terms of the aggregate consequences, the main difference between HANK models and representative agent models is the way in which policies matter for aggregate outcomes.

In standard New Keynesian models, monetary policy operates through manipulating expectations and through impacting directly on real interest rates, which in turn affect intertemporal allocations through standard consumption-smoothing channels. In HANK-type models, instead, monetary policy also influences consumption streams for those who are (or anticipate becoming) liquidity constrained through the effects on the intertemporal income stream. This literature has stressed that this channel is extra important in settings with illiquid assets (Luetticke 2017). Indeed, it is often the case that this indirect channel becomes dominant when carefully calibrating these models. Moreover, because Ricardian equivalence fails in these models, the interaction between monetary and fiscal policy becomes very important. In particular, in HANK models fiscal policies that impact directly on household income, such as taxes or transfers, will tend to reinforce the (indirect) impact of monetary policy, while policies that adjust debt will tend to moderate the distributional channels.

The implications from endogeneous risk

The new literature has even richer implications when earnings risk is endogenous. One channel of such risk is unemployment; another is wage risk. Consider a setting where matching frictions prevent continuous clearing of the labour market and give rise to frictional unemployment. Assume also, realistically, that households cannot perfectly insure against unemployment. Because of the matching frictions, jobs are easier to find in booms than in recessions, which induces countercyclical earnings risk. On the other hand, workers may have more to lose in booms if wages are procyclical. This source introduces a procyclical endogenous risk channel. Which of these channels dominates will have consequences for a large number of issues – countercyclical risk tends to amplify shocks to the economy because demand contracts in bad times when workers perceive a high risk of unemployment, and vice versa in booms. When risk is procyclical instead, demand boosts the economy in bad times as workers perceive that

the income loss from losing their job may be smaller than in booms. Ravn and Sterk (2018) argue that empirically, real wages tend not to fluctuate much over the business cycle while the risk associated with job loss is strongly countercyclical. Hence, the endogenous risk channel tends to be countercyclical.

Such endogenous countercyclical earnings risk has a host of implications deriving from a new interaction between the demand and supply sides of the economy. When households lack insurance against unemployment, they have a precautionary savings motive which contracts demand when labour market conditions weaken. This, in turn, induces a contraction in goods demand – over and above the mere income losses of those who lose their jobs – because employed households worry about the potential consequences of job losses. Firms can react to such a contraction in demand in a variety of ways, but due to labour and goods market frictions, they will reduce their labour demand. Lower labour demand, in turn, implies even higher job loss risk on the part of employed households, which motivates even stronger precautionary savings demand. Hence, due to the countercyclical endogenous earnings risk, HANK&SAM models introduce an amplification mechanism through a supply-side and demand-side interaction. Ravn and Sterk (2017) show that this mechanism can help understand why the increase in job losses at the beginning of the financial crisis set off an extended period of poor labour market conditions and rising long-term unemployment. Ravn and Sterk (2017) also argue that a stronger policy response to the crisis could have partially neutralised the demand channel and stabilised the economy.

In environments where the endogenous earnings risk is sufficiently important, the economy may be sensitive to bad long equilibria that involve low activity, high unemployment, and low but positive inflation. Ravn and Sterk (2018) discuss that such long-run equilibria, or 'unemployment traps', resemble secular stagnation outcomes. In the HANK&SAM setting, these outcomes derive from households worrying about adverse labour market outcomes, which can be self-fulfilling when precautionary savings motives are sufficient strong. Such bad outcomes can be avoided most directly by providing sufficient insurance against adverse income shocks for households (i.e. through unemployment benefits). Hence, stabilisation policy is important not only for short- to medium-term outcomes, but may also help insulate the economy from potentially long-lasting slumps.

The presence of countercyclical endogenous earnings risk also implies that monetary policy will have to be designed to generate more stabilisation than is dictated by the well-known 'Taylor principle'. This principle essentially insures against self-fulfilling equilibria in the vicinity of equilibrium by making real interest rates and inflation move together in response to fluctuations in the economy. In incomplete market settings, such a policy may not be sufficient to root out other equilibria because of the interaction between the demand side and the supply side of the economy and precautionary savings. In particular, when nominal rigidities and precautionary savings motives are both strong, monetary policy needs to be extra aggressive to stabilise the economy.

Interaction between the demand and supply sides

The interaction between the demand side and the supply side that generates countercyclical earnings risk has other interesting implications. One issue concerns the inflationary impact of supply side shocks such as technology shocks. In traditional New Keynesian models, technology shocks impact on marginal costs, and stabilisation policy involves stabilising these. In such settings, higher productivity means lower inflation. In HANK&SAM models with countercyclical endogenous risk, higher productivity also spurs higher labour demand, which in turn lowers job risk and thus stimulates goods demand. This latter channel, in turn, implies that higher productivity may induce higher inflation. For the same reason, liquidity traps (periods where nominal interest rates are at or close to their lower bound) may occur at positive inflation rates if monetary policy responds not only to inflation but also to outcomes such as unemployment.

This latter implication is interesting empirically. In the aftermath of the financial crisis, as the economy slumped, short-term nominal interest rates went close to their lower bound and remained there for an extended period. Yet inflation, while low, remained positive in the euro area as well as in other major economies such as the UK and the US. This feature is hard to explain in standard representative agent models used for policymaking since the liquidity trap in such models is accompanied by deflation. Specifically, in these models, the slump in activity in a liquidity trap occurs as a process of low demand driving down inflation and nominal interest rates until eventually nominal rates cannot fall any lower, at which point the economy becomes deflationary and activity slumps. In the new generation of models, the slump in activity also induces

an increase in earnings risk due to rising unemployment, which depresses demand although inflation may be positive. It is this precautionary savings motive that can lead the economy into a liquidity trap with low, but positive, inflation.

Avoiding such outcomes again hinges both on monetary and fiscal policies giving stabilisation policy a key role in the economy. Interestingly, in such settings, supply-side reforms may help the economy recover as their impact on labour demand may induce increased goods demand, thus helping to stimulate the economy. Interestingly, in the standard representative agent model, supply-side reforms may be counterproductive in liquidity traps. The reason is that supply-side reforms will tend to drive down inflation because of the impact on the marginal costs of production. Even lower inflation, in turn, increases real interest rates, reducing demand. In contrast, in the face of incomplete markets, supply-side reform, by reducing unemployment, can stimulate inflation because this alleviates the precautionary savings motive which can drive up goods demand.

Conclusion

In summary, the new generation of models have many implications for the design of monetary and fiscal policies that need to be considered by policymakers. Providing insurance against adverse shocks – for example, through unemployment insurance and other channels – is important for stabilising the demand side of the economy, monetary policy becomes extra important for neutralising the amplification mechanism, monetary-fiscal interaction is key not only in terms of providing anchors but also in terms of implications for demand deriving indirectly through household income, and welfare issues related to uncertainty and inequality matters for the design of optimal policies.

No doubt the new literature will develop rapidly over the coming years, but it already appears to be on track to replace the representative agent New Keynesian model.

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5 Recessions following expansions: The instability of market economies

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The US financial crisis and the euro crisis were both preceded by expansions and followed by recessions. These episodes are recent manifestations of a more general feature: market economies repeatedly go through recessions and expansions. The dominant paradigm used by central banks and governments to understand such fluctuations is based on the belief that the economy is fundamentally stable and that business cycles predominantly reflect the effects of outside forces that, in many cases, can and should be countered by appropriate stabilisation policies.

Conventional wisdom interprets the last 30 years of macroeconomic fluctuations in developed economies in the following way. In the middle of the 1980s, developed economies entered a Great Moderation in which macroeconomic volatility decreased. This stability has been interpreted as the consequence of both smaller shocks and better stabilisation policies, particularly better monetary policies. This view of an 'end to business cycle history' was dramatically contradicted by the 2007 Great Recession, which put the role of the financial sector front and centre as a source of shocks and as a mechanism for amplification and propagation.

The theoretical foundations of this view – incarnated by Smets and Wouter (2007) for the pre-Great Recession period, and by Christiano et al. (2015) for the Great Recession period – are as follows. The economy is fundamentally stable, with market forces acting to push it towards a smooth growth path. That smooth growth path is determined by technological, demographic, and social change (the emergence of information

technology, the increase of life expectancy, the increase in female labour market participation, and so on). Business cycles consist of fluctuations around that smooth trend that are caused exclusively by the arrival of random shocks; if there were no shocks, the endogenous stabilising forces would cause the economy to converge to its trend. As Prescott (1999) wrote, "*[t]he Marxian view is that capitalistic economies are inherently unstable and that excessive accumulation of capital will lead to increasingly severe economic crises. Growth theory, which has proved to be empirically successful, says this is not true. The capitalistic economy is stable, and absent some change in technology or the rules of the economic game, the economy converges to a constant growth path with the standard of living doubling every 40 years*."

Such a view is compatible with the theoretical results in the applied general equilibrium literature, according to which the growth path or steady state is stable, and fluctuations around it are therefore only caused by shocks. This in turn justifies the idea that one can think of the economy as being at most times in a neighbourhood of its steady state. It also justifies the restriction to linear approximations around the steady state, which is computationally convenient, in particular when one needs to estimate dynamic stochastic general equilibrium (DSGE) models. As Blanchard (2014) wrote, "*[w]e in the field did think of the economy as roughly linear, constantly subject to different shocks, constantly fluctuating, but naturally returning to its steady state over time*".

Challenging the conventional wisdom

In our recent research, we challenge this view that fluctuations are the consequences of shocks pushing the economy away from a stable steady state. We do so by providing new evidence, proposing a new conceptual framework, and developing new solution techniques (Beaudry et al. 2016a, 2016b, Galizia 2018). Although we study a set of developed economies, we will focus here on our results for the US economy.

First, we argue that the business cycle is well captured by the fluctuations in the intensity of factor usage. We therefore look at variables such as hours worked per capita, employment and unemployment rates, capacity utilisation. Because these variables do not tend to grow over long periods of time, the problem of how to decompose a variable

into its trend and cycle components is much less of a statistical issue, in contrast, for example, to output per capita.

When looking at such variables, there is much less evidence of a Great Moderation, and business cycles appear to be somewhat regular, typically lasting around 10 years. More formally, we show evidence of a significant peak in the spectral density of such cyclical variables. This cycle has a slightly longer period than the two-to-eight years definition generally adopted in the literature, and is likely to be discarded by usual filtering methods.

The existence of a peak in spectral density contrasts with the common wisdom since Granger (1969) that there are no peaks in the spectral density of macroeconomic variables at business cycle frequencies, and that the business cycle is mainly defined by co-movements. The finding of recurrent cycles with a 10-year period has two possible explanations: the exogenous shocks themselves display such recurrence (which would require them to have a fairly rich dynamic structure), or it is embedded in the economy's internal mechanisms. It is hard to observe proxies for exogenous shocks. When one does – for example, with corrected total factor productivity – one does not find such rich dynamics. We therefore follow the second route and search for endogenous dynamics that are capable of making the economy intrinsically cyclical.

An intrinsically cyclical economy is indeed an economy in which expansion and recessions are linked, in the sense that the expansion is sowing the seeds of the next recession (and vice versa). This property can be found in an old tradition of non-micro-founded models (Kalecki 1937, Kaldor 1940, Hicks 1950, Goodwin 1951), but not in the typical modern DSGE models.

Our second contribution is to present a general class of model that can generate endogenous cyclicality. Three features are essential: complementarities between agents, accumulation, and sluggishness. Because of complementarities, each economic agent tends to choose a higher level of action (consumption, investment in durable goods and capital or hiring depending on the model) when the others are also doing so, thereby creating powerful amplification forces. Because of accumulation, deviations from the steady state do not last forever. At some point, the economy hits the decreasing marginal returns (e.g. for labour or capital) or decreasing marginal utility (e.g. for durables),

and as a result it does not move away from the steady state indefinitely. Because of sluggishness, the swings from above to below the steady state and back are not too frequent, so that fluctuations at the frequencies highlighted in the data can occur.

In this abstract class of model, we propose a specific explanation that shares many features with the mechanisms highlighted by Morten Ravn in Chapter 4 of this eBook. The complementarity between agents is created by the incompleteness of financial markets. In an economy where consumers face a risk of unemployment that is largely uninsurable, everyone is encouraged to spend more when others are spending more, since larger aggregate expenditure reduces unemployment, which in turn lowers an individual agent's own risk of losing her job. As a result, each individual can reduce her level of precautionary savings and spend more. In equilibrium, then, an agent spends more when others spend more. This mechanism is able to produce cyclical forces when coupled with the accumulation of durable goods and residential investment. The endogenous cyclical forces are generated by individually rational decisions that generate a socially costly instability. There is therefore room for stabilisation policy.

The sequence of expansions and recessions is explained as follows: at the end of the recession, the stock of real estate and durable goods is depreciated, so that some agents decide to spend (to replace an old car, for example, or to eventually decide to purchase a larger or better located house) even though the risk of unemployment is still high. In doing so, they increase expenditures, which tends to increase production and employment, and thus to reduce unemployment risk, pushing other agents to reduce their precautionary savings and spend more as well. This expansion does not stop when the socially optimal level of housing and durable goods is reached, because each individual has a desire to spend, even though each of them rationally understands that the inevitable future recession is likely to be larger when the stock of houses and durable goods is large. When households decide to slow down their accumulation by reducing their spending, they create an increase in unemployment, and thus an increase in precautionary savings which reduces spending even more, thereby amplifying the initial decrease in spending. The economy is then in a state of deficient demand, and a vicious spiral is triggered. The economy goes into recession, which lasts until stocks of houses and durable goods are sufficiently reduced for agents to start spending more.

As a result of the above mechanisms, it is possible in principle for multiple steady states and/or sunspot equilibria to emerge. In our analysis, we focus on cases in which complementarities are 'weak', meaning that there is a unique steady state and that trajectories are determinate. Nevertheless, weak complementarities can generate strong centrifugal forces close to the steady state, causing it to lose local stability. From bifurcation theory, we then know that a limit cycle will exist in the global dynamics (i.e. in the non-linearised version of the model). The economy then perpetually cycles without shocks. The steady state is unstable, but the model is not globally explosive. Absent any shocks, the cycle would be fully predictable. It is reasonable to believe, however, that the economy is also continually affected by events such as changes in perceptions, in expectations, changes in technology and so on, so that the length and the amplitude of the cycle will vary in a unpredictable way.

This 'stochastic limit cycle' environment is not simply a theoretical curiosity, and we show that, when estimated, the model parameters are in the zone in which these limit cycles appear. Shocks are still needed, however, not to *create* fluctuations but rather to make them less predictable. Our third contribution is to develop a way to solve for such saddle-path-stable limit cycles (see Galizia 2018 for a detailed exposition).

Policy implications

Such a view of economic instability has drastic implications for economic policy, as it changes our assessment of the best stabilisation policies in a recession. Because expansion phases tend to be too long, the economy almost necessarily ends up in a situation of over-accumulation (of capital, houses, and durable goods). There is then some truth in the Hayekian view on the need to 'liquidate' capital. Sustaining aggregate demand through stimulation policies is in a sense useless, as it simply postpones the recovery. For example, a policy of supporting the construction sector in Spain in 2008 would have been unproductive, since nearly 30% of the 3.5 million housing units built since 2001 were vacant. However, there is no guarantee that the liquidation driven purely by market forces would be socially optimal. In the economy that we have sketched in the previous paragraph, we can show formally that liquidations are inefficiently severe because, at root, the effect of individual spending decisions on aggregate unemployment risk not internalised. Although expenditure must be reduced, the economy is in a

situation of deficient demand, causing the recession to be too abrupt. In that sense, some Keynesian-type demand policy is desirable. This will slow down the liquidation and prolong the recession, but that path will be less costly because unemployment will be lower. There is a trade-off between the length and the severity of the recession, and the market does not choose the right balance between the two.

Such mechanisms, in a non-linear model, can also contribute to the debate on 'secular stagnation' launched by Summers (2013). Decentralised economies work well when they are far enough below their steady growth path – the capital stock (productive capital, housing, durable goods) is relatively low compared to the level of technology, which causes spending to be high and unemployment low, so that the absence of insurance against unemployment risk is almost irrelevant. But when the economy is prosperous and fluctuates around its stationary growth path, its capital needs are largely met (not in absolute terms, but relative to the level of technology) and the economy thus exists in a very different regime. Unemployment is high in recessions, demand is insufficient, and the economy displays endogenous cycles. It is somehow the fate of prosperous economies to go through booms and busts and to be in chronically deficient demand. If technological progress slows down, the economy finds itself in a situation of excess capital (relative to this new technological path), and therefore, through the mechanisms previously described, in a structural deficit of demand. However, such deficient demand cannot be eliminated by aggregate demand policy. Boosting demand would increase the stock of capital, housing, and durable goods, and therefore ultimately aggravate the shortfall in demand.

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6 Stimulus packages? Better be persistent!

Martial Dupaigne and Patrick Fève
Toulouse School of Economics

The financial and euro crises have reignited interest in whether fiscal stimulus is an effective policy to bring the economy back on trend. We show that the answer to this question crucially depends on how persistent the fiscal policy is. The interplay between expectations regarding future government spending and capital accumulation deeply affect the size of fiscal multipliers.

So-called (short-run) government spending multipliers, *i.e.* the response of current GDP to a unit increase in government spending, remain surrounded in empirical uncertainty (see Ramey 2011 for a survey) and vary with many factors such as the econometric approach, the identification strategy, the structural model, the state of the economy, and the nature and duration of the fiscal change (e.g. Cogan et al. 2010, Uhlig 2010, Christiano et al. 2011, Leeper et al. 2011, Auerbach and Gorodnichenko 2012, Coenen et al. 2012, Fève et al. 2013, Erceg and Lindé 2014, Canzoneri et al. 2016, Fève, and Sahuc 2016, Pappa et al. 2016, Ramey and Zubairy 2018).

Government spending forecastability shapes fiscal multipliers

Recent research has studied how the predictability of fiscal spending affects fiscal multipliers. Mc Kay and Reis (2016a, 2016b) focus on automatic stabilisers, such as unemployment insurance, which use stable rules to condition transfers to the state of economy. In Dupaigne and Fève (2016), we show that the forecastability of government purchases crucially shapes fiscal multipliers. Future predicted government spending drives investment following usual factor demand concerns, combined with crowding

out-like capital supply effects. A very short-lasting fiscal stimulus lacks any incentive to invest, as opposed to a more persistent stimulus. In the same vein, announced increases in government spending yield larger investment responses than unexpected ones.

The analytical tool we use to analyse the time profile of government spending is a relatively simple model including capital accumulation, elastic labour supply and stochastic government purchases. This model is sufficiently simple to get exact solutions that provide insightful analytical results. It nevertheless shares the key ingredients present in the dynamic stochastic general equilibrium (DSGE) literature (as in Coenen et al. 2012): the utility is separable between consumption and leisure (consumption and leisure are deliberately maintained as normal goods), a constant return-to-scale technology combines labour and capital inputs, and the stochastic process of non–productive government spending is exogenous and persistent.

With this laboratory in hand, we show that the persistence of government spending shapes short-run multipliers through the response of private investment. How does this investment channel operate? The fiscal stimulus, which acts as a drain on resources, has two opposite effects on investment. On the one hand, households want to smooth their consumption and eat into part of the existing capital (a crowding out-like effect). On the other hand, it stimulates employment (in our setup, through a standard negative wealth effect) and the marginal productivity of capital, increasing the demand for capital services. What matter for capital accumulation and investment are in fact the expectations of next-period labour input. The more persistent the shock, the larger is that expectation. Capital accumulation is therefore desirable when government spending and employment are highly persistent, while households facing very temporary □scal shocks exhibit negative savings. When the persistence parameter of government spending is equal to the degree of smoothing in equilibrium consumption, the crowding-out and crowding-in effects exactly cancel out. Conversely, highly persistent policy induces the crowding in to exceed the crowding out, and aggregate investment will increase.

We establish these analytical results under fully flexible prices. In this setup, fiscal stimulus first operates through labour supply. Turning to nominal rigidities as in the DSGE literature would have two consequences. First, a markup-induced shift in labour demand would magnify the response of employment to a government spending shock. Second, when monetary policy only targets price stability and prices are rigid, the real

interest rate would no longer increase after this shock. The usual crowding effect would disappear in this case, strengthening the investment channel.

The literature has progressed for analytics of fiscal multipliers, but in (repeated) static models with constant capital (as in Hall 2009, Woodford 2011, Fève et al. 2013). The resulting multiplier only results from the intra-temporal allocations (the marginal rate of substitution between consumption and leisure, the marginal productivity of labour and the aggregate resources constraint), and ignores expectations about the timing of government policy. In our more general setup, we first connect this concept of a constant capital multiplier to one in which expectations and adjustment of investment matter. We notably obtain that ignoring the investment channel and expectations about the profile of the fiscal stimulus may lead to underestimation of the true multipliers, especially when the policy is very persistent (as we observe with actual data).

Two thought experiments

We then enrich the analysis by considering two thought experiments. First, we single out the role of two key parameters of the model: how responsive (the growth of) consumption is to the real interest rate (the so-called intertemporal elasticity of substitution in consumption), and how sensitive hours worked are to the wage rate (the so-called Frisch elasticity of labour supply). The intertemporal elasticity of substitution in consumption only modifies the size of the constant capital multiplier, and does not alter the effects of the government spending driven by expectations. The elasticity of labour supply plays in two directions. First, when this elasticity is lower, the constant capital multiplier is smaller because the labour supply is less responsive after the negative income effect. Second, a lower elasticity of labour supply reduces the adjustment speed of consumption (for a given level of physical capital). This implies that the fiscal stimulus must persist for longer to ensure a positive response of saving.

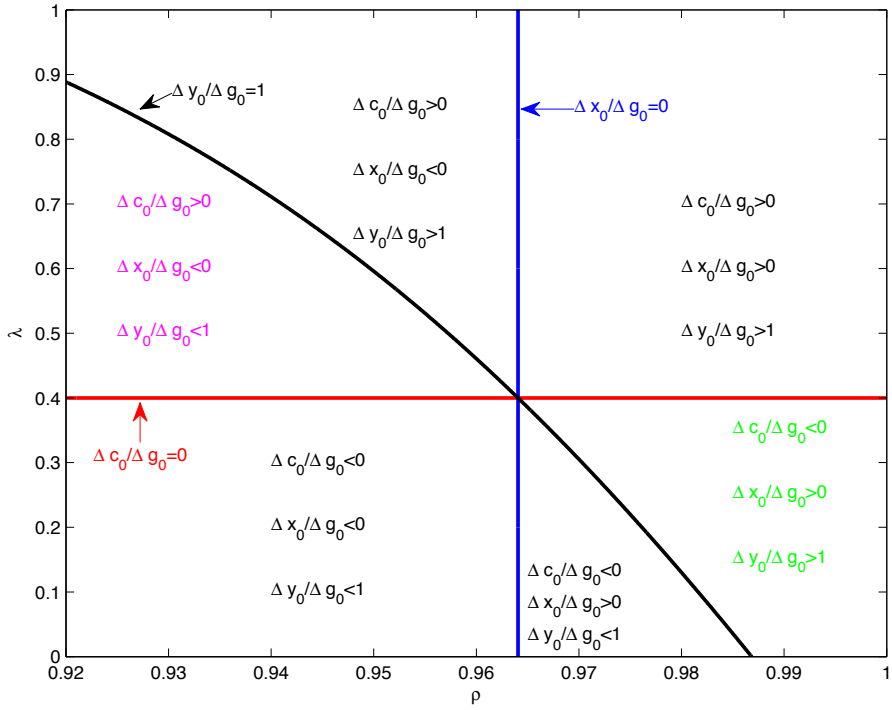
In our second experiment, we consider the existence of hand-to-mouth consumers (as in Gali et al. 2007), that is, agents who simply consume their income every period, as is observed in the data. We interpret this fact as a consequence of imperfections in financial markets. With this new setup, our previous results are magnified. When the fraction of these households is large enough, aggregate consumption may increase after

a government spending shock. However, a positive response of consumption is neither necessary nor sufficient to obtain an output multiplier above unity.

To see these results more precisely, Figure 1 represents the government spending multipliers of consumption, investment, and output for different combinations of fiscal stimulus persistence (ρ) and the share of hand-to-mouth consumers (λ). These multipliers are defined as the change in the corresponding variable – either consumption (Δc_0), investment (Δx_0), or output (Δy_0) – relative to the change in government spending (Δg_0) that originated the adjustment.

The black line displays all (λ, ρ) pairs such that the impact output multiplier equals unity. Below this line output reacts less than government spending, while above the line output reacts more. The red and the blue lines correspond to combinations of (λ, ρ) where the multiplier is zero for consumption and investment, respectively. Below these lines, the corresponding variable responds negatively to a government spending shock, while above these lines the response is positive. We see how the impact multiplier depends on both parameters, because the share of non-savers, λ, affects the constant capital multiplier and the persistence of government spending, ρ, shapes the impact response of investment. In the upper-right part of this locus, the short-run output multiplier exceeds unity. Two areas are interesting. In the lower-right part of the figure (in green), larger-than-unity output multipliers are obtained through increases in investment despite negative consumption multipliers. In contrast, the purple zone in the upper-left part features an increase in consumption. Yet, the output multiplier is below unity due to the negative response of investment triggered by a low persistence of government spending. Our analysis shows that a positive consumption multiplier is neither necessary nor sufficient to achieve an output multiplier above unity.

Figure 1 Persistence of government spending and non-Ricardian consumers affect fiscal multipliers



Conclusion

Our results have several implications for public policy.

First, they imply that short-lasting stimulus packages fail to stimulate one of the components of aggregate demand, namely, physical investment. It is interesting to note that for the estimated values of government spending persistence (i.e. the estimated first-order autoregressive coefficient), the response of investment is positive with our calibration. Hence, stimulus packages designed as increases in typical government spending should be preferred to specific, and shorter-lived, spending.

The second implication concerns the relevance of fiscal multipliers estimated using empirical approaches, such as structural vector autoregressions (SVARs). According to our results, structural models equipped to control for the persistence of the shock

deliver fiscal multiplier estimates which are useful for policy guidance (as in Leeper et al. 2011). Alternatively, assessing the effect of the persistence of government spending using natural and quasi-experimental identification strategies would constitute a fruitful avenue for future research.

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7 Reassessing tax policies and tax coordination: The case for a tax on automation

Pedro Teles
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One of the fiscal challenges in Europe, as in the rest of the developed world, is how to deal with the social impact of widespread automation. How can we make sure that the benefits from innovation in automation and artificial intelligence are not confined to only a few? Automation threatens to destroy many of our jobs:; this may be a reason to tax robots, the intermediate goods that are associated with automation, and artificial intelligence. Both the impact of automation on the job market in Europe, and possible policy remedies, have been discussed in different forums (e.g. McKinsey&Company 2017), and also in the European Parliament.[1]

In a paper produced as part of the ADEMU project (Guerreiro et al. 2018), my co-authors and I deal with precisely this issue. Who are the winners and losers from automation? And how can taxes be used to compensate the losers?

A good principle of optimal taxation is that taxes should not distort production. This means that intermediate goods should not be taxed. Since robots are intermediate goods, they should not be taxed. No restrictions should be put on automation.

But what if, as a result of automation, the jobs of a good part of the working population are destroyed on a large scale? What if we are not talking about just a few routine tasks or occupations, but rather all tasks that can possibly be automated? How can we prevent

1 See http://www.europarl.europa.eu/news/en/press-room/20170210IPR61808/robots-and-artificial-intelligence-meps-call-for-eu-wide-liability-rules

a large share of the population, instead of benefitting from progress, actually being made terribly poor?

Why should we tax robots?

Bill Gates recently came up with some thought-provoking ideas on this, calling for a tax on robots.[2] The European Parliament discussed such a tax a year ago and rejected it.

As it turns out, Bill Gates is right – for the wrong reasons, but he is right. Robots should be taxed.

So, what are the right reasons to tax robots? As the costs of automation go down, robots inevitably (unless a robot tax is used) replace routine labour. It turns out that it is not that easy to change occupations. If you are routine, how do you become non-routine? If you are not empathic, and not very creative, how can you find a job that a robot won't do better, and cheaper?

These are the people that we should make sure get compensated for their bad luck in being born with the skills that a robot can imitate, whether a secretary or a brain surgeon. There may be quite a lot of us.

How can we make sure that everyone benefits from automation? How can the distribution be done efficiently?

If we could tax different people differently, based on their type, then the problem, at least academically, would be easily solved. But we cannot. We can tax people based on their income, but not on their type. And that is a limited way to distribute.

In a seminal paper, economists Peter Diamond and James Mirrlees showed that good policy does not tax intermediate goods as long as all net trades can be taxed at different rates (Diamond and Mirrlees 1971). Different types of labour supplied are different net trades and therefore, in the model, they can be taxed at different rates. In the real world, that's tax discrimination, and the law typically does not allow for it. Because different people cannot be taxed at different rates, taxing robots may be the way to go. A tax on

2 See https://qz.com/911968/bill-gates-the-robot-that-takes-your-job-should-pay-taxes/

robots is a tax on the non-routine, and a subsidy for the routine, and even if it distorts production, it should be part of the fiscal policy mix.

In a different set up, in which the assumption of non-discriminatory taxation is justified by information constraints, good policy must make sure that the different types are happy with their allocated bundles. The tax on robots is used to make it easier to provide those incentives.

A tax system must ensure that the non-routine do in fact prefer to work hard, rather than earning the relatively low income of the routine, consequently paying less taxes, and working less. Raising the robot tax raises the pre-tax wage of the routine and lowers that of the non-routine, increasing the hours that the non-routine would have to work to earn the income of the routine.

Robot taxes are used because they change relative prices. And relative prices can relax the relevant information constraints.

How much should we tax robots?

So these are the reasons why taxing robots is a good idea. But how much should we tax?

That depends on how restricted the tax system is. If the only restrictions are information constraints, the answer is, not much. In our numerical examples, the tax rate would be at most 10%. But if there are additional restrictions, the rate could get all the way up to almost 40%.

If the tax system was restricted to be just like the one we have now, but more progressive, then despite the progressivity and high robot taxes, routine labour is still made relatively very poor by automation.

There is a better way to redistribute. A system with progressive taxes but with a universal transfer substantially reduces the costs of redistributing. The universal transfer is the

unconditional basic income that has recently been discussed, and dismissed, in the European Parliament; interestingly, also in the context of the perils from automation.[3]

Should robot taxes be coordinated in Europe? In order to be effective, there should be coordination on such taxes. The reason is that the incentives to compete over these taxes, in an attempt to reap the benefits of innovation in automation, are very strong.

Related ADEMU studies

Work as part of ADEMU on reassessing tax policies and tax coordination covers many other issues. Kehoe and Pastorino (2016) argue that there is no need for a union-level fiscal authority providing insurance against country-specific shocks if financial markets are well functioning. Chari et al. (2017a) summarise some of their work on the formation of the Economic and Monetary Union and on the recent challenges that it has faced, arguing that the key mechanism is lack of commitment. Correia (2016) analyses the implications for efficiency and equity of lower capital taxes due to tax competition. Chari et al. (2017b) compute optimal coordinated policies and discuss how tax systems can be designed to allow for flexibility in the setting of taxes by the different countries, and also impose the good principles of free trade and no taxes on capital. Valued added taxes with border adjustment are designed to ensure free trade. Conversely, taxation of capital income is high in almost every European country, and the design is flawed. The US is far ahead in this respect, with the new cash flow tax with investment deductions. A tax on capital income with a full investment deduction taxes the initial capital without distorting capital accumulation.

Other ADEMU papers on optimal taxation of labour and capital are Abrahám and Carceles-Poveda (2016), Caballe and Dumitrescu (2016), Reis and Panousi (2017), Kapička (2017), and Reis and Teles (2018).

3 The Committee on Legal Affairs of the European Parliament prepared a report stating that "in the light of the possible effects on the labour market of robotics and artificial intelligence a general basic income should be seriously considered".

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8 Banking Union and the ECB

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Since the creation of the euro area, price stability has been the primary objective of the European System of Central Banks (ESCB),[1] with the Eurosystem and the ECB, as its core institutions, being responsible for the implementation of monetary policy.[2] However, the recent financial and euro crises have highlighted a secondary mandate of the ESCB as one of the EU priorities, namely, the prudential supervision of credit institutions and the stability of the financial system.[3] Accordingly, a new legislative wave has endowed the ECB with additional powers regarding banking supervision.[4] In addition, decisive steps have been taken in developing a new set of institutions, embedded in the European Banking Union, to contribute to the fulfilment of this second mandate.

The relationship between the banking Union and the ECB is a key link in the Financial and Monetary Framework of the Economic and Monetary Union (EMU). In this chapter, I briefly review some of the research being done under the ADEMU project related to: i) the weaknesses of the current Banking Union-ECB design and its implementation; ii) the new roles of the ECB, and iii) the possible conflicts between the ECB-Banking Union and the national central banks (NCBs) or the corresponding national competent authorities (NCAs).

1 See Article 127(1) of the Treaty on the Functioning of the European Union (TFEU) (2016/C 202/01) and Article 2 of the Statute of the ESCB and the European Central Bank (ECB) (2012/C 326/230).

2 See Petit (2017) for a discussion of the mandates of the ECB as well as other major central banks.

3 See Article 127(5) of the TFEU.

4 See Article 1 of the Single Supervisory Mechanism Regulation (2013/L 287/63).

On the Banking Union-ECB design

The financial and euro crises made clear the close linkages between the banking sectors of the euro area member states and the high potential for contagion these linkages could create. These crises also highlighted the problems in the institutional design of the euro area associated with the tension between two opposite ideas. On the one hand, a currency area where a single monetary policy is combined with provisions for supervision and resolution of its banking sector managed at the country level could be ill designed. On the other hand, the integration of backstops and safety guards for the banking sector across the euro area could generate the wrong incentives and exacerbate free riding at the member state level.

The creation of the **European Banking Union** (EBU) is supposed to provide the optimal solution to this tension between risk sharing and moral hazard within the EMU. To achieve that goal, the EBU is designed around three pillars.

The Single Resolution Mechanism

First, there is the **Single Resolution Mechanism** (SRM), which centralises the European response to banks facing difficulties. The SRM will make use of the Single Resolution Fund (SRF) financed through contributions by the banking sector. The spirit of the SRM is that, unless there are severe systemic disruptions to the banking system, bank resolutions will make use of this fund and, therefore, there will be no need for bailouts in which public funds are needed. However, Yiatrou (2016) provides a closer look at the design for the use and targets of the fund in these resolutions. She argues that the existing provisions might not deliver adequate funding for every given bank resolution. This state of affairs implies that **the mechanism does not necessarily eliminate implicit government guarantees, which may have important consequences. First, it does not fully eliminate the connection between sovereigns and the banking sector. Second, it could fail to discipline banks' risk-taking incentives**. At the same time, Yiatrou recognises that implementing a fully credible regime would demand the channeling of a massive amount of funds which could significantly harm the profitability of banks. She concludes that the current setup seems to achieve a balance between its effects on risk-taking and the financial costs it imposes to banks.

The Single Supervisory Mechanism

The second pillar is the **Single Supervisory Mechanism** (SSM). This mechanism, granted to the ECB, has the role of monitoring the financial stability of banks. However, Monti and Petit (2016) question the legal basis of this mechanism. At a general level, these authors warn that existing Treaties do not include suitable provisions to empower the EU legislator with the capacity to create the elements of the EBU. Regarding the SSM in particular, the authors detect significant margins of discretion in the interpretation and implementation of supervisory standards both between the ECB and NCAs, and between the NCAs themselves.[5] Other aspects that need a reformulation involve possible overlaps between the regulatory powers of the ECB and the European Banking Authority (EBA) as well as possible asymmetries between euro area and non-euro area participants in the EBU.

Amtenbrink and Markakist (2017) also highlight deficiencies in the design of the SSM. In particular, they point out the lack of clear criteria against which to assess the ECB's performance in the area of banking supervision, as well as a gap in terms of the ability of the European Parliament to assign consequences to the ECB's conduct.

The European Deposit Insurance Scheme

The third pillar is the **European Deposit Insurance Scheme** (EDIS), which is at a standstill – possibly due to fears of it becoming an across-countries transfer system and/or exacerbating the inherent moral hazard problems. However, with the advent of the financial crisis, narrow banking has been proposed as another option to guarantee the value of deposits. This alternative has been heavily criticised as imposing unbearable costs on the banking industry. In Rodríguez Mendizábal (2016), I show how **a 100% reserve requirement could be implemented in our current monetary system.** At a general level, a necessary condition for this implementation not to impose a tax on banks has to do with the remuneration of required reserves at the same rate as the refinancing

5 For example, the *Five Presidents' Report* (Juncker et al. 2015) already recognised the need "to address the significant margin for discretion at the national level" regarding "the quality and composition of banks' capital" and calls for the necessary legal amendments.

operations of the central bank, a policy already followed by the Eurosystem. A second, and more stringent necessary condition is the disposal by banks of enough eligible collateral to pledge on these refinancing operations. Should this collateral constraint be overcome, the implementation of 100% reserve requirement would question the need to design a deposit guarantee scheme at the Banking Union level to prevent self-fulfilling bank runs.

On the new roles of the ECB

Within the Banking Union, **the ECB plays three roles.** The first one, already mentioned, is **as guarantor of the SSM.** Regarding this bank supervision role, Jungherr (2016) analyses the extent to which central banks should require commercial banks to reveal information to the public about their risk exposure. In this sense, starting in 2014, one of the key steps in the creation of the Banking Union was the ECB's *Asset Quality Review*, which published an assessment of capital shortfalls for the 130 most significant euro area banks.[6]

The author seeks to identify the relevant trade-offs in the optimal choice of transparency and to provide arguments for its regulation. On the one hand, transparency is beneficial as it generates market discipline and allows banks to commit to a prudent portfolio choice, which takes into account the potential costs of instability. On the other hand, transparency increases the risk of being exposed as a weak bank in the midst of a sudden downturn. Opacity provides some insurance against this risk. In Jungherr's model, mandatory public disclosure is socially beneficial in the presence of information spillovers between competing banks. Interestingly though, full disclosure maximises neither economic efficiency nor financial stability. Some degree of bank opacity is socially desirable.

6 Results of the *Asset Quality Review* since 2014 and of other supervisory measures can be found at https://www.bankingsupervision.europa.eu/banking/tasks/comprehensive_assessment/html/index.en.html

The second function of the ECB involves **being the authority responsible for monetary stability** – in particular as liquidity provider for the euro area, a role that, as Adao and Silva (2016) have shown, has been strengthened since the euro crisis with the observed increase in firms' cash holdings.[7]

The third role is **as the authority responsible for financial stability**, a mandate which, as mentioned above, has become very relevant, if not predominant, since the financial and euro crises. Following the steps of the Federal Reserve Board and the Bank of England, the ECB has actively pursued quantitative easing (QE) policies. However, it has not employed any credit easing policy such as the Term Asset-Backed Securities Loan Facility (TALF) implemented in 2009 by the Fed, which was a successful response to the freeze of the AAA-ABS market, and responsible for channelling a significant amount of funds for loans to households and small businesses. In fact, with TALF the Fed took a risk which needed to be backed up by the US Treasury, something unfeasible in the euro area.

Gaballo and Marimon (2016) interpret the AAA-ABS freeze as a high-interest, high-risk self-confirming equilibrium and show that a **credit-easing policy that includes a subsidy contingent on** lenders' losses – such **as** TALF – is **an optimal policy** that dissipates (pessimistic) misbeliefs, even when the central bank has the same misbeliefs as private creditors. An interesting feature of such a policy is that it will reveal and implement a low-interest, low-risk rational expectation equilibrium at no cost for the fiscal authority since, in such a case, lenders would not realise losses and no subsidy will actually be given. Of course, if such a low-interest, low-risk equilibrium does not exist, then the policy will bear a cost. But this cost, the authors argue, will be finite, making the social expected value of such experimental policy likely to be positive.

7 See Thiele (2017) for an analysis of the degree of independence of the ECB within its role in implementing monetary policy in the euro area.

On the possibility of conflict with national authorities

The variety of roles played by the ECB within and outside the Banking Union multiplies the possibilities for conflict with its national counterparts, either with NCAs within the SSM or with national central banks within the Eurosystem. Smits (2017) reviews some of these possibilities. An important difference between the two main tasks assigned to the ECB – namely, monetary policy and prudential supervision – is the different degree of reviewability and scope for juridification. Whereas the legal acts produced by the ECB when conducting prudential supervision can potentially be challenged in court, this does not seem to be the case with respect to monetary policy decisions (with some exceptions).

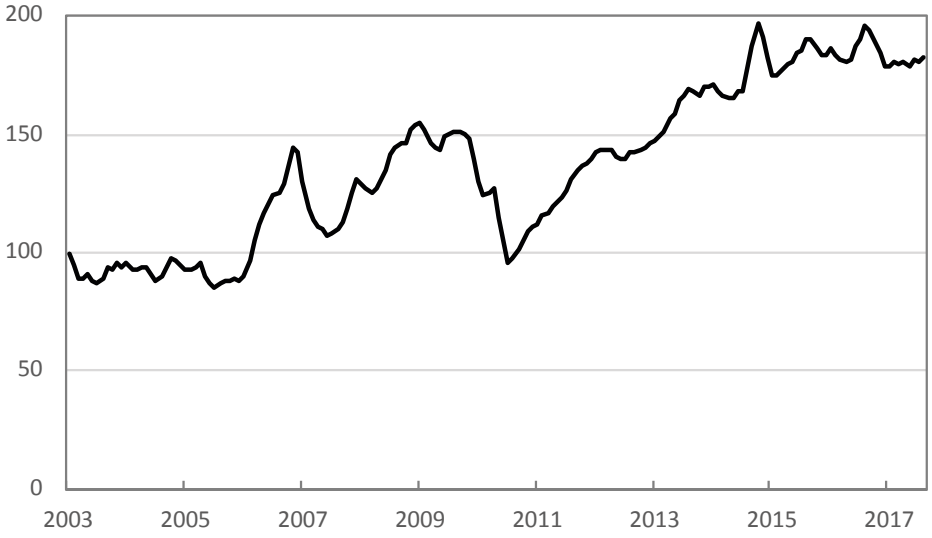
Regarding the sphere of monetary policy, the EMU design of decentralised implementation of centralised decision making may make the system prone to conflict between the ECB and the national central banks. Two such cases are gold and foreign reserves together with the Emergency Liquidity Assistance (ELA). First, while both the Treaty on the Functioning of the European Union (TFEU) and the Statute of the ESCB and ECB make clear that gold and foreign reserves are held and managed by the Eurosystem, statements by NCBs and further agreements within the union seem to suggest that they remain a national competence. Second, the decentralisation of the ELA in favour of the NBCs seems in contradiction with the competences assigned exclusively to the ECB by European law.

Finally, another area of divergence between the ECB and its national counterparts rests on the diverse regimes of supervisory liability. While many national competent authorities explicitly limit supervisory liability to cases of intent or gross negligence, the ECB exhibits full liability pursuant to Article 340 of the TFEU, and therefore contradicts these national regimes. Thus, a clarification and precision of the liability regime of the ECB within the SSM seems of utmost importance to diminish the scope for future conflict.

Conclusions

Arguably, the most obvious risk associated with possible deficiencies in the design of the European Banking Union is the resurgence of a national bias and the fragmentation of financial markets across the EU. In fact, as reminded by Danièle Nouy, the current Chair of the Supervisory Board of the Single Supervisory Mechanism, the recent financial crisis has plainly shown how fragile the apparent financial integration of the euro area was (Nouy 2015). As an example, Figure 1 presents a measure of financial fragmentation in the loan market in the euro area. It shows the dispersion in loan rates applied by credit institutions (also known as monetary financial institutions, or MFIs) to consumers across different countries in the euro area. We can see i) how this dispersion was present even before the financial crisis; ii) how it further increased with the beginning of the financial tensions in 2007; and, above all, iii) how it still remains at relatively high values more than ten years after the disruption in financial markets started. Similar conclusions can be drawn from certain measures of financial fragmentation also in money and bond markets (ECB 2017).

Figure 1 Cross-country standard deviation of MFI interest rates on consumer credit (loans between one and five years)



This apparent high elasticity for fragmentation of the financial landscape of the euro area presents a serious challenge in the design of the Banking Union as the result of the tension mentioned at the beginning of this chapter. The ADEMU research summarised here reviews several areas where progress could be made. In particular:

- care should be taken in designing institutions (i.e. the SRM and SSM) to provide the right incentives both to market participants and states avoiding possible conflicts with national counterparts; and
- possible new measures (i.e. narrow banking and credit easing policies) could contribute to alleviate financial tensions at zero or bearable costs.

The aim would be to improve risk sharing and to ensure a level playing field for all actors involved without promoting free-riding or strengthening the banking-sovereign nexus.

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is implemented by central banks may influence the behavior of short term interest rates. Another research area is international economics. He has worked on the analysis of exchange rate target zones and on evaluating the gains from monetary unions.

9 Financial stability: The role of macroprudential policies

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The belief held during the period of the Great Moderation that macroeconomic stability could be attained by monetary policy has been replaced by a growing consensus on the crucial role of macroprudential policies. The main goal of macroprudential policies is to promote financial stability by limiting excessive risks and vulnerabilities in the financial system. Macroprudential policies inherently represent a trade-off between efficiency and welfare losses ex ante in good times and the gains ex post should a crisis arise. Analysis of this trade-off has been the focus of research in the ADEMU project.

As the Great Recession was largely caused by a collateral crisis in financial markets, macroprudential policies targeting excessive leverage have received most attention in the literature. Geanakoplos (2009) and Geanakoplos and Fostel (2012) show that collateral rates or leverage are more important to economic activity and asset prices than interest rates. During a leverage cycle there is too much leverage in normal times and therefore asset prices are too high, and vice versa in bad times. The loan-to-value ratio on new loans changes dramatically over time, and its rapid change is an important source of economic crises. The leverage cycle makes returns riskier, and creates an inefficient mix of skills and allocation of resources in the economy. Gehrig and Levinsky (2018) confirm these theoretical results in a laboratory experiment.

Possibly the best policy to prevent a collateral crisis is to act before it occurs. Restricting leverage in good times might be a policy that can achieve this end. Such restrictions are supposed to complement risk-based capital requirements as a simple regulation to mitigate cyclical fluctuations and to decrease the risk of contagion in the financial system documented by Adrian and Shin (2010) and Brunnermeier and Pedersen (2009). Boháček (2017) derives endogenous leverage bounds arising from

adverse selection and moral hazard between borrowers and lenders in an environment with imperfect monitoring and default. Incentive compatible allocations are mapped into restrictions on margins for collateralised loans. These margins are used to simulate the macroprudential policies trade-off: in good times, restricting leverage is costly as it limits the efficient allocation of resources to their most productive use; on the other hand, accumulation of assets prevents excessive deleveraging during a recession or after a change in regulatory framework. Numerical simulations show that the efficiency costs are less than ½ percent of total output in the good state, while the gains are more than 8% during a simulated financial crisis.

Bianchi (2011) documents that over-borrowing externalities have a large quantitative impact on welfare. When agents fail to internalise the price effects of their borrowing decisions, collateral credit constraints in nontradable goods can induce sharp and sudden adjustments in access to foreign financing. When agents have accumulated a large amount of debt and a typical adverse shock hits, the economy suffers the typical dislocation associated with an emerging market crisis. This pecuniary externality can be corrected by reducing the amount of borrowing ex ante, either by a tax on debt or margin restrictions. Macroprudential policies (a simple tax on debt) imposed before a crisis can increase the amount of precautionary savings and reduce the incidence and severity of the crisis when it occurs.

Korinek and Simsek (2016) model the aggregate demand externality of excessive leverage. It is desirable to slow down the accumulation of leverage because borrowers who individually behave rationally undertake excessive leverage from a social point of view. Agents do not take into account general equilibrium effects. Greater ex ante leverage leads to a greater ex post reduction in aggregate demand and a deeper recession. This is because deleveraging transfers liquid wealth from borrowers to lenders when the former have a much higher marginal propensity to consume. A macroprudential policy restricting leverage could make all agents better off. Korinek and Simsek also show that when debt is collateralised by financial assets, a fire-sale externality exacerbates aggregate demand externalities, leading to a more severe deleveraging episode and a deeper recession.

To prevent episodes with household deleveraging and a subsequent liquidity trap, Farhi and Werning (2016) emphasise ex ante macroprudential restrictions on borrowing during the credit boom in order to alleviate the severity of the future crisis in the form of loan-to-value or debt-to-income ratios. In a currency union where monetary policy is constrained by a fixed exchange rate, capital controls can be used to smooth the business cycle. Similarly, when agents are subject to collateral constraints that depend on the terms of trade, taxes on capital inflows might be imposed in anticipation of binding collateral constraints. The authors offer a general theory for macroprudential policies based on nominal rigidities and constraints on monetary policy (the zero lower bound or a fixed exchange rate in a currency union). Instead of pecuniary externalities, their theory emphasises aggregate demand externalities. The optimal Pigouvian taxes provide incentives for agents to reallocate their wealth to states with higher marginal propensities to spend.

Unconventional policies might be required to alleviate the effects of the financial crisis. Gaballo and Marimon (2016) propose credit easing by targeted subsidies in a new theory of self-confirming equilibria. For monetary policy constrained at the zero bound, Molteni (2017) suggests an unconventional policy of swapping illiquid government bonds for highly liquid papers (short-term debt or money).

Direct purchases or collateralised loans might be necessary for a successful alleviation of contractionary effects of a liquidity shock. In an international setting, Molteni (2017) focuses on the role of funding liquidity – the ease with which investors can obtain funding against a collateral. Government bonds are the prime collateral securities in the European repo market, an essential source of funding for the banking system. During the financial crisis, the increase in counterparty credit risk led to a shift to secured funding backed by collateral. The resulting deleveraging channel had quantitatively large, negative effects on aggregate output and price levels. Rodriguez-Lopez (2018) studies how cross-country differences in asset liquidity affect the international allocation of economic activity. The model generates positive spillovers of the market for liquidity on the size and productivity of the sector that generates liquid assets. Similar to precautionary savings in a Bewley model, agents over-accumulate assets due to the liquidity services they might provide should potential opportunities to trade in the financial market occur.

Seoane and Yurdagul (2018) model small open economies subject to collateral constraints with endogenous borrowing limits. They study the role of demand shocks to international lending in a model where the collateral constraint depends on the tradable value of domestic income. They find procyclical optimal macroprudential capital controls (tax on foreign debt), similar to Fernández et al.'s (2015) capital controls that alleviate over-borrowing cycles.

The design of effective macroprudential policies might require international cooperation. Fornaro and Romei (2018) study countercyclical macroprudential policies that limit debt accumulation during booms to sustain aggregate demand and employment during liquidity traps triggered by deleveraging episodes. They show that these policies, while effective from the perspective of individual countries, might backfire if applied on a global scale. The reason is that prudential policies implemented by booming countries generate a rise in the global supply of savings or, equivalently, a fall in global aggregate demand, which exacerbates the recession in countries currently in a liquidity trap. A paradox of global thrift might arise because national governments do not internalise the impact of their actions on other countries.

Several papers in the ADEMU project analyse the effects of monetary policy during and after the Great Recession. Hedlund (2018) studies the effects of explicitly inflating away mortgage debt in a model of endogenously illiquid housing market with default. The generated inflation can boost house prices, reduce foreclosure activity, and accelerate the macroeconomic recovery. However, except for the case of fixed rate mortgages, the various inflationary channels cancel out and the overall effect is weak. Cui and Radde (2017) develop a monetary model with a search theory of asset market liquidity and endogenous financing constraints. As money relaxes financing constraints, private assets must pay an endogenous liquidity premium that rises with financing constraints. Shocks to the intermediation costs are essential to jointly capture the countercyclical liquidity premium, procyclical and volatile asset prices, and large fluctuations of macroeconomic variables as observed in the data.

The ADEMU project has shown that designing the optimal macroprudential policies is a demanding theoretical exercise based on important insights in market externalities. In economies with incomplete asset markets and credit constraints, a redistribution of asset holdings induces relative price changes in spot markets. These relative price

changes represent a pecuniary externality that is not internalised by otherwise rational private agents. Such inefficient equilibria can be improved by macroprudential policies in the form of taxes or restrictions on allocations. At the same time, it is important to study macroprudential policies as a trade-off between the ex ante losses in efficiency and welfare and the ex post gains during a crisis. The costs can be large as severe financial crises with deleveraging episodes are rare and highly uncertain events. Second, while often welfare-improving, simplified policy tools might have costly side effects. Macroprudential policies constrain efficient allocations and might limit not only excessive risk-taking but also innovations. For example, a simple interest rate policy that promotes a precautionary accumulation of collateral also affects agents whose allocations are efficient. A leverage regulation disadvantages borrowers with low savings and might actually push some of them towards alternative and riskier sources of borrowing (credit cards, unsecured loans, etc.). A higher interest rate might slow down economic growth and even generate a recession. These complex effects of optimal stabilisation policies illustrate the importance of the contribution that ADEMU research makes to the new macro-finance literature and to our understanding of macroprudential policies and their role in financial markets.

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10 The European Stability Mechanism: The path to reform

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While the European Stability Mechanism can be credited for having played a vital role in safeguarding the financial stability of the euro area and of its member states, thus discharging its mandate (Article 12(1) ESM Treaty), its design and operation have not escaped criticism:

- first, as an international treaty it lacks the usual accountability channels found in EU law, for example bypassing the European Parliament;
- second, the conditions attached to its loans attracted criticism for harming fundamental rights of EU nationals and eroding national democracies;
- third its governance structure gave large member states blocking votes, causing resentment about its operation;
- finally, the linkage with the IMF caused some friction with the EU institutions.

Post-crisis, how should the ESM be redesigned to ensure continued stability for the euro area? In this chapter, I start by contrasting two ambitious positions on the design of the European Stability Fund (ESF) that emerge from the member states. I then contrast these with the timid institutional proposals of the Commission and close by suggesting that retaining the ESM as an international treaty allows for a quicker process for achieving meaningful reforms.

Divergent national preferences

The two member states at the heart of European integration appear to have different views on the role of a European Stability Fund (*Financial Times* 2017). A 'German' vision for the ESF entails giving it greater power over member states: overseeing compliance with the fiscal compact and monitoring the implementation of the Stability and Growth Pact. Its technocratic design would replace the politicisation of the Quadriga (the decision-making group involving four institutions - the ESM, the IMF, the Commission, and the ECB) for countries receiving loans and the ineffective supervision of member states by the EU institutions. Successive enhancements of EU-level economic policy coordination have failed to prevent member states making poor policy choices (Leino and Saarenheimo 2016), but one has to wonder whether simply passing the task to another agency resolves the difficulty of enforcing rules on sovereign states when the policy choices at stake are so central to what a state does.

Perhaps an alternative would be to offer positive incentives for states to undertake important economic reforms (discussed by Steinbach 2016), or simply to place more hope in the softer forms of governance (for example, the review of national budgets) serving as a way for the EU to learn more about national priorities and engage in a constructive dialogue with states (Klipatrick 2016 suggests this possible reading). Substantively, the ESF would be able to engage in debt restructuring. This would complete the process begun with the introduction of Collective Action Clauses, required by the ESM Treaty (Martinelli 2016). Moreover, the ESF would serve as a fiscal backstop to the Single Resolution Framework.

In contrast, a 'French' vision aligns the ESF with the mandate of the IMF, whose role is "to give confidence to members" by providing them with resources so that the states do not have to "resort to measures destructive of national or international prosperity" (IMF Treaty, Article 1(v)). In this vision, funds would arrive before a crisis happens, to pay for structural reforms or to facilitate investment spending.

While it is hardly conceivable that either of these approaches would be embraced, they reveal a continued division on the causes of the crisis and on the best policy response: the German vision rests on better discipline ex ante, the French vision believes that solidarity among member states requires a means by which assistance can be afforded

to those states that need it. More technically, it is hard to see how these two proposals could be implemented within EU law absent a revision of the Treaties, which is not on the horizon. They remain, however, markers of what kinds of cures the euro area ideally needs to render it sustainable.

The Commission's proposal

The Commission's opening gambit is to opt for an institutional reconfiguration. The major move is to integrate most of the ESM Treaty into the EU Treaties. The renamed European Monetary Fund (EMF) would largely function as the ESM does now, only under EU law and not as an international organisation.

This raises two legal questions.

- The first is how far the Treaty provides a sound legal basis for the ESF. The Commission relies on the provision that confers competence to legislate should this prove necessary to attain the Treaty's objectives (Article 352 Treaty on the Functioning of the EU), but one might wonder, given that the ESM has served its purpose so far, whether it is necessary to integrate the ESF into EU law, in particular since no new tasks appear to be assigned to it which could only be achieved within the framework of EU law.
- The second is what sort of "unique legal entity" (European Commission 2017: 5) the ESF would be under EU law. This issue becomes more pertinent when we consider how the ESF would operate: if a member state requests stability support, the EMF's decisions to grant it and its approval of the Memorandum of Understanding are both subject to the Council's approval. In all but name, this turns the EMF into an agency, providing its advice to other EU institutions.

We should welcome the more innovative substantive reforms: extending the EMF to provide a fiscal backstop, and the commitment to carrying out a social impact assessment of the Memorandum of Understanding. Some might want to see a stronger footing for protecting social rights (Kilpatrick 2016). However, these important reforms

could be achieved by reforming the ESM Treaty. Moreover, it does not appear that the reform of the voting rules (80% as opposed to unanimity) will do much to accelerate decision-making or remove the power of the larger states.

How best to move forward?

The main problem with the Commission's existing proposal is that it is not clear that the reforms proposed are necessary – reforming the ESM Treaty could provide similar outcomes. Its lending policies have been controversial but also largely successful, and there are lessons to be learned which can be integrated within a reform of the Treaty (for an initial assessment, see Corsetti et al. 2017). Indeed, an internal and an external review recommended a number of modifications to enhance the ESM's legitimacy, and many of these adjustments are doable without major architectural reform (Transparency International 2017, Tumpel-Gugerell 2017), such as improving the ESM's governance and transparency and enhancing the legitimacy of the conditions set for member states receiving funds. This would appear an easier pathway that can achieve the same objectives as the Commission's proposal with less fuss, thus creating a more effective emergency mechanism. Deepening the ESM's risk-sharing function would be welcome but, as noted, one has to address the division among member states and the not insignificant factor that this probably requires amending the EU Treaties, a risky process given the political fragility of the EU today.

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11 The political economy of policy implementation

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As we have seen during the Greek crisis, for example, the Economic and Monetary Union is heavily influenced by political concerns and issues. Tools for studying the impact of political concerns on the EMU are inadequate.[1] The work of ADEMU in the area of political economy has been to develop the theory needed to deal with these issues. In this chapter, we lay out some of the main concerns and questions and indicate how ADEMU's political economy research has created a framework for addressing them. We focus on rent seeking in the banking sector.

Rent seeking in the banking sector

To understand the political economy of monetary policy and monetary unions, it is necessary to take a step back and examine how modern monetary systems create opportunities for rent-seeking in both the public and private sectors. Governments maintain substantial monopoly power over money. To enhance this power, governments interfere in borrowing and lending markets in a variety of ways, ranging from issuing taxpayer-backed debt to imposing controls over the issuance of securities of virtually every type. There are positive reasons for the role of government – concerns over market stability (fighting recession, lender of last resort) and raising government revenue (the inflation tax). There are also negative reasons – monopoly and the regulation associated with it creates opportunities for government officials to seek rents.

1 Katsimi and Moutos (2010) document the political dimensions – notable also in their paper is the absence of theoretical analysis.

Much of the monopoly power in the monetary sector is decentralised in private banking. The banking sector is regulated by requiring banks to hold government licenses and to abide by a variety of government regulations concerning the types of economic activities allowed and the structure of investment portfolios permitted. This regulation both limits and enhances opportunities for private-sector and public-sector rent seeking. The primary regulatory agency charged with overseeing these controls is the central bank. To reduce public-sector rent seeking, central banks are supposed to be 'independent' of direct political control. There is a large literature in economics on the importance of central bank independence from politics. As has become clear, unfortunately, central banks are far from independent from *private*-sector rent seeking. In case the problem of appointing bankers to head central banks is not clear, a salutary story from the US may clarify the impact of private bank rent seeking on central banks. On 16 September 2008 the US central bank – under pressure from the Secretary of the Treasury, a former CEO of Goldman Sachs – bailed out the insurance group AIG. It later emerged that the primary purpose of this bailout was to save the creditors of AIG – most important among them, Goldman Sachs.

The banking sector has been extremely innovative in defeating measures designed to combat rent seeking and this poses a problem both to taxpayers who get to pay the bills and to the stability of the system. Bankers construct high leverage portfolios that give high immediate returns with a small risk of catastrophic failure. The high return is pocketed in part by bankers in the form of high salaries and bonuses and in a variety of political payoffs, ranging from subsidised financing for political parties and politicians, to high-paying, undemanding jobs for retired government officials. Unfortunately, when the catastrophic failure occurs, the cost is largely borne by taxpayers. Investors have a somewhat intermediate position – they also wish to profit from public subsidies, but hope to pocket the money themselves and not have it go into the pocket of the bankers.

Regulatory capture and collusive groups

The heart of the political problem in banking is the capture of regulatory institutions – those charged with supervising the monetary institutions are suborned by the institutions they are supposed to regulate.

The problem of corruption is well recognised and has given rise to a number of populist political movements, including Podemos in Spain and Cinque Stelle in Italy. The policies proposed by these movements – withdrawal from the monetary union, public policy set by referendum – are unlikely to have much impact. This leaves open the question of what policies are likely to work and whether the popular discontent in these political movements can be harnessed to improve matters.

To get to grips with what might be feasible, we start by observing that public officials and politicians do not operate in isolation. While individual banks can be influential with regulators and governments and can suborn the system in a variety of ways, there are many banks and it is bankers collectively who pose the greatest threat to both taxpayers and system stability. Bankers can and do collude in their efforts, yet each has an incentive to let the other bankers do the work. And so it is with public officials, few of whom are individually influential, but who as a group wield great power.

Our primary emphasis was on developing tools to study the internal incentives of collusive groups such as bankers, public officials and political parties. This strong theoretical understanding is leading to an empirical understanding of how these groups operate and how they compete with one another. Ultimately, this will make it possible to design institutions which mitigate the harm and enhance the good that these groups do.

Disrupting versus enhancing collusion

Collusive groups endogenously generate and enforce social norms that achieve group objectives. There are two sides of this coin. On the one hand, if groups such as bankers or public officials are engaged in rent seeking, disrupting their ability to collude – for example, through policies that make it more difficult to monitor each other – can reduce undesirable behaviour. On the other hand, groups can design positive incentives as well as negative incentives. This means that if threats against the group as a whole cause them to change their objectives, then it is desirable to enhance rather than inhibit their ability to collude.

A case in point is the EU rule that prohibits tax-financed subsidies of particular industries, banking in particular. This has been used to prevent members state governments from bailing out banks. An Italian response to this rule is of interest – the Atlante initiative taxed successful banks to pay for failing banks. It is unclear whether this is a genuine initiative or simply a legal cover for government subsidisation (for example, by implicitly or explicitly promising the successful banks future government favour in exchange for short-term funding). If the initiative was real, then on the face it is a nonsensical – the malincentives of taxing the winners to pay the losers should be self-evident. If we view this through the lens of collusive lobbying, however, the issue is less clear-cut. The successful banks are 'guilty' of something – they are guilty of lobbying efforts that made it possible for large-scale banking failures. If banks believe that in the future they will collectively be responsible for failing banks, then they have incentive to lobby for regulation – such as increased leverage requirements – that reduces the ability of their competitors to drag them under.

This is one example of how changing group incentives can act to subvert subversion. There are broader threats that could be effective as well. For example, if populist movements such as Podemos or Cinque Stelle were to push for a periodic audit of taxpayer money used to subsidise the banking sector with the threat of criminal penalties against public and private officials in response to a failed audit, these officials and bankers would have an incentive to collude to promote good rather than bad behaviour. The policy of jailing bankers and officials in response to banking crises has been used with substantial success in a number of countries such as Chile.

Economic theory at this point does not provide good answers about how collusive organisations operate. The heart of our work has been to address the issue of collusive groups – bankers, government officials, political parties and other collective entities – to see what sort of policies and regulations are likely to succeed in the face of rent seeking. We are developing theoretical tools and beginning the process of applying them to practical problems.[2] Among our tentative initial findings is the idea that increasing the

2 Theoretical tools are developed in Dutta et al. (2016) examining the nature of equilibrium between self-organising groups and Levine and Modica (2015) studying the nature of incentives and enforcement schemes that may be used by self-organizing groups.

cost of lobbying favours special interests, while decreasing the cost of lobbying levels the playing field between special interests and broad general interests.[3] With reference specifically to the EMU, a substantial amount of independence of central banks from the political process has been achieved through institutional design. It seems that independence from the banking sector could be improved, for example by restricting the appointment of former bankers to central bank positions and by strong prohibitions on former officials joining banks.

Conclusions

There is a broad picture of political contests emerging from our work. The relative influence of large and small groups depends to a key extent on whether participation by individuals is a chore (meaning that there is a fixed cost of participating) or a duty (meaning that there is a benefit to the individual of at least a modest level of participation).[4] We generally think of lobbying as a chore and voting as a duty – but this need not be the case. For example, if we could establish as a social norm that active participation in lobbying of public officials is a civic duty, this would shift advantage away from smaller, special interest groups towards larger, common interest groups.

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12 A new fiscal and monetary framework for the EMU? The EU presidents' roadmap in 2018

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In December 2012, almost in the midst of the euro crisis, Herman. Van Rompuy, in collaboration with three other presidents of the EU, traced out a roadmap "Towards a genuine Economic and Monetary Union" (Van Rompuy et al. 2012), which was then followed by the *Five Presidents' Report* in June 2015 (Juncker et al. 2015), and subsequently further discussed and developed by the European Commission (2017a, 2017b, 2017c). This chapter provides a short (personal) assessment of this roadmap, mostly based on the experience of these years and the research of the Horizon 2020 ADEMU project, which started with this aim in June 2015. It concludes with a proposal to strengthen the Economic and Fiscal Union (see Chapter 2 of this eBook).

According to the roadmap, Europe's *Economic and Monetary Union* is, and will continue to be, formed by three unions: the *Monetary Union*, the *Economic and Fiscal Union,* and the *Financial Union*. The Financial Union, in turn, encompasses the *Banking Union* and the *Capital Markets Union*. The pursuit of growth and stability, beyond what member countries can achieve on their own, is the *raison d'être* of the EMU. This defines a goal for each of the three unions: the pursuit of price stability, economic stability and financial stability, respectively.

The reason the EMU can do better than the sum of its parts is based on its potential capacity to i) avoid inefficient fragmentations (e.g. of currencies, economic regulations, and financial markets, respectively, for the unions; ii) endogenise externalities within

the single market (e.g. competitive devaluations, fiscal dumping and social spillovers, and financial contagion, respectively); and iii) confront time-inconsistency problems.[1] The latter is especially relevant to our discussion.

EMU – originally a monetary union -- emerged not as the design of an 'optimal currency area', but to solve the time-inconsistency problem of monetary policy: the temptation to disrupt price stability *ex post* by generating inflation episodes (and competitive devaluations) (Chari et al. 2016, 2017). The Financial Union has its own time-inconsistency problems to confront: the temptation to bailout 'locally too big to fail' firms and banks, and to transform private liabilities into public liabilities (and also to avoid domestic sovereign debt problems becoming a burden on domestic private investors). Similarly, the Economic and Fiscal Union has a major time-inconsistency to confront: the temptation not to follow proper counter-cyclical policies in good times, and the inability to do so in bad times without incurring 'excessive' debts.

In fact, time-inconsistency problems also imply that it may not be easy to draw the lines between the three unions. In other words, even if a union policy might be more credible than a state policy, if it doesn't succeed in solving its time-inconsistency problems, these will spill over into the other unions. In particular, if the Financial Union does not break the link between private and public financial liabilities, the Fiscal and/or the Monetary Union will need to take care of them. Similarly, insufficient counter-cyclical fiscal policies can result in excessive debts becoming a burden to monetary stability (and in debt crises, if the monetary authority sticks to its mandate).

Furthermore, a time-inconsistency problem arises even within the fiscal union of a federal state. Political scientists refer to 'Hamilton's Paradox' (Rodden 2006),[2] according to which "the problem of federations may not be so much that the federal level is weak but that it is not credibly weak. Hence, it is taken for a free ride by lower-tier governments, forcing the federal government's hand to bail them out with central resources" (Schelkle 2016).

1 There are additional advantages, such as improving (or minimising the loss of) the competitive advantage of the EU in the global economy

2 See also Sargent (2012).

The list of concerns is not complete without accounting for some negative side effects which union may entail, such as: i) the major exposure of global shocks (financial, migration, etc.), ii) the minor capacity to react to local shocks (i.e. with a common currency and strict fiscal restrictions), and iii) exacerbating moral hazard problems (e.g. excessive borrowing or risk-taking, lessening the responsibility of national politicians).

In the original design of the Economic and Monetary Union there was almost no reference to the fiscal and financial unions, as if it were enough to set debt and deficit constraints (what became first the Maastricht euro entry conditions, and later the Stability and Growth Pact) and a 'no bailout of sovereign debts' clause in the Treaties to draw the dividing lines with 'the other unions' and not cross them. Possibly to make the euro politically feasible, the list of concerns was short.

The euro crisis has been a major 'stress test' for the EMU – internal European fault lines have been opened up by an external financial crisis, the lines across the EMU unions have been crossed, and the Economic and Fiscal Union has been shown to not be immune to Hamilton's Paradox. As mentioned above, the EU presidents' roadmap extended the EMU design to cover the three unions, and progress along the roadmap route has been made in recent years. Is it enough to avoid further undesired 'stress tests'? If not, would the completion of the roadmap be enough? Or, alternatively, are there reasons why the roadmap will not, or should not, even be completed? If so, how should we proceed? But before addressing these questions, it is helpful to note that the above strengths, or potential capacities, and problems – particularly of credibility – are also present in advanced federal states.

Not surprisingly, versions of the three EMU unions, with their institutions, also reflect the fiscal, monetary and financial frameworks of developed countries, such as the US. In fact, the more mature Monetary Union and the infant Financial Union share many similarities with similar unions elsewhere. The ECB, as the core institution of the Monetary Union, is an improved design of central bank independence, and it has succeeded during the recent crises not only in maintaining its mandate of price stability (actually, with periods below the target, which has not helped indebted countries), but also in allowing positive spillovers into the other two unions. It provided the Financial Union with much-needed liquidity in the euro area banking sector, and took on board the Single Supervisory Mechanism, while maintaining the dividing line with the

Monetary Union. It aided the Economic and Fiscal Union by defusing the euro debt crisis in the Summer of 2012, promising "whatever it takes" to save the euro, and it took on (selected) debts of 'stressed countries'. In sum, the ECB has emerged from the euro crisis as the strongest – and possibly most trusted – EMU institution.[3]

The Single Supervisory Mechanism (SSM), the (more idiosyncratic) Single Resolution Mechanism (SRM) and the planned European Deposit Insurance Scheme, together with Basel regulations, are complementary mechanisms and regulations aimed at balancing financial development and stability; their strengths and weaknesses are not qualitatively different from similar institutions and regulations in developed countries, except in their degree of (political) complexity and incompleteness.[4] For example, in contrast to the ECB, political accountability of the SRM is not exercised at 'arm's length' but rather 'hands on', in single bank resolutions over a weekend. Incompleteness means that the SRM is still short of guaranteeing the dividing line between private and public liabilities, or that a deposit in euros is worth the same no matter where the bank is within the EMU. According to the current version of the roadmap, this will not only require backup by the private banking sector but also the existence of a 'fiscal backstop', i.e. relying on the Economic and Fiscal Union! The Banking Union is still in its infancy (even more so is the Capital Markets Union, although it should require less institutional development) and, therefore, it is too early to say whether the limitations already detected will be overcome with experience or will become obstacles to fulfilling the Financial Union objectives.

However, it is the Economic and Fiscal Union which is remarkably different from its corresponding unions in advanced economies and federal states. The roadmap sets out some steps that would make it more similar, but even on completion of the roadmap, it would nevertheless remain very different (not that homogeneity with federal states such as the US should be the goal). The EU is not a federal state: "I am a citizen of the EU

3 Even Eurosceptic parties – such as Cinque Stelle and La Lega in Italy – have refrained from criticising the ECB when they have become winning political parties in a major euro area country.

4 See Chapter 8 in this eBook, and the ADEMU Working Papers referenced therein, for a more detailed assessment of the European Banking Union. In particular, note that the author's vindication of a 'narrow banking design' also applies to other developed nation banking systems (Rodriguez Mendizabal 2016).

because I am a citizen of an EU member country; similarly, I am a citizen of the euro area because I am a citizen of a euro area country". Beyond this fundamental difference, stressing the role of the states in the EU, there are differences that set the Economic and Fiscal Union apart – in particular, there are no EU (or euro area) taxes or debts, and the EU budget as a share of GDP is minimal (the euro area budget being nil), while in the member states it is not. Furthermore, there is no treasury or formal fiscal authority that coordinates, links, or simply 'talks with' the ECB, except for the 'informal' ECOFIN and euro area Council . The roadmap is supposed to take care of this lack of a formal fiscal authority, but does not contemplate substantial changes relating to the other differences.

The two key elements of the Economic and Fiscal Union are the Stability and Growth Pact (SGP), which together with the Fiscal Compact should guarantee that member states follow countercyclical fiscal policies in normal times by limiting their deficit and debt capacity, and the European Stability Mechanism (ESM), the first important step in the roadmap launched in 2012 as a crisis resolution mechanism for member states suffering crises threatening the stability of the euro area.

The SGP is complemented by two surveillance mechanisms under the lead of the European Commission. The first is the Macroeconomic Imbalance Procedure (MIP), established in 2011. This is aimed at detecting and preventing risks, implicit liabilities and macroeconomic imbalances, which can trigger the 'excessive imbalance procedure', with the European Council requiring a corrective action plan for any country that deviates from the MIP recommendations. The second is the European Semester (launched in 2011), where the European Commission provides periodic feedback and 'warnings' to EU member states regarding their SGP and other economic policies recommended by the Council. If there are persistent 'excessive economic imbalances', the semester can trigger financial 'sanctions' of up to 0.5% of GDP. In addition, following the roadmap, the independent advisory European Fiscal Board (EFB) was established in 2015 with

the objective of providing external advice and assessments to the Commission regarding the evolution of the Economic and Fiscal Union, and cooperating with the national Independent Fiscal Councils.[5]

In sum, the main objective of the Economic and Fiscal Union – namely, economic stability – is in the hands of the member states (as stressed in European Commission 2017d). To confront the underlying time-inconsistency problem (i.e. not following proper counter-cyclical fiscal policies) and, in particular, to guarantee that the Stability and Growth Pact will be respected, there is an elaborate and detailed apparatus of surveillance, advice and possible sanctions. Supposedly, the Fiscal Compact should have played an enforcement role by giving the SGP constitutional status, as it has been done in a few countries (e.g. Spain) and, supposedly, the SGP should have improved since 2015 with its additional flexibility and its capacity to exercise pecuniary sanctions. In practice, sanctions – which must be imposed by the Council on one of its members – do not take place, and the complex surveillance system does not go much beyond providing information and advice, 'peer pressure', and a forum for policy coordination. All these elements are valuable, but do not amount to a credible mechanism to enforce stabilisation policies in the euro area. There are three elements that are worrisome:

- First and foremost, a mechanism to avoid time-inconsistency problems (i.e. not doing ex post what was agreed ex ante) typically has rewards and punishments ('carrots' and 'sticks') conditional on observed performance. The current SGP mechanism has no 'carrots' and cannot credibly use its 'sticks'.[6]
- By mixing the 'watch-dog' surveillance with a non-credible sanctioning mechanism, there is a danger that the information about countries' performance gets distorted or, even if it does not, that it loses value – in contrast, for example, with the information that could be produced by an independent institution (e.g. the EFB) with the same professional capacity.

5 See Beetsma and Debrun (2018) for an assessment of existing Independent Fiscal Councils and the role of the EFB.

6 European Commission (2017c) refers to a "European Investment Protection Scheme" and a "European Uneployment Reinsurance Scheme", together with loans from the ESM and grants from the EU budget, as instruments of a future 'Stabilisation Function". More details are needed to assess them, but they seem to be designed to 'fill in holes' (countercyclically, but in a fairly disperse – although EC-controlled – manner), rather than being a 'stabilisation carrot'.

- Conversely, while looking into a broad range of policies and economic indicators is good practice for an observatory of the economy, having the more political Commission doing it may backfire, since it may be perceived as excessive micro-advising, and as 'telling sovereign states what to do' on a broader set of policies. In other words, it can work as long as national governments can use the Commission's warnings as an excuse to apply necessary but unpopular policies (by blaming the Commission), but it may backfire otherwise.

Of a very different nature and effectiveness is the other main mechanism of the Economic and Fiscal Union, the European Stability Mechanism. While this has 'carrots' (financial assistance), they can only be used in the case of a severe crisis and under *ex ante* conditionality conditions (typically, agreement to a reform/austerity programme). This mechanism has worked and has played a major role in the euro crisis – in particular, providing financial assistance to Greece (ongoing), Cyprus, Portugal, Ireland, and Spain. For example, the ESM holds more than one third of Greece's sovereign debt, which has been transformed into long-term (over 30 years) debt. In fact, it has provided more generous and effective assistance to Greece than the IMF has (Corsetti *et al.* 2017). However, given that the ESM effectively now has long-term contracts with these countries, there are two aspects in which these contracts could be improved:

- *Make the loan contract counter-cyclical*. Spain received financial assistance to solve its banking crisis (in 2012-2013, it used €41.3 billion out of the €100 billion made available). In recent years, the country has been growing relatively fast and has started to repay its loan earlier than required, for which it had to ask permission (which was conceded) on seven occasions. An optimal long-term contract would not have simply conceded, it would have required a higher repayment in those years of higher growth. What will happen 30 years from now with the Greek debt?
- *Make the conditionality ex post, not ex ante.* A counter-cyclical debt contract is a stabilisation contract that effectively provides risk sharing, and should not result in permanent transfers. Properly designed, this contract dominates the existing unconditional long-term contracts, creating incentives for the borrowing country to always satisfy its payments and not default. Furthermore, it can also be designed to address moral hazard problems (i.e. to provide the right incentives to implement needed reforms). These ex post incentives are more effective than the current ex

ante conditional programmes, which tend to depress consumption.

In sum, even in its current design and limited scope (i.e. as a crisis resolution mechanism), by modifying the terms of its contracts the ESM can be a more effective stabilisation mechanism, enhancing its contribution to the Economic and Fiscal Union. Of course, it can also do much more…

The *Four Presidents' Report* (Van Rompuy 2012) called for *"[i]mproving the resilience of EMU through the creation of a shock-absorption function at the central level"* in Stage 3 (post-2014), and the *Five Presidents' Report* (Juncker et al. 2015) stressed:

> *"…all mature Monetary Unions have put in place a common macroeconomic stabilization function to better deal with shocks that cannot be managed at the national level alone",*

but added:

> *"This would be a natural development for the euro area in the longer term and under the conditions explained above, i.e. as the culmination of a process of convergence and further pooling of decision-making on national budgets."*

The idea that '"the EMU would bring convergence across the euro area countries and, in turn, convergence, will make the further development of EMU easier" is an old idea going back to original designs of the EMU. However, it is counterfactual; the euro crisis, for example, has shown a divided euro area, and 'mature monetary unions such as US have had very limited convergence. Furthermore, convergence is not a necessary condition to establish a well-functioning stabilisation mechanism (i.e. risk sharing) that does not generate persistent transfers across countries; nor is it necessary that there should be "further pooling of decision-making on national budgets". More importantly, setting these presidents' preconditions may effectively mean that the 'shock-absorption function' will be postponed *sine die*.

In contrast, the proposal to establish a European Stability Fund, presented and discussed in Chapter 2 of this eBook is an ambitious proposal based on 'constrained efficient mechanism design', allowing the Economic and Fiscal Union to satisfy its 'economic stability' function without generating persistent undesired transfers across

countries; however, an important step for its development consists simply in extending the ESM contracts to risk-sharing contracts in normal times and improving their design as mentioned above (i.e. integrating the crisis resolution and risk-sharing functions in one fund with better contracts). Like the current ESM, the ESF does not require that all euro area countries participate at the outset, and it does not require them to suffer a severe crisis in order to participate.

It should be noted that there is a qualitative difference between managing an ESF contract – say, a share of a country's debt[7] – and the current 'surveillance with sanctions' SGP mechanism. First, the ESF contract itself is a counter-cyclical policy; second, it is in the interest of the ESF to properly design the contract and guarantee those conditional payments and transfers, which make the contract safe. Again, this is only one step ahead of the current ESM practice, and therefore there is no need to postpone it *sine die*.

As the ESM has been successfully used to confront specific banking crises, the ESF could also design contracts for specific markets, such as the labour market. As has been discussed in Chapter 3 of this eBook, substantial welfare improvements would be made possible by introducing a European Unemployment Insurance System (EUIS), possibly starting off with a subset of EU countries who could complement it. The underlying contract with a participating country has a simpler ex post conditionality structure (a fixed replacement rate applied to every eligible unemployed and fixed labour tax rate), but it is highly counter-cyclical, providing risk sharing since the country's EUIS contract should only break even in expected terms. From the perspective of optimal contract design there is room for improvement, however in this case a simple modification of the existing systems may be easier to get agreement upon, and to implement.

Last year, the European Commission "encourage[d] a discussion on the specific design of a 'stabilisation function'" (European Commission 2017c) and proposed several "options". The ESF proposal outlined above responds to this 'call for ideas'. More details are needed to assess the Commission proposal, but it is worth to, briefly and

7 As discussed in Chapter 2 of this eBook and in more detail in Abraham et al. (2018), and as is the case right now – for example with Greece – the ESF could manage only a fraction of a country's debt, but taking into account the country's overall indebtedness. Only in cases of extreme over-borrowing will this require debt restructuring as a pre-entry condition.

provisionally, compare it with the ESF. The Commission's "stabilisation function" is based on three "options": a "European Investment Protection Scheme", a "European Unemployment Reinsurance Scheme", and a "rainy day fund". In addition, the Commission also considers loans from the ESM and grants from the EU budget, with "a dedicated vehicle managed by the Commission [bringing] together different sources of funding at European level in an efficient way to provide the stabilisation function" and "[s]ubject to strict eligibility criteria, the Member State facing a large asymmetric shock would automatically be entitled to benefit from the assistance provided through the stabilisation function" (European Commission 2017d).

In this eBook we have already discussed a possible European Unemployment Insurance System (EUIS) in Chapter 3 and I just mentioned above that its EU fund component could be integrated in the ESF. Similarly, in Chapter 2 it has been argued that a 'rainy day fund' was nothing more than a very restricted version of the proposed ESF.[8] To foster growth and, in particular, to overcome existing socioeconomic divisions within the EU, European strategic investments can be a valid policy (i.e. the already existing European Fund for Strategic Investments, or EFSI), but the role of a "European Investment Protection Scheme" as a stabilisation policy is less clear. In particular, if the funds a country receives to continue its 'strategic investments' in times of crisis take the form of a loan, the ESF contract should take care of this, and more efficiently than with a non-contingent debt contract. Alternatively, if the funds take the form of grants or of EU investment transfers, then they should be considered part of other EU policies (EFSI, 'structural funds', 'R&D and innovation policy', etc.). Otherwise, they are likely to violate the principle that "the [stabilization] function should not lead to permanent transfers" (European Commission 2017c), or the principle that a country should have ownership of its own 'strategic investments', unless they are joint EU investments.

The main differences between the two proposals are that (*i*) the ESF is an integrated institutional and contractual proposal which embeds the current ESM, while the European Commissions' 'stabilisation function' is separated from the ESM and relies on a "dedicated vehicle", which coordinates the three "options", provides grants, loans

8 The Commission only mentions that the "rainy day fund could accumulate funds from Member States on a regular basis and disbursements would be triggered on a pre-defined basis" (European Commission 2017d).

with the support of the ESM, and so on;[9] (*ii*) the ESF does not require EU budget funding, while the EC's grants should come from the EU budget; and (*iii*) any EU country can subscribe an ESF contract (with its corresponding risk assessment), while the Commission's 'stabilisation function' has "strict eligibility criteria".

In summary, in spite of the euro crisis and Brexit – indeed, due in part to these events – important steps have been taken "[t]owards a genuine Economic and Monetary Union" since Van Rompuy, in collaboration with three other presidents of the EU, traced their roadmap for the EMU. Mostly based on the recent experience of the EMU and the ADEMU research, I have emphasised:

- First, the important role that properly addressing credibility problems has in the EMU design – this was already true in the establishment of the euro, but it is even more true in the overall EMU design, but it was not very explicit in the presidents' roadmap;
- Second, three aspects concerning the three unions that form EMU: 1) the key role of the ECB as the main institution, not only of the Monetary Union but of the Economic and Monetary Union; 2) the need to complete the Financial Union, basically 'according to the roadmap', although with some caveats regarding its complexity and incompleteness, and 3) the importance of properly addressing the 'economic stability' function of the Economic and Fiscal Union, and in particular, the opportunity to establish, from the current ESM, a second leading institution within the EMU for which the ADEMU project has provided a theoretical and quantitative foundation, namely, a European Stability Fund.

Furthermore, the ESF could also act as a fund for other EMU needs and policies. One – to be the 'backstop for the Single Resolution Mechanism' – is in the roadmap, another – to develop a European Unemployment Insurance System - is in the policy debate to which ADEMU research has also contributed.

9 The "dedicated vehicle" is even less defined than the 'unique legal entity' proposed by the European Commission as the legal institutional form of the ESM, transformed into a European Monetary Fund; see Chapter 10 in this eBook for a discussion of the latter.

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About the author

For information about the author, see the "About the authors" section in the introduction to this eBook.

This eBook provides an overview of the findings and proposals of the Horizon 2020 ADEMU research project (June 2015 – May 2018). The main aim of the project was to reassess the fiscal and monetary framework of the European Economic Monetary Union (EMU) after the euro crisis, when this framework is still in transition and under debate. The research has used, and has further developed, the tools and theories of modern economics and finance, as well as of modern legal research, with three aims:

- to gain a better understanding on how economies, with heterogeneous agents, behave and react to policies in times of crisis and recession – with a focus on European economies through the euro crisis;
- in light of this enhanced understanding, to reassess the current EMU framework and existing proposals for reform – in particular, the *Presidents' Reports* and European Commission proposals; and
- to come up with new proposals to strengthen the resilience and competitiveness of the EMU which can be implemented with consensus in the current heterogeneous euro area.

The first aim required covering a large number of related topics, including sovereign debt crisis, risk-sharing and economic stabilisation policies, fiscal stimulus and consolidation policies, fiscal multipliers, optimal tax policies in the global and automated economies, financial stability, and macroprudential and unconventional monetary policies. The second implied focusing on the financial and economic stability of the euro area; in particular, the incomplete Banking Union and the not yet fully functioning Economic and Fiscal Union. The third aim resulted in two new proposals to strengthen the EMU's risk-sharing and economic stabilisation capacity: the European Stability Fund (ESF) and a European Unemployment Insurance System (EUIS).

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