Tilburg University

Financial repression and high public debt in Europe

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Financial Repression and High Public Debt in Europe

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Acknowledgements

The concept of financial repression attracted my interest when I was Head of the Fiscal Policies Division of the European Central Bank (ECB) from 2007-2011. The academic literature dealing with the history of financial crises referred to it as one option for managing and reducing high public debt-to-GDP ratios, in particular by suppressing market interest rates, creating a captive investor base and expropriating assets. Many decades ago, several European governments had also applied such a repressive financial strategy inter alia with the aim to ease their budget constraints.

What attracted me the most was how fiscal policy interacted in this respect with money and finance. During the euro area crisis I asked myself: would the European and national authorities again take resort to the tools of financial repression? What are the legal barriers to do so? How could it affect the functioning of the Economic and Monetary Union? From that moment on, I started to collect relevant literature and suggestive evidence of the occurrence of financial repression in Europe, focusing on the eurozone and its member countries. I summarised my initial findings in a paper after I had become Senior Adviser at the ECB in 2012.

Considering the public policy measures taken during the euro area crisis, it appeared that there was much more to (un)cover on the subject and I contacted Lex Hoogduin and Sylvester Eijffinger about my interest in writing a PhD thesis on financial repression and high public debt in Europe. I knew Lex from our times at De Nederlandsche Bank, the European Monetary Institute and the European Central Bank. I had met Sylvester at conferences and during his fellowship at the ECB. They both share a deep knowledge of money and finance, including public finance, and readily accepted to supervise me on the path to my promotion.

I enrolled in the PhD Programme for Professionals at Tilburg University and started with my thesis in November 2013. I was very pleased that this opportunity to combine PhD research with my full-time job existed and am grateful to the Tilburg School of Economics and Management for the support that I received. I also want to express my gratitude to the ECB and my senior management, in particular Massimo Rostagno, for allowing me to make use of the central bank's technical facilities and to make occasional business trips to conferences and workshops where I could present my papers. This support very much facilitated meeting the challenge of preparing a thesis alongside my job.

I commuted every weekend between my home in Bilthoven and my work in Frankfurt am Main and the long trips by train gave me plenty of time to read and reflect on the academic literature dealing with financial repression. Had I realised how much satisfaction my journey into economic research would give me, I would have embarked on it early rather than late in my career.

I am deeply grateful for the advice, comments and encouragement of Lex and Sylvester during our regular lunch meetings in Tilburg or Amsterdam to discuss the progress with my thesis. They offered me an academic perspective on monetary and financial policies and their interaction with public debt, which greatly helped me to focus my mind on the scientific aspects of financial repression. The other

members of the promotion committee (Fabian Amtenbrink, Dirk Bezemer, Jacob de Haan and Harry Huizinga) gave me constructive comments in the final drafting stage and I thank them for going through the whole thesis and their willingness to be my opponents.

Furthermore, I am very glad that Piet Buitelaar and Guido Wolswijk accepted my invitation to assist me during the defense of my thesis. They have been very friendly and supportive colleagues for a long time and taken together they stand for my whole professional career.

During my whole journey into economic science, I have enjoyed the caring and loving support of my wife, Mariet Diepgrond. During the days when I was at home, I spent too many hours with my laptop instead of with her and I sincerely hope that we will have more time to spend together and go out in the future. I also want to express my gratitude for the regular exchanges Mariet and I had with Lydia Kimman and Hans Zwetsloot, who I am lucky to have as my friends. They closely observed my emotions and feelings in connection with the challenge of writing a PhD thesis, helped me to understand them and encouraged me in my personal development.

I enjoyed writing this PhD thesis a lot. I was always motivated to continue the work – although the task that I had set for myself became very burdensome a few times when close relatives fell ill, and even more so, when my mother's health deteriorated and she died after six months and again when my father suddenly passed away almost a year later. My parents have always accepted and supported the decisions I took on my path through life, even when this meant that I would be living far away from their home. I was always welcome and felt their love when returning to see them. I would have been proud to have them with me at my promotion ceremony and it is therefore that I want to honour them by dedicating this study to their memory.

Bilthoven, December 2017.

Contents

1.   Introduction

... the pressing needs of governments to reduce debt roll-over risks and curb rising interest expenditures in light of the substantial debt overhang, combined with an aversion to more explicit restructuring, may lead to a revival of financial repression. Reinhart and Rogoff (2011, p.3)

1.1   A post-crisis legacy of high public debt

The global financial crisis of 2008 has led to a surge in public debt-to-GDP ratios in the advanced economies to levels not seen since the end of the Second World War (see van Riet (ed.), 2010; Abbas et al., 2011; Reinhart and Rogoff, 2011; and Figure 1.1). In addition, many governments have assumed substantial contingent liabilities associated with financial guarantees for fragile banks, weakened firms, over-indebted households and – in the eurozone – to partner countries in distress. Together with the expected rise in ageing-related entitlements this fiscal legacy of the crisis has raised deep concerns about the sustainability of public finances, especially in some euro area countries.

Figure 1.1 – General government financial liabilities of selected OECD countries, 1901-2016 (percentage of GDP)
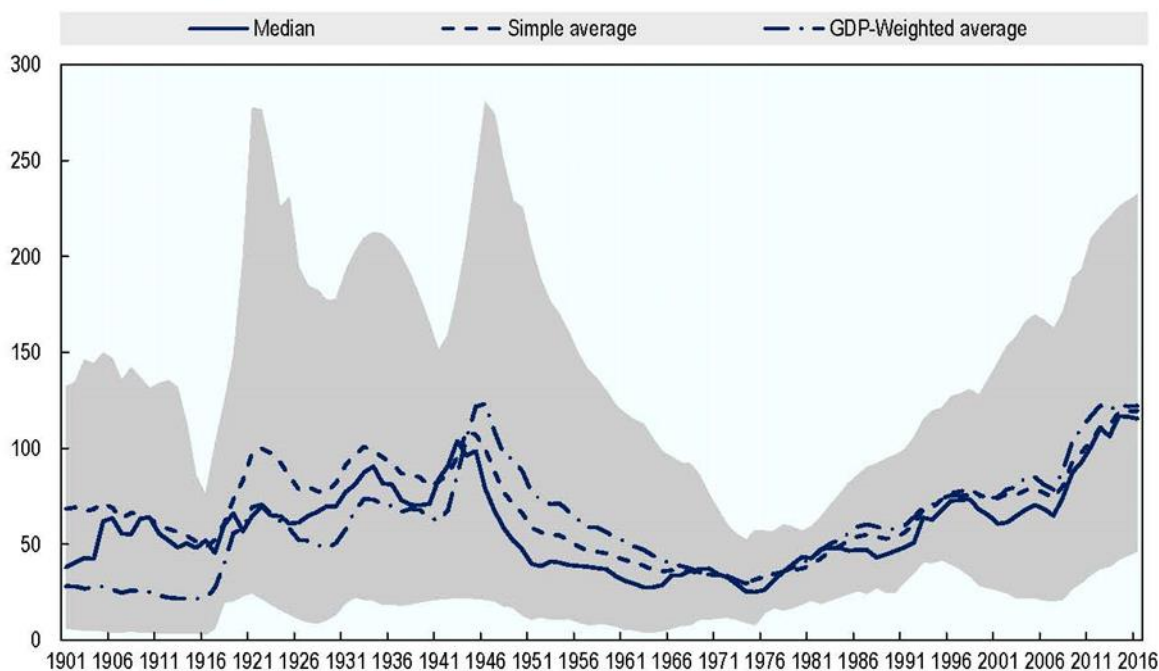
Source: OECD (2016, p.10).

Notes: The chart shows the evolution of several metrics (minimum, maximum, median, mean and GDP-weighted average) of general government gross financial liabilities expressed as a percentage of GDP for a selection of nine OECD countries (Australia, Canada, France, Germany, Italy, Japan, Spain, the United Kingdom and the United States). The grey area shows the range of minimum and maximum values all countries included. Recent data from OECD Economic Outlook No 98 and earlier data estimated by extrapolating the recent data applying the dynamics observed in the gross general government debts as reported in the IMF Historical Public Debt Database. The value for Germany for the year 1925 was dropped as its low value generated an unusual volatility of debt given the pattern for Germany around that period. The remaining gaps in the time series were imputed by fitting piecewise cubic splines. Individual countries' time series may include methodological breaks. The GDP-weighted average ratio from 1954 to 2016 hinges on GDP values from IMF International Financial Statistics, converted in USD using annual exchange rates. GDP-weights before 1954 are identical to values in 1954. Sources: OECD Economic Outlook No. 98; IMF Historical Public Debt, International Financial Statistics and World Economic Outlook databases; and OECD staff calculations.

While fiscal adjustment has made progress, a number of advanced economies still face the triple challenge of maintaining access to sovereign debt markets at affordable interest rates, cutting back their public debt overhang and reducing their heightened fiscal vulnerability to adverse shocks (IMF, 2013). Moreover, in many countries, the private sector is also highly indebted and engaged in a drawn-out deleveraging process, which negatively interacts with excessive public debt levels in dragging down long-term economic growth (Jordà et al., 2016).

As the history of financial crashes indicates, private sector leveraging facilitating public sector deleveraging is less likely in the aftermath of a major financial crisis like that of 2008 (Reinhart and Rogoff, 2009). A credit-less recovery is a more plausible expectation, because undercapitalised banks with many non-performing loans are forced to repair their balance sheets and households and non-financial corporations with a high debt burden will focus on reducing their outstanding debt rather than taking on new credit. As many advanced economies are in the same predicament and are inclined to take protectionist measures, countries also cannot rely on strong net external demand to fuel output growth. Assuming a prolonged period of sluggish output growth and very low inflation, i.e. of secular stagnation, fiscal authorities face an uphill battle in regaining control over public finances.

This challenging environment raises the question of how the advanced economies might overcome the burden of excessive government debt that in itself constitutes a barrier to long-term economic growth and seriously limits the fiscal space for responding to the next recession. In several European countries the financial crisis not only undermined output growth but also developed into a sovereign debt crisis that in turn threatened the very existence of the euro. Restoring public debt sustainability is therefore particularly urgent for Europe. Reinhart and Rogoff (2011, p.3) foresee that governments in many advanced economies will take resort to age-old financial repression in order to address the funding challenges associated with their substantial debt overhang. They define financial repression as a "more subtle form of debt restructuring" that directs private funds to the government by placing explicit or implicit caps on interest rates and creating privileged access to domestic audiences.

1.2   A new era of financial repression?

Many advanced economies resolved the overhang of public debt that arose during the First World War and the Great Depression of the 1930s with suppressed interest rates and monetary financing of budget deficits as well as through capital levies, debt conversion, debt restructuring and outright default (see Makinen and Woodward, 1990, and Figures 1.1 and 1.2). After the Second World War, when public debt-to-GDP ratios were again very high, many governments continued their practice of capping interest rates while accommodating inflation, building on the financial restrictions and capital controls that accompanied the fixed but adjustable exchange rate system of Bretton Woods (Reinhart and Sbrancia, 2015). These financial repression techniques offered a "politically correct" alternative for the forcible methods of debt reduction applied during the interwar years (Reinhart and Rogoff, 2011, p.29).

Figure 1.2 – Long-term interest rates of selected OECD countries, 1901-2016

(percent per annum)
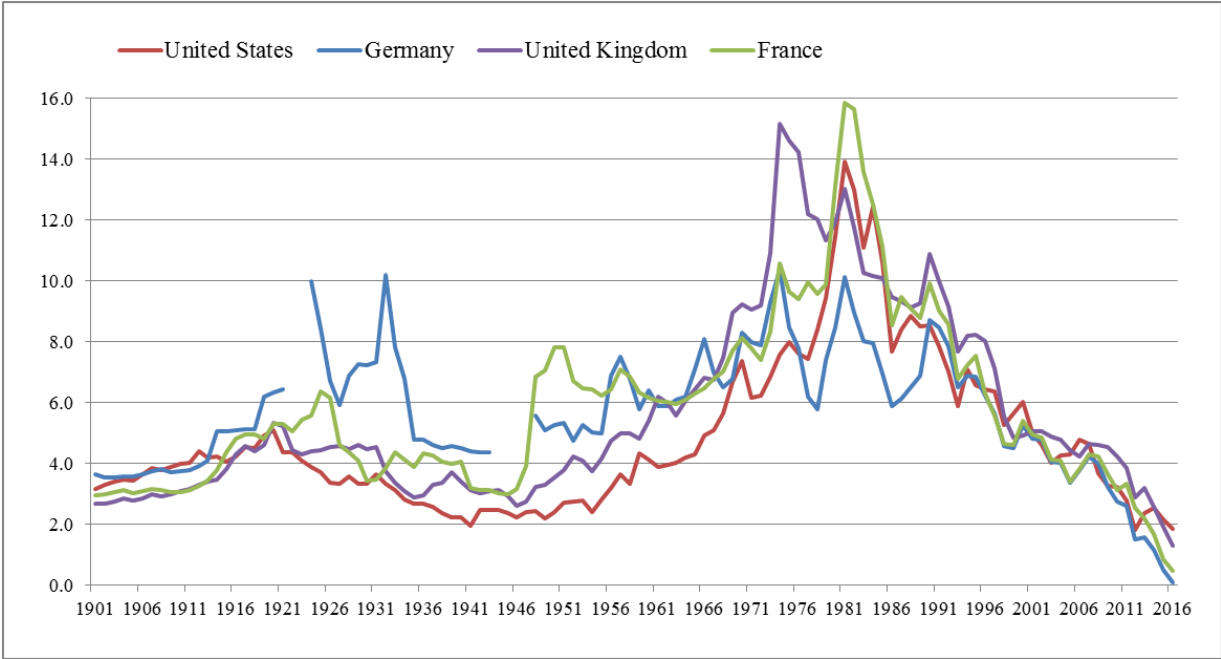
Source: Macro-History Database of Jordà, Schularick and Taylor (2017), completed with a data update for 2014-2016.

The return to sustainable public debt ratios after 1945 was facilitated by the fact that in most advanced economies the central bank was at that time still effectively an arm of the government (Goodhart 2011). This allowed using monetary policy and bank regulation for public debt management purposes, at a time when it was common central-bank practice to apply interest rate ceilings in combination with quantitative controls on money and credit and interventions in domestic asset markets supported by capital account restrictions (see, for example, Chadha et al., 2013). Moreover, the private sector had not had the chance to get indebted during the war, since domestic savings had been channelled with priority to financing the war effort. After the war, public sector financing needs continued to receive preferential treatment compared to private sector credit demand. At the same time, with many central banks administering financial restrictions and capital controls while pegging low interest rates and tolerating inflation, the authorities created scope for credit-driven domestic demand and expanding trade to act as a nominal growth engine for reducing the massive war-related public debt ratios.

Following the seminal work by McKinnon (1973) and Shaw (1973), however, the new paradigm became that financial repression constrains financial intermediation and retards output growth and that financial liberalisation unleashes the financial forces that support economic development. The widespread adoption of this view after the demise of the Bretton Woods exchange rate system underpinned the opening up of international capital markets after the 1970s and the broad-based retreat of governments from direct interventions in the financial sector, other than for prudential reasons. Moreover, they gradually adopted a more supply-side oriented approach to economic policy-making and welcomed the benefits of globalisation.

Since the global financial crisis of 2008, another shift in paradigm is apparent. Attention in the advanced economies returned to the positive contribution that financial restrictions could make to address the overshooting size and inherent instability of the financial sector (Hoogduin, 2013). Taking heart of the lessons of the Great Depression, the fiscal and monetary authorities also felt the need to jointly pursue expansionary demand-management policies to counteract the growing underutilisation of capital and labour. After 2009, most governments turned on a course of fiscal austerity while the major central banks used a combination of conventional and unconventional tools to further relax monetary policy with the aim to achieve a sustained easing of financing conditions. Their unprecedented monetary accommodation over a prolonged period to escape from secular stagnation pushed both short and long-term interest rates down to ultra-low or even negative levels (Figure 1.2). After mid-2014, an increasing amount of sovereign bonds recorded negative market yields, which for the euro area countries, Denmark, Sweden, Switzerland, United Kingdom and Japan peaked in mid-2016 at a value of more than USD 10 trillion (see Figure 1.3).

Figure 1.3 – Outstanding amount of sovereign bonds with negative yields, July 2014-Oct. 2016

(monthly data, nominal amount outstanding in billion USD)
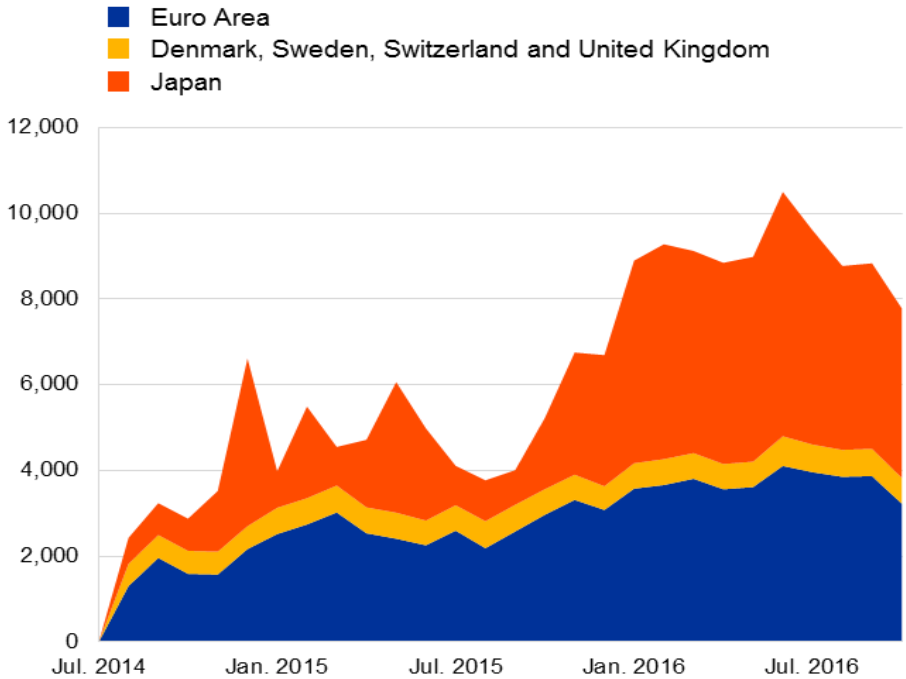
Sources: Dealogic, Bloomberg and ECB (2016).

Some observers have argued that, alongside these public policies motivated by the crisis, the authorities may also have employed techniques of financial repression specifically targeted at easing government budget constraints and managing overstretched public debt levels. For example, Reinhart (2012) presents suggestive evidence that many countries have intervened in financial markets with a fiscal objective in mind, also in Europe. Reinhart and Rogoff (2011, p.35) argue that financial repression could return under the guise of prudential regulation. Van Riet (2013) points to special

budgetary advantages associated with the crisis-related fiscal, financial and monetary interventions in the functioning of euro area credit markets. Activating this 'fiscal insurance' against liquidity and solvency stress could help governments to secure privileged market access at preferential conditions and facilitate public debt management at a time when fiscal sustainability was impaired or uncertain.

For example, in private meetings governments may exercise moral suasion on resident financial institutions to establish funding privileges for the public sector. Financial regulators may offer support by imparting a 'home bias' on supervisory policies or granting public debt a more favourable regulatory treatment than private debt securities by considering sovereign bonds as 'safe' assets by definition. This might be accepted by financial firms in return for supervisory leniency and an (implicit) guarantee that the state will come to their rescue in times of distress. Highly-indebted governments facing liquidity stress could further be expected to exploit interest-rate restrictions and modify taxes and subsidies so as to tilt the allocation of savings towards public sector bonds.

Central banks may be under political pressure to maintain low-for-long interest rates and purchase large quantities of government bonds that are then reinvested over a long period; or they could interpret their mandate and the role of monetary policy as obliging them to assume a fiscal or quasi-fiscal role in order to preserve financial stability and lift the economy out of a secular stagnation (Goodhart, 2012; Buiter, 2014; Summers, 2014). Advanced economies concerned about competitive devaluations in a global context of ultra-easy monetary policies might also feel to have "moral cover for recourse to the use of instruments previously thought inappropriate" (White, 2013, p.80) and apply restrictions on capital outflows, assisting them in establishing a captive domestic investor base for sovereign debt. Countries facing the imminent need to correct a public debt overhang might be tempted to expropriate private assets or employ forcible debt resolution measures, in the same vein as during the interwar years. Altogether, putting a financial repression strategy in the place of fiscal reforms could undermine confidence in the government as a trustworthy borrower, the credibility of public sector institutions and the reliability of the country's legal system of contract rights.

The hypothesis examined in this study is that employing the tools of financial repression has become part and parcel of a widely supported public policy response to the fallout from the crisis in Europe. As in earlier episodes, financial repression could be expected to make a substantial contribution to public debt reduction in the form of exceptional public policy interventions with the official aim to secure or restore a proper allocation of capital, a stable economy and a fair distribution of the crisis-related costs. Curtailing financial markets could support the liquidity of sovereign bond markets and prevent vulnerable countries from being pushed into a self-fulfilling default; while if needed, bailing in private savers and investors could resolve a public debt overhang.

The new-found policy activism of steering the flow of funds reflects that in advanced economies the state is often perceived as a benevolent social planner who will use its coercive powers in the national interest, in particular to ensure the proper functioning of financial markets. Yet, the acceptance of a wide range of non-standard fiscal, financial and monetary tools for managing the crisis also indicates

that policymakers are stretching their mandates to provide substantial short-run debt relief not only for households and corporations but also for their own government, while downplaying the potential economic distortions, financial risks and distributional costs in the longer run. The exceptional fiscal, financial and monetary policy interventions with the aim to ensure attractive private and public credit conditions may in fact enable economic agents to engage in excessive risk-taking and set off a new boom/bust cycle in the economy (Hoffmann and Schnabl, 2016). Political forces may also be exploiting the state as an agent for the special interests of the ruling government as well as its supporters (Haber and Perotti, 2008).

Looking ahead, Goodhart (2011, pp.153-154) foresees some return to "more intrusive regulation, greater government involvement and less reliance on market mechanisms". In addition, "the idea of the central bank as an independent *institution* will be put aside" to allow for close interaction with the government, especially if it were to face severe constraints on fiscal policy or to reach the brink of default (Goodhart, 2012). His observation implies a possible return to the times of fiscal dominance over financial and monetary policies. Although most central bank governors, asked in a survey, saw little if any threat to their political independence (Blinder et al., 2017), the broad scope of exceptional financial market interventions seen in Europe over the past 10 years may well represent the 'new normal' and could signal a new "age of financial repression" (Eijffinger and Mujagic, 2012).

1.3   Objective and outline of this thesis

The main objective of this thesis is to examine whether and to what extent modern financial repression to secure and, if necessary, enforce public debt sustainability has been evident in Europe over the past 10 years. Although the recent academic literature offers some selective information on the subject, a systematic analysis of the rise of financial repression in Europe after the global financial crisis is missing. Yet, the evolving crisis in the Economic and Monetary Union (EMU) – comprising a financial, economic and sovereign debt crisis that culminated in an existential crisis of the euro and deflationary pressures in its aftermath – provides a fruitful ground for studying its prevalence.

This thesis is organised as follows (see Figure 1.4 for an overview). Chapter 2 reviews the concept of financial repression, which in general terms can be characterised as a (sometimes hidden) form of pervasive state interventions in the flow of funds and the stock of debt using discretionary instruments in a rather unpredictable manner, distinct from transparent financial market regulation and rule-based monetary and fiscal policies. This chapter also addresses the question of what could be the primary motivation behind such far-reaching state interventions in the financial system which for some authors amount to financial repression whereas others consider them to be part of public policymaking in the interest of society or welfare-enhancing regulation. Considering the challenges that many euro area countries faced in view of the sharp rise in public debt relative to GDP, this study defines the concept of financial repression more narrowly as the government's strategy – supported by monetary and financial policies – to gain privileged access to capital markets at preferential credit conditions and divert resources to the state with the aim to secure and, if necessary, enforce public debt sustainability.

Figure 1.4 – Financial repression to sustain high public debt: organisation of this study

Chapter 2: financial repression introduction

Chapter 3: channels of financial repression

Chapter 4: public debt management

Sustainable public debt in EMU

Chapter 5: financial system regulation

Chapter 6: monetary policy

Chapter 7: empirics

Chapter 8: conclusions
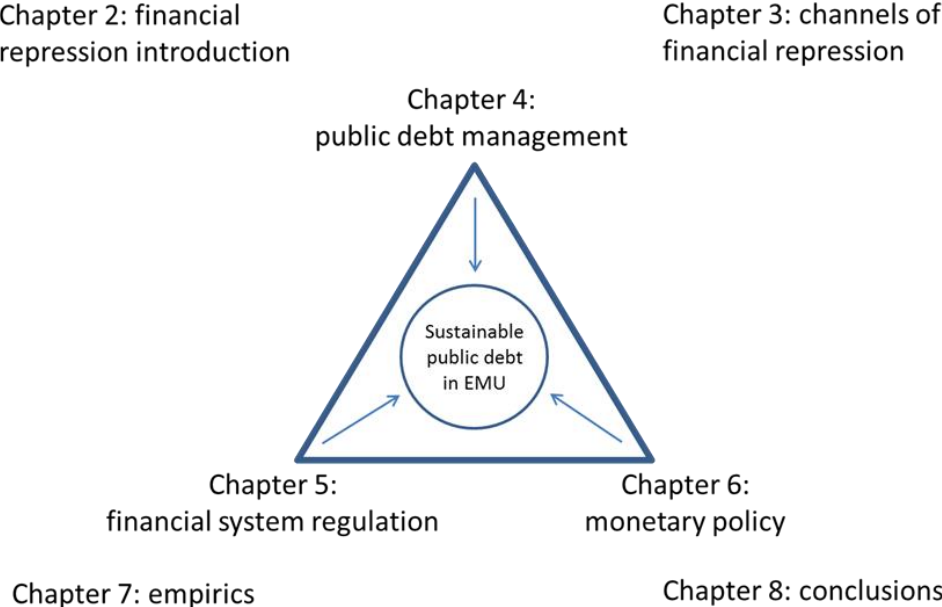
After the global financial crisis, the question of how to manage and reduce high public debt ratios has gained new prominence. Chapter 3 reviews the main standard and non-standard techniques to secure sustainable public finances, both in terms of preserving market liquidity and state solvency. This overview sheds light on the discretionary tools of financial repression that governments (might) apply again in modern times in order to reduce the burden of high public debt rather than a systematic strategy of fiscal consolidation and growth-enhancing structural reforms. The unconventional techniques of public debt control include inter alia attempts to create a captive domestic investor base, expand government funding privileges in financial law, push the central bank into exceptional monetary easing and deficit financing, and eventually to expropriate assets to resolve a debt overhang.

The remainder of this study explores the evidence for the use of financial repression as a fiscal insurance against liquidity and solvency stress in the context of the evolving euro area crisis. Chapter 4 asks the question of how euro area countries, notably those that were hit by the sovereign debt crisis, have used both standard and non-standard public debt management techniques to deflect the severe capital market pressure. Apart from making the supply of government debt securities more attractive to domestic as well as foreign investors, the analysis points to clear cases of steering the home demand for government bonds. The argument put forward is that in particular (but not only) distressed euro area sovereigns tried to exploit captive domestic investors to restore their fiscal sustainability.

Chapter 5 studies in detail the reform of European finance and the launch of EMU crisis management with the prudential aim to make the financial system and the monetary union more resilient and stable. European Union (EU) legislation treats public debt very favourably relative to debt securities issued by the private sector, accepting without questioning its safety and liquidity. This preferential treatment of sovereigns has been extended into a range of EU prudential laws across the financial sector. A new

composite index of these government funding privileges, constructed for the purpose of this study, shows a rising trend over time, indicating the growing scope of the preferential regulatory treatment of (in particular euro area) governments at the EU supranational level. In addition, euro area countries facing liquidity strains may apply for conditional official assistance and ECB protection to counteract disruptive market forces that threaten financial stability and an even monetary transmission in the euro area as a whole. Furthermore, new crisis resolution procedures seek to address an unbearable public debt overhang and prevent that taxpayers are again overburdened with the rescue of failing banks.

As noted above, the secular decline in both short and long-term interest rates gained pace after the 2008 financial crisis. Chapter 6 reviews the academic debate whether central banks have simply tried to keep up with a declining equilibrium interest rate in a context of secular stagnation; or whether a monetary policy bias towards suppressing market interest rates was one of the determining factors and contributed to boom/bust cycles. The central bank practice of pegging the short-term interest rate was followed by a new style of monetary policy consisting of managing the yield curve with the help of large-scale public and private sector asset purchases, which is reminiscent of old-style financial repression of savers for the benefit of governments. A more detailed analysis of ECB monetary policy from the start of EMU until end-2016, distinguishes three episodes: the pre-crisis build-up of economic and financial imbalances, the euro area crisis years, and the time of deflation pressures.

Chapter 7 offers an initial econometric analysis of the channels through which the foregoing monetary, financial and public debt management policies contributed to the steadily declining interest burden of euro area governments. The theory and empirics can identify the individual role of these public policies but not distinguish between secular stagnation and financial repression as a determinant of the falling cost of sovereign credit. Although the empirical results are only a first step and must be interpreted with great caution, they are nonetheless suggestive of financial repression playing at least some role in this process, also given the counterintuitive finding that a lower cost of financing went along with a rising public debt-to GDP ratio at the euro area level.

Chapter 8 concludes that since the 2008 global financial crisis, the sustainability of public debt has been a severe constraint on fiscal policies in several euro area countries. This thesis shows that national public debt management, EU financial regulation, EMU crisis management as well as ECB monetary policy have significantly supported euro area governments in dealing with their fiscal predicament. Taken on their own, these public policy measures were targeted at supporting fiscal, financial and monetary stability in the wake of the euro area crisis. At the same time, the argument can be made that the respective authorities have in fact extensively applied the tools of financial repression and thereby contributed to relieving sovereign liquidity and solvency stress. Past experience suggests that low-for-long interest rates promote moral hazard on the part of both public and private actors, stimulate non-profitable projects and will again lay the foundations for unsustainable output growth and an unavoidable correction in the future.

References to the literature are collected at the end of each chapter.

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2.   Financial repression: concept and motivation

Governments have long intervened in the financial sector to preserve financial stability and protect the public from unexpected losses, but also to limit concentrations of wealth and monopoly power, to generate fiscal resources, and to channel resources towards favoured groups through the financial system rather than the more transparent instrument of public finances. Caprio et al. (2001, p.4)

2.1   Introduction

The term 'financial repression' was coined by McKinnon (1973) and Shaw (1973), building on the analysis by Goldsmith (1969). They studied how developing countries with incomplete capital markets 'repressed' their financial system in order to turn their banking sector into the official market place where scarce capital was intermediated between savers and investors. This enabled the authorities to extract savings from households at suppressed (real) deposit rates and to allocate credit to selected borrowers, including the public sector, at preferential, non-market terms and conditions. Since these state interventions were targeted at both the asset side and the liability side of bank balance sheets, they have also been referred to as 'double financial repression' (see Government of India, 2015).

Financial repression also has a long history in advanced economies with more developed capital markets. The authorities had introduced first prudential policies after World War I with the aim to better control the operation of the financial system and to prevent recurring banking crises. To be effective, governments stepped up their control over financial intermediation through stronger ties with domestic banks, other financial institutions and, in particular, the central bank. Many of them used their dominant position in money and finance to impose below-market deposit and lending rates while instructing the central bank to accommodate rising inflation and provide monetary financing to the state. Several industrialised countries also took 'extraordinary' measures to relieve themselves of the large public debt overhang which they had accumulated during the First World War, the Great Depression, and again during the Second World War (see, for example, Alesina, 1988; Reinhart and Rogoff, 2011).

To further define the concept of financial repression, Section 2.2 lists the seven most important dimensions that characterise where a financial repression regime differs from a liberalised financial system. At the same time, the question must be answered what motivates governments to enter into a financial repression regime. Section 2.3 distinguishes two main strands in the literature including two counterpoints that offer alternative motivations:

1. the public policy view, which considers that 'optimal' financial repression can correct market failures in credit provision and is therefore in the public interest;
2. the public finance view, which focuses on how a 'financial repression tax' can generate alternative state revenues that improve public debt sustainability and enable the government to fulfil its tasks in the public interest;

3. the Austrian economic view, which draws attention to the misallocation of resources arising from misguided state and central bank interventions in free market processes; and

4. the political economy view, which stresses that public policies are often exploited to channel economic rents to privileged groups, serving in particular the special interests of the ruling government as well as favoured political constituencies.

2.2 Seven dimensions of financial repression

Williamson and Mahar (1998, p.2) give a clear characterisation of where financial repression differs from financial liberalisation: the distinction between the two positions lies in who determines who gives credit, who gets credit, at what price, under what market conditions, and – one may add – how a debt overhang is dealt with. Accordingly, in a repressed financial system the government controls both the credit intermediation and debt resolution process using purely *discretionary* measures, creating market uncertainty, while in a liberalised financial system these credit and debt resolution decisions are left to free market forces subject to *objective* prudential criteria on which private agents can base their expectations of government actions. Beim and Calomiris (2001, p.xi) define financial repression in this context as "a form of state domination of the financial process".

The governance of a financial repression regime comprises a cluster of public sector policies to steer both the domestic and the international flow of funds in the economy, address non-performing loans and ultimately claim private assets in 'extraordinary' circumstances (cf. Pastor and Wise, 2014). Apart from 'soft' state interventions to influence behaviour, such as nudging, moral suasion[1] and political pressure, it covers all kinds of 'hard' financial policies such as administrative controls, laws, regulations, taxes, and qualitative and quantitative restrictions that the state uses to manage demand, supply and price conditions in financial markets, or affect property rights, with a heavy hand.

Considering the supportive role of public institutions, in a pervasive repressive regime the government gives instructions to the central bank and (other) regulatory and supervisory authorities, obliging them to put the conduct of monetary, exchange rate, capital account, prudential, regulatory, collateral and bankruptcy policies at the service of politicians. While the government steers the flow of funds in the economy and, if needed, claims private property, in return it promises to stabilise the financial system in case of a systemic crisis (Toniolo and White, 2015).

More concretely, financial repression can be characterised by seven dimensions and seven associated sets of instruments (see Table 2.1, columns 1 and 2) that allow the government to exercise political control over all aspects of the credit intermediation and debt resolution process, supported by cooperative monetary and financial authorities (for a similar but less comprehensive list see Williamson and Mahar, 1998, p.2; and Beim and Calomiris, 2001, p.47).

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[1] Romans (1966) defines moral suasion as the attempt of governments to coerce private agents to undertake unprofitable actions they would not undertake otherwise and in directions not already defined or dictated by existing statute law.

Table 2.1 – Seven dimensions of financial repression and two public interests

The government determines:	The credit intermediation and debt resolution process	Public policy view - the state secures:	Public finance view - the state enjoys:
Who grants credit	*Banking controls* Market-entry barriers State-owned banks Moral suasion Conduct constraints Micromanaging banks	*Low competition*	*Market control*
Who gets credit (and how much)	*Credit controls* Liquidity ratios Credit ceilings Credit rationing Directed credit Collateral rules Portfolio requirements	*Access to credit*	*Privileged credit*
The price of credit	*Interest rate controls* Deposit rate ceilings Subsidised lending rates Preferential conditions Cap on sovereign rates	*Concessional credit conditions*	*Preferential credit conditions*
The seigniorage	*Monetary base control* Reserve requirements Open-market operations Monetary financing Inflation tax	*Desired inflation*	*Public revenues*
The tax regime	*Taxation of finance* Bank levies/subsidies Financial sector taxes	*Limits on finance*	*Public revenues*
The cross-border flow of capital	*Capital controls* Foreign exchange regulation Capital account controls	*Access to capital*	*Captive capital*
The extraordinary debt measures	*Dealing with debt overhang* Supervisory forbearance Interest rate concessions Maturity extensions Grace periods Capital levies Asset expropriation Debt conversion Debt default/repudiation	*Manageable debt*	*Declining debt*

The government of a financial repression regime typically controls credit markets in a comprehensive manner and according to Roubini and Sala-i-Martin (1995, p.279) prevents financial intermediaries from operating at their full potential. A strong presence of state-owned banks further directs the flow of capital to priority sectors. The number of commercial bank charters is restricted to restrain competition. This secures a certain profit margin for uncompetitive banks in return for which they accept detailed controls on their operations. Tight regulation prevents the development of non-bank markets and capital outflows which pushes savers to deposit their money in banks, even though these only offer administratively fixed, low interest rates relative to inflation.

These (scarce) savings constitute a cheap source of funding for bank credit as well as a source of seigniorage from the high (unremunerated) reserves that the central bank requires against these deposits. A range of credit controls function to ration the relatively short supply of bank credit, sometimes under the guidance of a credit commission dominated by public officials. Although this would drive up the price of credit in a free market, interest rate ceilings ensure subsided bank lending rates for preferred borrowers, who as a consequence will also put their money in capital projects with a below-market expected return. To deal with non-performing loans, the state may force banks to roll them over with more concessional terms and conditions while urging forbearance from supervisors.

This political dominance over finance also serves to ease the government's own budget constraint when the central bank imposes a cap on sovereign bond yields and high (unremunerated) reserve requirements on banks or when the sovereign enjoys preferential access to credit from financial institutions and monetary financing. Moreover, the government may tax the extraordinary economic rents that it creates in the protected financial and other strategic sectors to fill its coffers. The too low interest rates and easy access to credit for both public and private borrowers will likely fuel unsustainable economic, financial and fiscal imbalances. Once they have to be resolved, the state may exceptionally take resort to capital levies, asset expropriation, debt conversion and outright default to remove its own debt overhang or that of public corporations in order to deflect a fiscal crisis.

2.3   The primary motivation for financial repression

The term 'financial repression' has a distinctly negative connotation – as intended by the two academic fathers of this concept, given their observation that the many discretionary state interventions in the developing countries that they studied encroached on banks, distorted credit markets, and redistributed income and wealth outside the market process.[2] McKinnon and Shaw were of the view that a financial repression strategy seriously retarded economic development, inter alia, because a substantial part of the limited supply of private savings ended up being allocated to low-quality investments and public consumption while the many high-quality projects were rationed.

As a remedy, McKinnon and Shaw advocated that developing countries should allow interest rates to rise to their free market level in order to attract more voluntary savings into an open and competitive banking system where it could be used as a rich source of funding for productive investment. Their analysis proved to be a turning point in the 1970s' debate about the role of the state in finance and supported the liberalisation of the financial sector and the opening of capital markets in emerging market economies (Loizos, 2006). At the same time, it provided arguments in favour of financial liberalisation and the adoption of the efficient markets theory in the industrialised world after the breakdown of the Bretton Woods exchange rate system.

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[2]   McKinnon and Liu (2013) write that McKinnon and Shaw in 1973 looked for a "pejorative term" akin to political repression. They argue that a modern form of financial repression focuses on how public policies steer 'market' interest rates towards zero, which threatens the viability of financial intermediaries (banks, money market mutual funds, pension funds) in an insidious manner, even without inflation and burdensome distortions in bank regulation.

Financial repression has nevertheless been an ever-present factor in public policymaking, appearing in various manifestations, albeit with different intensity across time and between countries. A striking fact arising from a review of the academic literature is that for some authors, state interventions in money and finance amount to financial repression whereas others consider them to be part of public-interest policies or welfare-enhancing regulation. This lack of consensus in the literature no doubt also reflects that the dominant view about the appropriate role of the state in finance has shifted markedly over time. Popular opinion in this regard changed fundamentally after devastating shocks such as the First World War and the Great Depression of the 1930s and it appears again to have been affected by the global financial crisis of 2008 (on these 'great reversals' see Rajan and Zingales, 2003; Battilossi and Reis 2010; Perotti, 2013; Pastor and Wise, 2014; Harnay and Scialom, 2016).

Looking for an explanation for the prevalence of financial repression regimes, McKinnon (1973, p.6) considers that after their colonial episodes the newly independent states may have felt compelled to use public policies to kick-start their industrial expansion. Under the umbrella of their Western colonial powers they often had relatively easy access to foreign finance, also for funding government deficits, while after their political independence it suddenly became important to mobilise domestic savings for investment purposes. The authorities saw interventions in the allocation of scarce capital as necessary to achieve this objective. As adverse shocks hit them, so Shaw (1973, p.14), requiring a change in relative prices to absorb their impact, they may then have allowed ordinary financial restrictions to slip inadvertently into financial repression in a mistaken effort to uphold growth. For example, the practice of fixing nominal interest rates at a low level could have turned unintentionally into financial repression in episodes of high and rising inflation. This lowered financial prices in real terms and triggered destabilising portfolio shifts from financial into tangible assets as well as from domestic into foreign assets enjoying free market returns (Fry, 1997, p.76).

Opting for a repressive strategy of state interventionism may in other cases have been a deliberate choice of policymakers. As Shaw (1973, p.80) notes: "…the techniques of financial repression [ ] are simple, but numerous, widely known, and widely practised… Ample basis for it is found in doctrine, from the Old Testament and the Koran to the *General Theory* [of Keynes (1936)]". The literature offers two 'public interest' explanations for why the state may choose to intervene in money and finance up to the point of financial repression (cf. Denizer et al., 1998; Yülek, 2017). Each of these two theories also has a counterpart which concentrates on how it serves 'private interests' (Table 2.2).

Table 2.2 – Two views on the main motivation for financial repression and two counter opinions

	Focus on market functioning	**Focus on state functioning**
Serves public interests	1. Public policy view	2. Public finance view
Serves private interests	3. Austrian economic view	4. Political economy view

First, the *public policy view* considers that many governments have intervened in the financial system in order to address market failures in the provision of credit and improve social welfare. Their interventions are described as modest financial restraint instead of pervasive financial repression, following a belief that these measures are required to stimulate output growth, preserve economic and financial stability and support the less privileged in society (see, for example, McKinnon, 1973; Shaw, 1973; Fry, 1982; Honohan and Stiglitz, 2001). These market-supporting interventions (see Table 2.1, column 3) naturally involve the central bank and the regulatory authorities to enable proper state control over the credit intermediation and allocation process for the purpose of fulfilling public policy priorities (see Reinhart and Rogoff, 2011; Toniolo and White, 2015; Monnet, 2016). Designed as industrial policy, 'mild' financial repression opens the door for directing scarce capital at low cost to selected industries, sectors or regions with a strong growth potential, such as export firms and trading companies (see Yülek, 2017). Moreover, it gives the government a range of tools to smooth the business cycle, generate the desired rate of inflation, and to steer financial developments. Furthermore, it offers the opportunity to address social and equity concerns, for example by providing credit to underprovided parts of the economy or mortgage guarantees to support home ownership.

Second, the *public finance view* sees the direct and indirect benefits to the government budget, the sustainability of public finances and, hence, the functioning of the state as the predominant rationale of financial repression (see, for example, Giovannini and de Melo, 1993; Fry, 1997). Looking to avoid the political costs of cutting public spending and the distortionary costs of high marginal income taxes for debt repayment, governments opted for financial repression, because "savers are captive taxpayers" (Shaw, 1973, p.162), i.e. they represent a source of "easy revenue" for the public budget and "implicit subsidization" of the public sector (Roubini and Sala-i-Martin, 1992, pp.6-8), especially in an inflationary environment. From this viewpoint, the controls placed on the financial and monetary system result in below-market nominal and real interest rates and are equivalent to a "tax on bondholders and savers" (Reinhart and Sbrancia, 2015) or a "tax from controls" (Bruni et al., 1989) that through various channels directs resources from savers and bondholders to the public sector without having to raise (optimal) tax rates and having to ask the parliament for approval. The "financial repression tax" (Reinhart and Sbrancia, 2015) will inevitably lead to capital flight. The government will have to counter this form of tax evasion by restricting capital from moving abroad (cf. Giovannini, 1988). Taken together, financial repression gives the government extra budgetary leeway while securing a sustainable public debt-to-GDP ratio (see Table 2.1, column 4). At the same time, the dominant position of the state as the largest borrower in a domestic capital market subject to pervasive restrictions has the effect of crowding out private creditors.

The third motivation for financial repression can be related to the *Austrian economic view* of the state as an actor that tends to suppress the free functioning of markets (see, in particular, Mises, 1949; Hayek, 1931). The unavoidable consequence of steering the flow of funds through fiscal, monetary and prudential policies is a distortion of market-based incentives to save and invest. The state exploits its monopoly on the issuance of money, as well as its regulatory powers and a subservient central bank

to push the nominal and real cost of domestic credit below the level that the market itself is willing to offer. The main objective is to increase the circulation of money and thereby its own seigniorage income (see the tools mentioned under the price of credit in Table 2.1). Or when the central bank is independent in the conduct of monetary policy, it may be following misguided theories about macroeconomic stabilisation and crisis management, leading to a downward bias in interest rates because it believes that easing private credit conditions is the best way to ensure full employment and price stability (Schnabl, 2016). The suppression of interest rates will in that case also inadvertently contribute to funding the government's budget deficit on favourable terms. Since below-market sovereign bond yields set the standard for the cost of private credit, they also serve the special interests of a profit-maximising banking sector that is keen to offer a growing amount of cheap loans to expand its business. The ample availability of low-cost credit will fund inefficient investment projects that result in an excess accumulation of unproductive capital and asset price bubbles. The initial gains for the government of distorting saving and capital allocation decisions will eventually disappear as the productivity of capital suffers and an artificial economic and financial boom turns to bust.

Fourth, the *political economy view* stresses the importance of rent-seeking behaviour to understand the nature of financial policies (see Tullock, 1993; Pagano and Volpin, 2001; Haber and Perotti, 2008). This view assumes that as a result of political failures both public officials and private agents may be able to exploit the regulatory and repressive powers of the state – including those of the central bank and the financial supervisor – to create and capture economic rents (using any of the instruments listed in Table 2.1). Their relative political influence will determine which special interest group will be the most successful in this power play and accrue most of the financial repression revenues. Or they may decide to establish special relationships and join forces to extract and share these non-market revenues from state capture (cf. Calomiris and Haber, 2014; Monnet et al., 2014; Zingales, 2015). Accordingly, the discretionary nature, scope and duration of financial repression will reflect the degree of political capture of state interventions in finance and/or the political clout of private beneficiaries that hope to enjoy from cheap credit alongside the government.

Overall, the two main views of financial repression and their two counterparts focus on how the government uses its enforcement powers to determine who gives credit, who gets credit, at what price and other conditions, and how a debt overhang is resolved, beyond the free operation of the market. The motivation for repressing the financial sector in the public finance view is that the government looks for discretionary ways to finance its own budget at preferential conditions and to secure a sustainable, declining public debt ratio. However, this privileged access to capital reduces the availability of credit for the rest of the economy, with the side-effect of drawing the government also into the business of allocating credit among competing private users while imposing capital outflow controls. According to Denizer et al. (1998), the additional government role of allocating scarce private credit is unintended and that is what distinguishes the public finance view from the public policy view, which instead considers the distribution of credit to selected parts of the economy as the primary reason for imposing financial restraints for the common good. The Austrian School, instead,

regards this enhanced role as typical of a state that impinges on free market forces, pointing out that the artificially low cost of domestic credit will lead to recurring boom-bust cycles. The political economy view assumes that well-intended financial policies may be high-jacked by politicians or coalitions of rent-seeking special interest groups. Their main motivation for financial repression is above all to extract rents for powerful political factions, which may also be shared with private partners in an opaque manner.

Menaldo (2016) combines the main elements of these explanations for financial repression in the context of developing countries with a low state capacity to secure sufficient tax revenues. This author argues that the rulers of a weak state have a "fiscal imperative" to politicise finance. The need for an alternative source of public revenues drives them to use their coercive powers to establish a concentrated financial sector through which credit is rationed and abnormal profits are generated both for protected banks and privileged firms that can be taxed to finance the government. By imposing a low cost of credit, the state also ensures cheap public and private debt financing. The fiscal requirements of a weak state are therefore the main motivation for creating a coalition of rent-seeking interest groups that benefit from and uphold a repressed financial system.

Given the focus on Europe in this thesis, Menaldo's (2016) concept of a weak state may be interpreted as a Member State's vulnerability to a 'debt run' in a fiscal crisis, especially after it has given up its monetary sovereignty as part of joining the Economic and Monetary Union (EMU). With the fiscal policy challenges in mind related to the sharp rise in public debt relative to GDP in the euro area countries, *financial repression for the purpose of this thesis is defined as the government's strategy – supported by monetary and financial policies – to gain privileged access to capital markets at preferential credit conditions and divert resources to the state with the aim to secure and, if necessary, enforce public debt sustainability.* Chapter 3 therefore takes a closer look at the main fiscal and quasi-fiscal instruments of financial repression.

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3. Techniques of financial repression to secure the sustainability of public debt

Financial repression occurs when governments implement policies to channel to themselves funds that in a deregulated market environment would go elsewhere. Reinhart et al. (2011, p.22)

3.1 Introduction

Financial repression has in the past often served as an instrument for governments to collect revenues from the financial and monetary system in order to ease their budget constraint. Governments typically applied financial repression techniques as part of a public debt management strategy through which they enforced debt sustainability (Alesina, 1988; Aloy et al., 2014; Reinhart and Sbrancia, 2015). The corresponding interventions served three fiscal purposes:

1. to allocate financial resources to the public sector for funding its deficit,
2. to stabilise public debt-to-GDP by ensuring liquidity and solvency, and if needed,
3. to redistribute income and wealth towards the government through forcible measures.

The financial repression tax included, for example, seigniorage income from the inflation tax on real money balances (associated with policies promoting households to hold money while accommodating higher inflation), interest savings from a cap placed on sovereign bond yields (with the central bank as the enforcer), an implicit or explicit tax imposed on the financial and monetary system (such as high and unremunerated reserve requirements for banks, a favourable regulatory treatment of sovereign bonds and forced investment in government debt at below-market rates), or a confiscation of private wealth (via a one-off capital levy, expropriation of assets, or outright sovereign default) which is equivalent to a lump-sum tax (cf. Shaw, 1973, p.152).

The degree of success of financial repression with a fiscal motivation is determined by the proportion of funds that is transferred from the financial and monetary system to the public sector (Fry 1997, p.74). The revenues from the repression tax may subsequently be redistributed to political elites or favoured (state) enterprises in return for particular services and benefits. The diversion of income and wealth to the state points to the potential contribution of financial repression to smoothing the tax impact of debt shocks, containing self-fulfilling default expectations, and ultimately in resolving a debt overhang. These fiscal stabilisation properties make financial repression especially attractive for high-debt countries facing liquidity stress and solvency concerns. .

These short-term positive effects notwithstanding, financial repression with a fiscal motivation also entails longer-term negative consequences. For example, a situation of governments managing the financial system so as to secure privileged funding also redirects private savings and investments which could hurt the proper functioning of the economy. Moreover, a pervasive financial repression strategy impairs the ability of financial markets to send disciplinary signals about the soundness of fiscal positions, which fuels moral hazard on the part of sovereigns and promotes a debt bias in financing public spending. Alm and Buckley (1998) therefore caution against drawing strong conclusions from partial analyses of the benefits of financial repression for government revenues.

An unexpected fiscal emergency may temporarily justify some mild forms of financial repression as a fiscal insurance against market stress and capital restrictions may possibly buy time for politicians to adjust their fiscal policies. However, a repressive financial regime that favours governments is unlikely to succeed in putting off fiscal consolidation and fundamental reforms forever. Sooner or later, the negative consequences of postponing fiscal reform and artificially enforcing public debt sustainability will come to the surface. The longer this financial regime lasts and the more pervasive it becomes, the more political controversy will emerge over the economic side-effects, the risks for economic and financial stability and the distributional consequences. The heart of the matter is thus whether a government facing a budget constraint is willing to engage in fiscal reform instead of financial repression and to accept the fiscal policy discipline of a free capital market, also when it involves taking politically difficult tax and spending decisions.

Since the global financial crisis of 2008, sovereign bond market developments in the advanced economies have been heavily affected by fiscal, financial and monetary policies without apparent coordination, leading to a rather confusing overlap of separate public institutions seeking to meet their respective mandates. Public debt managers faced the challenging task of preserving market liquidity and maintaining fiscal solvency, which was a precondition for fiscal policymakers to be able to play a macroeconomic stabilisation role. At the same time, supervisory authorities extended prudential measures that stressed the superior quality of government bonds as high-quality and liquid instruments for regulatory purposes. With monetary policy rates reaching the zero (or effective) lower bound, central banks on their part returned to operations in sovereign bond markets with the objective to repair broken monetary transmission channels, revive economic activity and prevent deflationary forces from getting hold. As a result, public debt has moved back to centre stage again.

Some observers have argued that the special role assigned to public debt is similar in style to the decades-long episode during which financial repression was employed to fulfil fiscal policy needs. Others respond that these interventions are reflecting how authorities seek to fulfil their respective mandates in an unusual crisis-induced environment. This controversial debate makes it necessary to study the nature of these 'non-standard' public debt operations. Reinhart and Rogoff (2011, p.327) consider that "[t]he phenomenon of financial repression as a mechanism for partially defaulting on government debt is an extremely important topic for future research". These authors consider as especially important the cases "where governments essentially force captive domestic markets to absorb government debt at well below market interest rates" (p.338).

A priori, the revival of financial repression in Europe faces many constraints. Directly managing low nominal interest rates or negative real interest rates is no longer a feasible policy option for euro area governments that wish to reduce their debt burden; they could only lock in the cost advantage of low nominal bond yields by issuing more debt at longer maturity. Ageing societies like the euro area have a strong interest in earning a positive market-based real rate of return on their savings. The highly integrated EU capital market and the free movement of capital also limit the scope of creating low-

interest rate havens. Moreover, the freedom given to financial institutions to decide where they place their money should prevent efforts aimed at establishing a captive investor base.

As discussed in this chapter, these freedoms are protected by the Treaty on the Functioning of the European Union. The EU Treaty also secures the ECB's independence in carrying out its task of maintaining price stability and it bans monetary financing of governments and other public bodies. The EU fiscal rules further require Member States to prevent excessive budget deficits and too high public debt ratios that might otherwise make financial repression to ease the debt servicing burden an attractive alternative policy option. EU institutions and Member States are also not allowed to take over the financial liabilities of a distressed partner country. All these legal provisions are meant to subject governments to market discipline when they issue debt.

However, financial repression could still reappear on a large scale under exceptional circumstances and exercise an important longer-term influence over sovereign bond markets. As it turns out, there are several 'loopholes' in the EU Treaty which allow the European authorities to do "whatever it takes" with the aim of safeguarding financial and monetary stability. These supranational public policy measures, seen in economic terms, create government funding privileges and ease public sector budget constraints, contrary to the EU Treaty's basic philosophy of subjecting Member States to market-based fiscal discipline. Moreover, when adopting the euro, the participating countries kept their national sovereignty over fiscal and financial matters. National policymakers thus retained considerable room for manoeuvre within the margins of EU law to introduce domestic coercive measures.

Section 3.2 reviews how since the crisis of 2008 sovereign bond markets in Europe have again become a focal point not just for fiscal policy, but also for monetary and financial policies, albeit each from their own perspective. Section 3.3 discusses the main liquidity and solvency features of public debt sustainability. Section 3.4 first reviews the standard strategies available to governments to secure their creditworthiness and then examines the various non-standard instruments of financial repression and confiscation which might be employed to relieve liquidity stress and a debt overhang. As it turns out, financial repression is a key element of the heterodox strategies but may also affect the standard debt reduction policies. Section 3.5 asks how modern financial repression establishing funding privileges for euro area governments could fit within the legal constraints imposed by the EU Treaty. Against this background, Section 3.6 defines the framework for the analysis of modern financial repression in the euro area in the remainder of this thesis.

3.2   Public debt back at centre stage

The crisis-related need for euro area governments to finance a much higher and rising level of public debt has motivated a search into economic history with a particular interest in episodes when government debt was at peak-levels and occupied centre stage in public policies. During World War I, the Great Depression, and in particular World War II, the public debt-to-GDP ratios of many advanced economies, also in Europe, reached record-high levels (see Figure 1.1) and in the following years governments had to deal with debt roll-over pressures and the debt servicing burden.

As was common practice, the state controlled the financial system and the flow of funds with a heavy hand, supported by financial repression techniques and capital controls.[3] Many treasuries either operated as a dominant player in securities markets with a controlling influence on interest rates, or they instructed their central bank to influence price formation through open-market operations both as a way to stabilise the business cycle and to ensure cheap funding for the state. In addition, the central bank and/or regulators nudged the financial community in lending with priority and on preferential terms to the state, whereby some central banks had to provide monetary financing of budget deficits when investor demand was low. As part of industrial policies, cheap credit was also directed to public enterprises and strategic sectors, including through nationalised or state-controlled banks, while rationing credit for other parts of the economy. Some advanced economics also discussed or applied repressive measures to enforce a reduction of their public debt overhang, including through a one-off capital levy, a forcible conversion of short-term into long-term debt, or a default (IMF, 2012).

Overall, financial repression served as an important instrument for achieving public policy objectives. According to Kelber and Monnet (2014, p.154), the boundaries between fiscal, monetary, prudential and industrial policies were deliberately left unclear in order to hide the fact that for many interventions the government was the intended beneficiary of these market-distorting repressive measures. As noted by Masciandaro and Quintyn (2013, p.271), all public policy domains were narrowly intertwined and de facto served to undertake quasi-fiscal activities.

After the breakdown of Bretton-Woods in 1971 and the stagflation experience of the 1970s, the practice of mixing macroeconomic policies, prudential interventions and social objectives with fiscal protectionism was no longer tenable and in the following three decades capital movements were liberalised and financial markets deregulated (Bakker and Chapple, 2002). Governments, central banks and regulators gradually adopted the hypothesis of efficient capital markets. This view had far-reaching consequences for fiscal, monetary and prudential policies. The governments of advanced economies accepted – up to a point – that they had to finance their budget deficits by competing for funds in international securities markets where prices are determined by demand and supply conditions rather than financial repression.

Many public debt management offices (which hitherto had been located inside treasuries or central banks) received operational autonomy in the 1990s with a mandate to finance the state at the lowest possible cost for the budget and a prudent level of interest-rate and refinancing risk, subject to specific guidelines from the finance ministry (see Wolswijk and de Haan, 2005). They cooperated closely with

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[3] For example, Makinen and Woodward (1990) describe the public debt management challenges in Europe after World War I, Allen (2014) describes monetary policy and financial repression in post-war Britain, Monnet (2014) reviews post-war monetary policy in France, Bruni et al. (1989) and Battilossi (2003) cover financial repression in Italy, Wyplosz (2001) deals in this respect with Belgium, France as well as Italy, de Macedo and Sebastião (1989) report the experience of Portugal and Pagoulatos (2003) reviews the cases of Spain, Portugal and Greece. Denizer et al. (1998) study financial controls in the transition economies of Eastern Europe, some of which later joined the European Union. Yülek (1997) studies financial repression in Japan. On the relationship between the US federal government and the Federal Reserve see Chapter 6, Box 6.1.

primary dealers, a selective group of both domestic and foreign banks, which in return for certain privileges had the task to facilitate the placement of government securities in the market. As a result of this 'financialisation' of public debt management (Fastenrath et al., 2017), their focus shifted away from fulfilling macroeconomic policy objectives to observing microeconomic portfolio considerations. Especially in Europe, their task became to provide the state with a form of insurance against market power (Dyson, 2014, p.381).

Central banks on their part were relieved from their previous duties to assist the state in actively steering macroeconomic and financial outcomes and to manage its debt. The consequence of accepting the efficient markets view was that the monetary authorities moved away from their previous interventionist strategies, which had involved actively changing the supply or maturity structure of sovereign bonds to influence private portfolios and long-term interest rates for macroeconomic policy or financial stability purposes. Sophisticated financial markets allowed central banks to steer money market rates and through market expectations influence the whole yield curve (see for example de Greef et al., 1998; Houben, 2000; Zampolli, 2012; Meaning and Warren, 2015). With an independent mandate, central banks could henceforth focus on maintaining price stability as the primary objective of monetary policy (Eijffinger and de Haan, 1996).

Privileged access of government entities to credit provided by financial institutions was renounced. As financial liberalisation progressed, commercial banks, pension funds, insurance companies and investment firms could freely allocate their assets according to return expectations, subject to supervisory criteria, instead of having to fulfil social motives imposed by the state. Financial regulators followed international agreements on how to stabilise financial institutions in open capital markets. To support the demand for government bonds in competitive capital markets international bodies and national regulators introduced a preferential treatment of financial sector claims on the domestic public sector in micro-prudential legislation (notably in the Basel capital framework for banks). After decades without a sovereign default in advanced economies, government debt was generally regarded as a 'safe' financial instrument (also reflecting the fact that it was thought that the state could always call upon the central bank in case of an emergency). Moreover, given the large supply of government bonds the related securities markets were also relatively liquid.

Since the global financial crisis of 2008 the macroeconomic perspective of public debt has gained prominence again, also in Europe. This has blurred the separation principle between fiscal policy, monetary policy and financial policy. On the one hand, public debt managers continue to target the microeconomic portfolio objective of minimising expected debt-servicing costs for the public sector while maximising fiscal stability. On the other hand, fiscal policy operations, monetary policy interventions and prudential regulations focused again on the role that public debt could play in meeting macroeconomic and financial stability objectives (Hoogduin et al., 2011; Holler, 2013).

Governments required substantial additional bank loans and market funding to finance their crisis management operations as well as their macroeconomic stabilisation activities. Some appear to have

taken resort to moral suasion or outright financial repression of credit institutions and other captive domestic investors to facilitate their public debt management, notably in Europe (see Chapter 4).

Following agreement at the G20 level, state regulators initiated a tightening of prudential legislation, which at least in Europe also extended the existing preferential regulatory treatment of public versus private debt throughout the financial sector. EU governments further enjoyed explicit protection against market pressure, as short-selling of their bonds, buying sovereign default protection and issuing sovereign credit ratings faced new restrictions. New European institutions and the ECB provided liquidity support and stabilisation facilities for distressed sovereigns (see Chapter 5).

Monetary and financial stability arguments led major central banks, including the ECB, to rapidly cut their policy interest rates to low levels and provide ample liquidity to banks, which also helped to reduce the costs of governing borrowing. With policy rates falling close to the zero (or effective) lower bound, the monetary authorities started to expand their balance sheets. Their large-scale purchases of longer-term government debt securities introduced an official market player on the demand side with the credible power to influence capital market conditions, lower sovereign bond yields and flatten the yield curve (see Chapter 6).

The result is a complex mix of autonomous fiscal, regulatory and monetary policymakers affecting sovereign debt markets today, each following their own mandates, without apparent coordination. Public debt management, financial regulation and monetary policy all play an important role in supporting public debt sustainability, an objective which appears to have assumed centre stage again (see Figure 3.1).

Figure 3.1 – Public debt back at centre stage after the global financial crisis

Public debt management
(minimising debt-servicing costs, maximising fiscal stability)

Sustainability of public debt

Financial regulation
(protection from market pressure, preferential treatment of public debt)

Monetary policy
(low policy rates, repair of sovereign bond markets, quantitative easing)
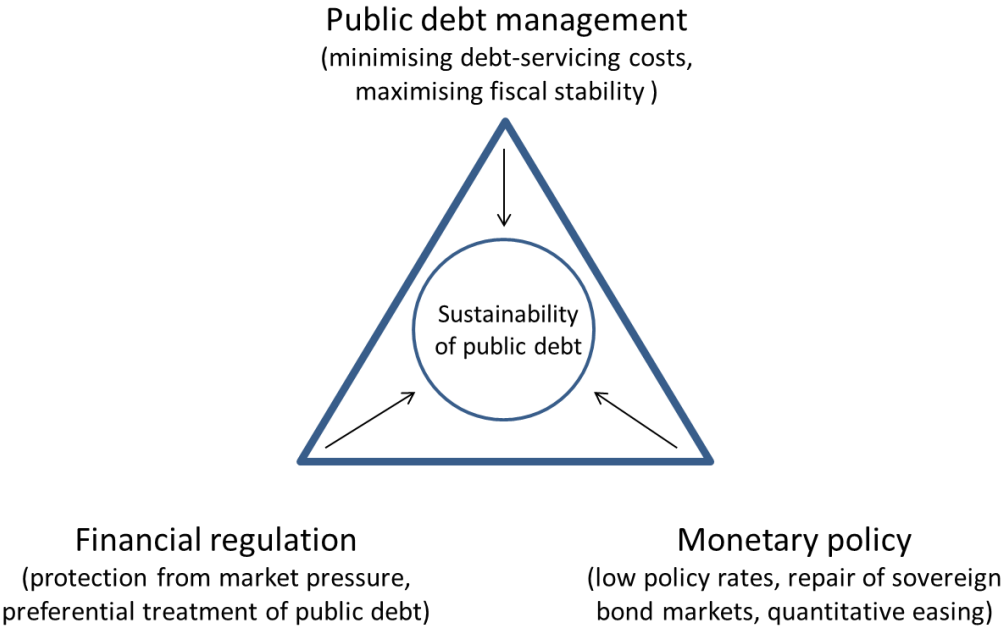
Some observers have argued that this close interaction is reminiscent of the heydays of financial repression after the Great Depression. However, there are at least three key distinctions with the past.

First, during the decades of financial repression the state was always clearly in control of all public institutions, even if its public policy interests were in practice often overtaken by private interests. By contrast, most central banks currently have a relatively independent monetary policy mandate for price stability and national regulators and supervisors pursue financial stability objectives subject to international coordination. This makes it more difficult for governments than in the past to assume control over these public institutions and to make fiscal policy interests dominate their actions.

Second, monetary and regulatory authorities in essence are trying respectively to counter the fall-out from the global financial crisis and correct the supervisory failures that contributed to it. Their interventions are at least officially envisioned to be market-supporting and stability-oriented in nature rather than market-distorting activities that promote moral hazard among sovereigns.

Third, capital markets are nowadays global in nature and old-style financial repression measures would be quickly undermined by capital flight and regulatory arbitrage. The increased 'home bias' that is evident in financial sector investments across OECD countries may just reflect a risk-off response to the crisis. The trend in Europe is also to break the nexus between banks and their sovereigns and to deepen financial integration by harmonising national legislation affecting cross-border access to capital.

Yet, central banks and supervisors also feel political pressure to assist their governments in dealing with high public debt as they were obliged to do in the era of financial repression. Or their crisis management may rest in a monetary policy belief that below-market interest rates will stabilise the economy and the regulatory fiction of zero-risk sovereigns. Governments in any case are benefiting considerably from the unprecedented monetary policy actions taken to ease credit conditions and maintain price stability as well as from further extending the preferential regulatory treatment of government bonds for financial stability purposes. These crisis responses have direct favourable effects in the fiscal domain, such as easy financing conditions and interest rate windfalls for governments, a non-tax reallocation of income from savers to public and private sector borrowers, prolonging the life of fragile banks where governments are reluctant to pull the plug, and establishing pockets of financial protectionism for sovereigns similar to captive government bond markets. All these 'unintended' consequences suggest a need to take a closer look at the channels through which modern financial repression has the potential to support public debt markets and fiscal sustainability.

3.3   Key features of public debt sustainability

A fiscal position is sustainable if the government is able to both finance and service its debt at any point in time. This definition combines both liquidity and solvency requirements for debt sustainability. Generally speaking, a government is liquid if its access to financing is ensured in the short term and solvent if it can meet its obligations in the long term (see the contributions in Neck and

Sturm (eds.), 2008; as well as Giammarioli et al., 2007; ECB, 2011, 2012; IMF, 2013a,b; Bouabdallah et al., 2017). The analysis of fiscal sustainability therefore demands consideration of the level and composition of government debt, the contingent public sector liabilities and the gross (re)financing needs, as these are resulting from the public sector's asset and liability management as well as its policies. Given these constraints, governments apply various tools to manage high public debt and the primary budget deficit in such a way as to achieve a declining debt-to-GDP ratio, relieve the burden from interest payments and limit the risk from having to roll over a large amount of maturing debt in the short run.

The accumulation of government debt over time is determined by the sequence of a government's primary budget balances, the interest payments on outstanding debt, the nominal growth rate of the economy and stock-flow adjustments comprising factors that change the debt without affecting the primary balance (e.g. financial transactions, revaluations, reclassifications and default). Since the state is the beneficial owner of the national central bank, the claim it has on the seigniorage revenues from exploiting the monopoly over money creation (in practice, central bank dividend paid out to the treasury) may be separately distinguished. The standard equation that describes this debt accumulation process is the following:

$$\Delta b_t = \frac{i_t - g_t}{1 + g_t} b_{t-1} - pb_t + s_t + f_t \qquad (3.1)$$

where Δb_t is the change in the government's (gross) debt-to-GDP ratio over the previous period, i_t is the implicit interest rate paid on outstanding debt, g_t is nominal GDP growth, b_{t-1} is the government debt-to-GDP ratio in the previous period, pb_t is the primary balance-to-GDP ratio, s_t stands for seiniorage income relative to GDP, and f_t represents stock-flow adjustments to GDP which comprise inter alia financial transactions that do not directly affect the primary balance.

A key requirement for fiscal sustainability is the ability to avoid an exploding government debt ratio. Achieving this, in turn, requires as a minimum the ability to stabilise the debt-to-GDP ratio over an infinite (or in practice over a foreseeable) horizon ($\Delta b_t=0$). This demands that the primary balance (pb_t) (including seigniorage revenues, s_t) is positive, notably when the implicit interest rate (i_t) exceeds the nominal growth rate of the economy (g_t), while putting stock-flow adjustments (f_t) to zero. When this condition is not fulfilled and the government is unable to meet its rising debt obligations, for example by selling assets, the country is insolvent and must first remove its debt overhang and restore its creditworthiness before it will be able again to draw on private funding.

The rising level of public debt in recent years has greatly increased attention for the analysis of liquidity and solvency aspects that determine the sustainability of public debt. Apart from the level of government debt, also the instrument type, redemption profile and ownership of past bond issues (i.e. the composition of b_{t-1}) matter a lot for debt sustainability, since the choices made in this respect will determine both secondary market liquidity and vulnerability to roll-over risk, rising interest rates and

exchange rate volatility.[4] Countries will be better able to realise a favourable debt structure and a smooth short-term debt (re)financing if they are successful in securing the confidence of market participants in its longer-term creditworthiness, including a low risk from contingent liabilities materialising in the future.

3.3.1 *Liquidity aspects of public debt sustainability*

Looking at the liquidity considerations in more detail, the maturity structure, interest rate fixation, currency denomination and ownership of government debt must be considered when discussing debt sustainability (see Hartwig Lojsch et al., 2011; Missale, 2012). The more a government has financed itself at long rather than short maturities, at fixed rather than variable interest rates and in its own currency rather than in foreign currency, the more protected it is against short-term market volatility in funding costs and the more time it has to adjust fiscal policies in response to a large negative shock. Vice versa, a high share of debt maturing in the short run, subject to variable interest-rate conditions or issued in foreign currency, could create serious roll-over difficulties and higher funding costs if the market sentiment suddenly deteriorates, even when the level of the public debt ratio appears modest (Das et al., 2010; IMF, 2011; Rawdanowics et al., 2011; Holler, 2013).

Beetsma et al. (2017) conduct an empirical analysis for 16 OECD countries and find that an increase in the average maturity of public debt leads to a lower long-term interest rate. This favourable impact on the marginal cost of long-term public debt is notable in particular for the more vulnerable advanced economies with a relatively short average debt maturity or where inflation is more of a concern. Gabriele et al. (2017) conclude from their empirical analysis of euro area countries that a relatively high public debt-to-GDP ratio may still be sustainable when a country's gross financing needs in the national currency are distributed evenly over time and the interest rate is fixed for a longer period.

A key aspect of similar relevance for public debt managers is the composition of the investor base. While in today's integrated financial markets governments are able to access a global pool of investors and thus attract funds at the lowest possible costs, this also makes them more vulnerable to sudden swings in market perceptions and massive capital outflows. At the first signs of fiscal instability foreign private holders of government debt typically wish to sell their securities and move to 'safe havens' or return to their 'home base', while domestic creditors and unleveraged 'real money' investors may prefer to 'ride out the storm' (Andritzky, 2012; Jaramillo and Zhang, 2013; Arslanalp and Poghosyan, 2014).[5] This explains that a higher share of government debt held by domestic

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[4] Note that a currency depreciation or devaluation would negatively affect debt dynamics by raising the local currency value of debt outstanding in foreign currency and of the stream of interest payments on that debt. Euro area countries have issued only a very small amount of (non-euro) foreign currency debt. The aspect of exchange rate volatility is therefore not separately included in equation (3.1).

[5] One should be aware that the ultimate beneficiary of the government bonds of a country held by non-resident financial institutions may actually be savers from the country concerned. And vice versa, domestic holders like banks could themselves be largely funded by foreign lenders, creating the potential for a negative feedback loop between the sovereign and the banking sector when these repatriate their capital.

institutional and retail investors as well as foreign central banks and sovereign wealth funds is associated with lower and less volatile bond yields, especially at higher public debt levels.

A more recent phenomenon in advanced economies is the return of the monetary authority as an important holder of longer-term government debt. Government bond purchases by the national central bank associated with outright open-market interventions remove a considerable part of public debt from the capital market while injecting central bank liquidity into the banking system. This lowers capital market rates, flattens the yield curve and dampens market volatility. Moreover, the government pays interest on this part of its debt to the central bank which at some point returns again as dividend to the treasury net of the interest paid on the banking sector's reserve balances.

Official loans from partner countries and multilateral organisations act as a catalyst in stabilising sovereign bond markets and assist troubled countries in overcoming a period of severe liquidity stress. If granted, their concessional interest rates, maturity extensions and other debt relief measures reduce roll-over needs and the burden of debt (Corsetti et al., 2017; Gabriele et al., 2017). The policy conditions attached to official loans should enhance the debt repayment capacity. The superior enforcement powers of official creditors, who may impose sanctions in case of payment arrears, also imply a lower probability of default. Private creditors may also benefit from this risk-reduction, although in case of an initial debt overhang they may face a debt restructuring targeted at limiting the amount of official assistance that is required (Dellas and Niepelt, 2016).

3.3.2 *Solvency aspects of public debt sustainability*

Market participants may just ignore a one-off or temporary increase in the public debt ratio. However, when it is permanently higher and rises above a critical threshold, the level of public debt is likely to raise solvency concerns, especially in conjunction with large unfunded public pension and health care promises and contingent government liabilities. These concerns will be reflected in higher default risk premia in sovereign bond yields and feed through to effective interest payments (Attinasi et al., 2010; Turner and Spinelli, 2012, 2013).

Empirical findings also suggest that a high government debt ratio beyond a critical threshold on balance tends to lower output growth (see Baum et al., 2013, on the euro area experience). As in past episodes the correction of such a public debt overhang often lasted for more than a decade, the cumulative shortfall in output is potentially very large (Reinhart et al., 2012).

Hence, an excessively high public debt ratio could generate its own negative debt dynamics: as is clear from equation (3.1), for a given primary balance a wider $(i_t - g_t)$ spread leads ceteris paribus to a positive change in b_t. The need to generate primary surpluses of sufficient size to offset these negative debt dynamics seriously limits the room for manoeuvre for fiscal policymakers and their ability to absorb adverse shocks. Taking these considerations into account, a stricter but safer requirement for fiscal sustainability is the ability to ensure a steady decline in the gross debt-to-GDP ratio ($\Delta b_t < 0$). The aim should be to reach a prudent, low level that ensures adequate budgetary room for manoeuvre and

convinces markets of a country's fiscal discipline and ability to deal with contingent liabilities. This implies that gross government debt relative to GDP is not just rolled-over (taking account of nominal GDP and interest rate developments), but actually reduced at an ambitious pace.

3.4 Strategies for securing public debt sustainability

Given the economic and financial variables driving the accumulation and composition of public debt in equation (3.1), two basic strategies may be distinguished that governments could potentially use to stabilise and reverse the course of a rising debt-to-GDP ratio while also securing continued market access, namely orthodox and heterodox approaches (see Reinhart et al., 2015).

The menu of *standard or orthodox public debt management policies* comprises:

1. fiscal consolidation and reducing budgetary risks to achieve a lasting primary surplus,
2. promoting sustained economic growth,
3. enhancing the management of public sector assets, and
4. arranging for voluntary support in a fiscal crisis.

The main *non-standard or heterodox public debt management policies* include:

1. creating a captive domestic investor base through financial repression,
2. suppressing the implicit nominal interest rate paid on debt,
3. generating unexpected inflation to reduce the real value of debt, and
4. using the state's powers of repression and expropriation to offload public debt.

In addition, some governments may decide to take recourse to creative fiscal accounting (Irwin, 2012).

According to Reinhart et al. (2015), advanced economies officially favour the orthodox approaches for making public debt sustainable but have in the past also frequently relied quite heavily on the heterodox menu of choices. These standard and non-standard public debt management strategies are further discussed in Sections 3.4.1 and 3.4.2, respectively. Since a higher share of domestic creditors in principle helps to stabilise the demand for public debt, Section 3.4.3 tunes in on the potential for public debt managers to create a more captive investor base that is at risk of being drawn into financial repression with little chance to escape. Section 3.4.4 briefly reviews the economic costs of financial repression.

3.4.1 Standard strategies to secure public debt sustainability

Liquidity aspects of public debt sustainability

The ability for governments to maintain market access at sustainable interest rates at all times is a key component of a country's fiscal sustainability and demands prudent public debt management strategies as well as strict budgetary discipline to sustain investor confidence in the sovereign's creditworthiness (see Das et al., 2010; IMF, 2011).

Public debt managers have several ways to manage debt supply more actively and to ensure a deep and liquid market, which is of vital importance when they need to fund a high and rising public debt in more challenging market conditions (Wolswijk and de Haan, 2005). They are usually inventive in fine-tuning the characteristics of the supply of government debt securities in such a way as to make them more attractive for potential investors to buy and hold them in their portfolios. For example, they could adopt innovative issuance techniques that offer buyers protection against maturity mismatches (long-term bonds for institutional investors), inflation risk (index-linked bonds for investors that fear price increases) or exchange rate risk (US dollar debt for non-EU buyers). Or they could target debt supply more directly at domestic audiences, such as retail investors, pension and insurance funds, and of course banks.

Governments have the sole authority to raise taxes and can therefore always ensure debt-servicing by collecting more tax revenues, in addition to cutting spending to make room in the budget. Yet, there is a limit to the ability to generate substantial tax income in the short run without causing large negative feedback effects on the economy and tax evasion (see European Commission, 2011, p. 169). When further tax increases would undermine a country's competitiveness or risk a tax revolt the government could in theory issue state-contingent debt whereby debt-service payments are made dependent on the state of the economy and hence the sovereign's capacity to extract tax revenues. GDP-linked bonds offer in this respect the advantage of a 'recession insurance' that automatically lowers the maturing principal and/or the related interest payments when a country is confronted with an economic downturn and a lower tax income. By contrast, when the economy is booming, investors in GDP-linked bonds will receive a higher principal and return.

GDP-linked bonds have so far been issued only in the context of a public debt restructuring or to offer a reward to investors on top of the coupon payment when output growth exceeds a minimum level. More recently, state-contingent bonds have attracted interest as an automatic shock absorber that is particularly suitable for EMU countries that have no access to monetary policy tools and few fiscal policy options (Brooke et al., 2013; van Riet, 2017). They help to stabilise the public debt-to-GDP ratio and reduce the likelihood of liquidity stress turning into a solvency crisis by attracting investors that voluntarily accept by contract to internalise the country's tax capacity and the related debt-servicing capacity of the government. While foreign creditors would face both the positive and negative risks surrounding the state of the economy, domestic creditors would in addition observe parallel upside and downside risks in their tax payments.

Governments can also actively manage the demand for their debt securities, in particular by giving reassuring messages about the economic and fiscal outlook. This option gains weight in particular in turbulent markets when foreign investors become more reluctant to buy and hold the country's debt. Creditors from abroad could get concerned about the safety of their investment and prefer to sell their sovereign bonds, even at a loss, to return to their 'home base'. Domestic creditors could feel more

secure and choose instead to enjoy the higher return on the (lower-priced because more risky) bonds of their sovereign while expecting bond prices to recover.

The level of public debt that is tolerated by financial markets depends on the strength of a country's institutions and policies, as well as its default history in terms of outright debt repudiation, debt restructuring and higher inflation (Reinhart et al., 2003). As stressed by Calvo (1988), managing market expectations of continued public debt sustainability is vital to prevent situations of liquidity stress from pushing a country towards the 'bad equilibrium' of an unstoppable sovereign default.

The government will in this respect need to show its determination to realise the 'good equilibrium' of sustainable debt by generating the primary surplus that will stabilise the debt ratio and then put it on a downward trajectory. The fiscal consolidation necessary to restore market confidence could also include measures to cut back the government's exposure to contingent liabilities. These fiscal reforms would be most effective when combined with a more efficient tax system, growth-enhancing spending, as well as structural reforms in labour and product markets to promote the resilience and performance of the economy (van Riet, 2010). This will enhance the government's capacity to grow out of its debt and earn the taxes necessary for debt servicing. In addition, there may be scope to mobilise public sector assets for debt reduction by selling property and privatising public enterprises.

Solvency aspects of public debt sustainability

Should the fiscal situation nevertheless go astray and interest rates ratchet up or markets freeze – which could also occur due to financial contagion coming from other countries – the sovereign would need to have access to non-market funding, debt protection, official assistance, debt reprofiling, or debt forgiveness. Otherwise, even if the country could be regarded as fundamentally solvent (after adopting an austerity programme), market speculation of a rising risk of debt repudiation could easily push it into default (Calvo, 1988). Many of these options for fiscal crisis management are on the borderline of financial repression, which would be crossed if the central bank oversteps its mandate in order to serve the state and creditors are obliged to lend to the troubled government.

As regards access to non-market funding, Werner (2014a,b) argues that a government facing market tensions should stop issuing debt securities at unaffordable interest rates and instead enter into voluntary loan contracts with the banking industry at much lower bank lending rates. This 'enhanced debt management', which prefers non-marketable over marketable debt instruments, shields the government (as well as the banks involved) from adverse market movements and secures its ability to provide a fiscal stimulus (which in his view should be backed by bank credit creation, which through refinancing is fully monetised by the central bank).

Sovereign debt protection could come from a central bank standing ready to act as 'lender of last resort' in cooperation with the treasury with the aim to defuse unwarranted speculation and preserve financial stability. Corsetti and Dedola (2013) and Corsetti (2015) prefer the central bank to commit to contingent open-market operations to credibly enforce a cap on rising sovereign bond yields in volatile

market conditions. The central bank could signal its willingness to purchase sovereign bonds and issue monetary liabilities in return which themselves due to the availability of the 'printing press' are non-defaultable but subject to inflation risk. This monetary insurance should be effective in stabilising a belief-driven fiscal crisis, but without eliminating the possibility of a sovereign default based on fundamentals. To the extent that the central bank has actually absorbed sovereign risk on its balance sheet, it could thus still face major credit losses, which could compromise its ability to control inflation and the credibility of this monetary backstop. Corsetti and Dedola (2013) and Corsetti (2015) point out that this constraint could in turn be solved by a credible commitment from the ministry of finance to cover potential losses on the central bank's monetary policy operations. However, the necessary coordination between the monetary and fiscal authorities also implies taking a consolidated view of their balance sheets, which appears inconsistent with central bank independence.

As Corsetti (2015) and others have pointed out, engineering unexpected inflation can only work as a monetary backstop for government debt securities with a long maturity and a fixed coupon, which allows time for sustained, modest inflation to erode the real value of public debt. Since market actors will adjust required interest rates to account for higher inflation expectations, the fiscal advantage of debasing the debt will be offset quickly by higher interest payments when the debt has a relatively short maturity or has been issued with floating-rate coupons. Some authors have therefore suggested that the government could issue a high proportion of short-term or variable-rate debt as a commitment device, to signal that the country is unlikely to use inflation to erode the real value of its debt. Hilscher et al. (2014) note that after quantitative easing the central bank will hold a large amount of longer-term government bonds on its balance sheet. Since the public's portfolio of government debt securities will then have a shorter average maturity, the scope for using an inflation surprise to deflate the real value of debt will be more limited. Yet, the treasury will likely respond to the flatter term structure engineered by the central bank's government bond purchases by issuing a higher proportion of debt securities with a longer maturity (Greenwood et al., 2014). To defuse market expectations of a sovereign debt default by inflation, Calvo (1988) recommends that the state signals its commitment to price stability by issuing bonds indexed to the price level.

External official authorities may be willing to offer multilateral financial assistance to a distressed country conditional on an economic adjustment programme. Their 'vote of confidence' could function as a catalyst for stabilising markets and drawing in new private funding. The costs of official financing at concessional interest rates and debt relief measures are ultimately carried by foreign taxpayers. As pointed out by Brooke et al. (2013), the availability of such rescue facilities has a number of negative consequences: they distort incentives and promote moral hazard (both on the part of sovereigns and their creditors), favour debt financing at shorter maturities in line with the duration of an official support programme, increase the exposure of the official sector to the crisis-affected country, and they make a necessary voluntary write-down on subordinated privately-held debt larger and harder to agree.

The consequences of official assistance for private creditors are mixed (see also Dellas and Niepelt, 2016). An upfront debt maturity extension would limit the size of the required official support, at their expense. Still, private creditors would benefit from the fact that the official assistance after debt reprofiling gives nations facing liquidity stress a greater chance of securing debt sustainability than without a maturity extension. And it would in any case be a less costly solution to private investors than an upfront haircut to reduce a debt overhang.

The risk of being confronted with such an earlier-than-usual bail-in of private bondholders should (initially) be expected to increase the credit risk premium in sovereign bond yields, which may also become more volatile. This market response strengthens market discipline on the government to maintain its creditworthiness. On their part, private investors will have to be more cautious in lending to governments, as in times of serious fiscal stress the necessary official support would in principle only be used to finance new debt and not to repay the maturing government bonds. The need for market participants to take this potential debt reprofiling into account also reduces the implicit subsidy that private creditors enjoy when they may count on the official sector to step in with loans and/or market access support for a troubled country.

Finally, Krugman (1988) highlights the choice that private investors have between continuing to finance debt issued by a distressed sovereign (thereby accepting the risk of an outright default) and forgiving part of the debt (which increases the chances of continued debt servicing). Weighing these options, debt forgiveness could turn out to be the least unattractive choice.

3.4.2   *Non-standard strategies to secure public debt sustainability*

Liquidity aspects of public debt sustainability

One typical response to a fiscal crisis is that the state uses its vast powers of persuasion, regulation and taxation to oblige its domestic creditors to internalise the intertemporal budget constraint it faces. The literature describes the practice of lengthening the average maturity of public debt as establishing a 'fiscal insurance' that helps a country confronted with a negative shock to reduce its short-term gross financing needs. This strategy preserves its budgetary flexibility to support the economy in a downturn and arguably has positive welfare effects because official tax rates can be kept constant (Faraglia et al., 2008; Missale, 2012).

The ability of the treasury to activate a financial repression tax as an exceptional source of revenues and/or as an instrument of enforcing debt roll-over in volatile markets can be regarded as a similar fiscal insurance. The value of this financial repression tax rises with the level of public debt and becomes critical in times of fiscal stress when the sovereign is unable to raise the income from explicit taxation (e.g. when tax rates are already high and the tax base is narrowing) and the country may be pushed into default. Chari et al. (2016) derive a neoclassical model to determine under which circumstances financial repression is optimal. They show that, whenever a benevolent government is able to make a credible commitment to repay its debt, it is preferable to avoid the high economic costs

of a default by increasing taxation rather than by obliging banks to hold more government debt which crowds out productive investment. By contrast, in a severe fiscal crisis or in a time of war when the government cannot credibly commit to service the debt, it may be optimal to use financial repression as a tax-smoothing device and to force domestic investors to take more government bonds on their balance sheet. This model suggests that the more binding the fiscal sustainability constraint is, the more severe the degree of repression should be in order to prevent the costs of a disruptive sovereign default. At the same time, calling in this fiscal insurance itself introduces significant economic distortions, financial stability risks and distributional effects that accumulate over time, indicating that it is only a temporary solution to overcome a period of fiscal distress.

A government that needs to secure its short-term financing needs may try to establish captive sovereign debt markets susceptible to financial repression. The most common method of binding creditors is by arm-twisting domestic retail savers, banks and institutional investors into buying and holding more of the debt instruments of their own sovereign. Favourable provisions for capital and interest taxation specifically related to domestic government bond holdings are widespread in OECD countries (Norregaard, 1997). Special tax credits, tax exemptions and subsidies can raise the after-tax return on public debt instruments compared to private securities or offer retail investors exclusive rewards for holding their government bonds to maturity. Furthermore, the prudential authorities could be confronted with political pressure to declare government securities as 'risk free' by definition in a wide body of financial legislation or to discriminate between banks' exposure to domestic and foreign government bonds in their supervision. In addition, regulators may impose an interest-rate ceiling on bank deposits as a measure to prevent excessive price competition among banks for savings that enjoy deposit insurance from the government. But a deposit rate cap could also be expected to induce retail savers towards placing a larger share of their assets in government bonds with a more attractive return.

A high share of domestic creditors drawn in by regulatory or tax advantages, in principle, allows the government to use local savers and investors as 'lenders of first resort' (by urging them to invest in sovereign bonds on concessional, below-market terms) when fiscal austerity is unattractive or market conditions deteriorate; and eventually, to call on them as 'lenders of last resort' in turbulent times (by exercising moral and political pressure on citizens to purchase government bonds out of solidarity) when the central bank declines to assume this role (see also Ongena et al., 2016). This may have to be combined with controls on capital outflows to avoid that these residents try to escape and place their money abroad.

Giovannini (1988) considers the fiscal benefits of regulating international capital movements. The state may wish to impose a tax on investment income so as to fund necessary public spending and mitigate a high debt problem. As this will fuel capital flight the introduction of capital controls could be seen as an effective response to tax evasion by preventing residents from moving their savings abroad. Aizenman and Guidotti (1994) also explore the benefits for high-debt governments of placing restrictions on the outflow of capital. Capital controls create a wedge between domestic and

international real interest rates and make it cheaper to refinance public debt at local market conditions. Their model shows that the lower interest expenses are an attractive alternative source of income for countries facing high tax collection costs. At the same time, the segmentation of domestic and foreign capital markets to establish a captive investor base prevents local savers from diversifying their portfolio across borders and will lead them to demand a higher equity risk premium on shares issued by domestic firms (Bruni et al., 1989). Governments would thus need to compare the economic and budgetary costs and benefits of allowing capital to leave the country as a result of tax evasion with those of imposing capital restrictions that avoid the associated high tax collection costs.

The fiscal insurance offered by domestic captive investors may lead to a conflict between the interests of creditors and taxpayers and trigger economic and distributional concerns. On the one hand, a larger domestic investor base reduces the temptation on the part of governments to inflate their debt away or to default, as this would hurt the real wealth of their own people rather than that of non-citizens. A concentration of sovereign debt in the hands of residents can be seen as a commitment by the government to support confidence among home as well as foreign creditors that its debt obligations will always be honoured, if need be, by imposing higher taxes (although this commitment may be less firm if tax increases are perceived as distorting or could trigger strong popular resistance).

On the other hand, for the government a high share of resident investors facilitates influencing financial market conditions with the objective of easing its debt burden to the benefit of taxpayers. Low and middle income citizens that are nudged into putting their savings in sovereign debt at below-market interest rates then often bear the brunt, as they forego the opportunity to place their money elsewhere at a higher return. By contrast, wealthy savers are likely to be more aware of repressive actions and in a free market economy they may be able to escape by investing in unaffected financial instruments or transferring their savings abroad. This could also prevent them from being confronted with a capital levy or a sovereign credit event.

The government may also impose mandatory lending to the state as a way to deal with a fiscal emergency, but must then also ensure that the wealthy citizens will get their money back once the sovereign debt crisis has been overcome. This is broadly what Keynes (1940) had in mind when he proposed to make compulsory savings available to the UK government for financing the war effort and to repay these mandatory loans after the war through a one-off capital levy. This solution to market access constraints would demand from citizens that they transfer current resources to the government for the duration of the fiscal emergency. Still, there is a question of time consistency: after the crisis the then ruling politicians must be willing to honour the commitment made by their predecessors to fully repay the debt with the interest due.

Overall, the potential economic and political factors behind a 'home bias' in government debt ownership are wide-ranging, making it rather complicated to establish a direct link with financial repression when a repatriation of public debt from foreign to domestic investors is observed, for example, in episodes of heightened volatility in sovereign bond markets (see Box 3.1).

Box 3.1 – Economic and political factors behind a 'home bias' in government debt

The appearance of a 'home bias' in the demand for government debt could reflect a number of factors:

First, the government has an interest in promoting a 'home bias' for macroeconomic reasons and because it preserves *tax revenues*. As noted by Krugman (1988), debt service payments to foreigners are a drain on the economy, while paid to residents the money is more likely to be re-invested at home. Hence, a larger share of resident investors sustains domestic growth and helps to generate the tax revenues necessary for servicing the debt. The greater security of an uninterrupted debt service in turn makes it attractive for domestic investors to buy bonds of their own country.

Second, financial institutions may simply be responding to *market developments* and substitute into the most profitable instrument (Angelini et al., 2014). For example, when comparing risk-adjusted returns on investments in domestic securities and loans banks will prefer to buy own government bonds in episodes of market volatility when the related returns are higher. The realised profits will also help them to absorb losses on non-performing loans to the private sector. A further, precautionary motive is that government bonds are relatively safe and liquid instruments that banks can easily sell to redeem their own maturing wholesale bonds.

Third, from a similar profit-maximisation perspective, banks have an incentive to engage in a *carry trade* when the yield curve is sloping upward. They can use cheap and low-risk short-term funding in wholesale markets or from the central bank to buy higher-yielding longer-term claims on their own government in order to pocket the attractive interest rate spread while accepting the corresponding higher sovereign credit risk (Acharya and Steffen, 2015). While both foreign and domestic banks may engage in such carry trades involving a country's bonds, the higher the credit risk involved the more banks from abroad are likely to shy away from such investments.

Fourth, resident banks price the credit risk for their own government lower than their foreign peers and reinforce an existing sovereign-bank nexus (Andreeva and Vlassopoulos, 2016). More fragile, undercapitalised banks may be particularly keen to act as buyers of last resort for domestic government debt. While their cost of funds may be partly protected from a sovereign default (given deposit insurance and cheap central bank funding) their revenues from lending to the domestic economy are highly correlated with the performance of their own sovereign (Horváth et al., 2015). By investing in distressed own government debt rather than more secure bonds issued by foreign governments they reach for extra yield on their portfolio. The purchase of more risky, but higher-yielding home country bonds represents a *gamble for resurrection*, because domestic banks increase the riskiness of their portfolio while betting that the additional credit risk will not materialise and the gamble for a higher return on equity will pay off. This behavior is consistent with a 'risk shifting' strategy whereby creditors bear the full risk of a default on their claims whereas the risk exposure of shareholders is capped by their participation in the bank's capital and they still profit most from the potential gains (Acharya and Steffen, 2015; Drechsler et al., 2016). To benefit as long as possible from this crisis-driven domestic demand for sovereign bonds, a government seeking to increase its debt capacity could even be reluctant to recapitalise resident banks, while accepting the concurrent costs from crowding out bank lending to the private sector (Crosignani, 2017). At the same time, when risky banks shift their portfolios towards domestic sovereign debt, they effectively raise the barrier for the public sector to bail out systemic banks in trouble, since a debt-financed intervention would increase the sovereign's own credit risk and has the potential to impose capital losses on the same banks that it wants to rescue (Demirgüç-Kunt and Huizinga, 2013; Gaballo and Zetlin-Jones, 2016). Following this line of reasoning, the tighter nexus between banks and their sovereign reflects how the market mechanism reduces the government's temptation to rescue its systemic banks and thereby disciplines the banking system's risk-taking behaviour.

Fifth, the *secondary-market theory* of sovereign debt assumes that a government cares more about the wealth of its domestic creditors than about that of foreign debt holders. This theory predicts that a fiscal crisis due to deteriorating fundamentals and rising default expectations will trigger an endogenous repatriation of public sector bonds (see Brutti and Sauré, 2016 and Cornand et al., 2016). During episodes of fiscal distress governments will be more tempted to default than in normal times.

Foreign investors will then tend to reduce their exposure, sell their sovereign bonds in the secondary market at a discount and leave the crisis-hit country. By contrast, domestic agents have the power to vote to protect their creditor interests and may expect that for political reasons their government is less likely to default on them than on foreign investors and that even when a default occurs they would be treated preferentially or get compensation (Barrell, 2011; Erce, 2012; Gros, 2013; Broner et al., 2014). The resulting increase in the home bias among investors in turn raises the sustainable level of public debt, as refinancing becomes easier and resident owners of debt may be more willing to pay for the higher taxes to prevent a default. This turns the home bias, if it is sufficiently strong, in a stabilising force that eases the fiscal crisis in the short run and ultimately counters the government's temptation to default (Cornand et al., 2016). Hence, for domestic investors it is attractive to purchase more bonds of their own government in the secondary market. They will expect that the market price of these bonds will recover, because a larger share of sovereign debt held by residents both reduces the government's incentive and its need to default and hence lowers the credit risk premium. In addition, it lowers the chance that the government opts for higher inflation to reduce the real value of its debt (which is also a form of default), as this would hurt the real wealth of its own citizens. The lower risk of default should also reassure foreign investors and may lead them to return after the fiscal crisis has abated.

Sixth, in a monetary union context, investors holding debt of their own sovereign are better protected against the adverse impact of a break-up of the single currency. Their demand for domestic government bonds entails buying a hedge against the risk of a *currency redenomination*, since in case of a currency conversion both the national assets and liabilities on their balance sheet would be affected in the same way (Battistini et al., 2014). While for any monetary union with a unitary state this convertibility risk should be remote, the eurozone proved to be vulnerable to this risk as the sovereign debt crisis intensified.

Seventh, considering the eurozone, banks may be responding to *prudential legislation* that allows them to apply a zero-risk capital weight to holdings of central government bonds denominated in the euro (see Chapter 5). Hence, a shift in the composition of bank assets from private to public debt securities facilitates their risk-weighted deleveraging. Moreover, bank holdings of sovereign bonds are exempted from the large exposure limit that applies to private assets. Given the potential profits, banks may be willing to pay a relatively high price for risky government debt that prudential rules classify to be safe, taking excessive risks with depositors' money. Although the privileged regulatory access to capital benefits all euro area sovereigns, troubled banks could prefer purchasing the debt securities of their own government. After all, without a genuine banking union, banks facing serious financial difficulties will initially need to call on national resolution mechanisms (Valiante, 2014). They may also recognise that with more domestic holders of government debt the cost of a sovereign default will be higher and the state will have a stronger incentive to avoid it (see arguments above). The growing preferential treatment of government bonds in EU prudential banking legislation and its extension to other financial sectors has further tilted incentives towards buying and holding own sovereign debt. As this reduces the cost of public sector borrowing during times of fiscal stress, this regulatory privilege effectively allows governments to gamble for resurrection, using the financial system as the 'gambling table' (Livshits and Schoors, 2009).

Finally, financial institutions may be under the influence of outright *financial repression* as they are induced by a myopic government to make sub-optimal portfolio choices. For example, in a fiscal crisis they could be confronted with moral suasion to load up on domestic sovereign bonds, supervisory measures seeking repatriation of funds, and political pressure to invest more heavily at home. The purpose of this financial repression is to create a captive domestic investor base that internalises the financial constraints of the sovereign, possibly in return for fiscal guarantees and political favours (Acharya and Rajan, 2013; Becker and Ivashina, 2014; Horváth et al., 2015). A government in fiscal stress may also appeal to the patriotic duty of resident credit institutions, in particular state-controlled banks, to act as buyers of last resort when it has to issue debt in difficult market conditions (Ongena et al., 2016). Credit institutions may be persuaded to comply with this moral suasion as long as they can pledge the risky government bonds as collateral for additional loans from the national central bank. Their use as collateral with the common central bank of a monetary union effectively transfers these sovereign credit risks to a common pool, although haircuts on the value of the collateral should be

expected to prevent the implied risk-sharing between member countries (Uhlig, 2014). Financial repression increases the share of domestic creditors and since this deeper 'entanglement' also increases the costs of default falling on residents, the government will have a stronger incentive to repay its debt, including to foreign creditors. A successful collusion between governments and banks to lower their interrelated risks of default could help to reduce both sovereign and bank CDS spreads and stabilise the capital market. Once confidence is restored, foreign investors could be willing to maintain or rebuild their country exposures and financial repression could be diminished.

Solvency aspects of public debt sustainability

When the fiscal situation is unsustainable, the government may in the end decide to resolve its solvency crisis by confiscating wealth, using two potential tools for reducing a public debt overhang ex post: the expropriation of foreign assets and a bail-in of creditors.

First, the state may be tempted to expropriate foreign direct investments (which could scare off investors from abroad), using the proceeds to reduce public debt and/or the country's external debt. This politically attractive solution to relieve the debt burden on domestic taxpayers could involve nationalising strategic economic activities (e.g. network industries and commercial banks) or reducing the property rights on domestic assets owned by foreigners (see Tomz and Wright, 2013). Violation of private contracts and expropriation is normally prevented by binding national law and enforced by judicial courts, treating residents and non-residents on an equal basis.

Second, the government may decide to restore its solvency by bailing in its creditors. The state could exercise the default option of unexpectedly inflating away the real value of its debt with the help of a subservient central bank, engineer a debt restructuring (imposing a longer maturity and/or a lower interest rate), enforce a conversion in state-contingent bonds (linked to GDP growth), a write-down of outstanding claims, or a combination of these options (for an overview see Tomz and Wright, 2013).

A financial repression strategy of enforcing sustainable public finances typically includes political pressure on the central bank to continuously support government funding with all its monetary policy tools, in particular by maintaining too low monetary policy rates, accepting public debt as collateral without limit, outright interventions in the sovereign bond market or direct monetary financing of the budget deficit. As a result, monetary dominance turns into fiscal dominance over the conduct of monetary policy, i.e. the central bank gives priority to securing the sustainability of public debt instead of fulfilling its price stability mandate (cf. Sargent and Wallace, 1981). The combination of suppressed interest rates and an excessive increase in the money supply implies a depreciation of the currency and rising inflation, also known as a default by stealth. This monetary solution to a debt overhang trades the economic cost of outright default against those of persistently higher inflation.

Considering the limitations of placing a cap on interest rates, Keynes (1923, pp.54-55) thought of alternatives to making credit affordable to the government. He noted that there is a maximum burden of public debt that taxpayers are willing to bear: "if it has become clear that the claims of the bond-holder are more than the taxpayer can support", three methods can be considered of "moderating the claims of the *rentier,* when the State's contractual liabilities, fixed in terms of money, have reached an

excessive proportion of the national income". The three options he put forward are debt repudiation, currency depreciation and a capital levy imposed on the bond-holding class. Keynes preferred the levy "on the grounds both of expediency and of justice", i.e. a claim on the rentier's wealth.

A captive investor base gives the treasury the opportunity to charge a capital levy when it prefers to service its debt rather than to default on resident creditors. The government could impose a one-off levy on all domestic creditors and use the proceeds to repay them the equivalent face value of the sovereign debt when it matures (see Gros, 2013). While the net wealth position of domestic creditors stays the same, the government cuts its debt outstanding without any need for a forcible debt write-down or default. When the government bonds are held by local financial institutions, the capital levy as well as the debt repayment would have to be intermediated to their own creditors (bank depositors, pension savers, etc.) as the indirect owners of government debt. This option is sure to reduce the attractiveness for resident debt holders of investing in domestic government bonds.

A similar option, often considered in history, is a one-off capital levy on resident wealth owners to deal with a fiscal emergency (which could trigger a tax revolt or capital outflows) in order to make significant repayments on public debt or to finance a debt-buyback operation when the market value of debt is low (see, for example, Eichengreen, 1990; Piketty, 2014). This would mean forcing well-to-do savers to internalise the government's intertemporal budget constraint and then claiming the discounted value of their future wealth tax payments at one fell swoop as enforced savings.

The inclusion of collective action clauses in sovereign bond contracts facilitates reaching the necessary qualified majority approval from investors for reducing their claims in an orderly debt settlement and signals that government bonds are not necessarily without default risk. The higher the share of domestic holders of debt, however, the bigger the damages of a sovereign credit event for the financial sector and the economy would be. Going this route, therefore, will look most attractive when the investor base includes many foreigners, even though it will lock the country out of international capital markets. Historical evidence shows that within a few years defaulting sovereigns were nevertheless able to return to the international capital market, although paying a higher risk premium in bond yields (Reinhart and Rogoff, 2009).

The more extreme approach is full debt repudiation. This option could even entail declining the repayment of official loans from other nation states, as many European countries collectively did in the 1930s on debt owed to the United States (Reinhart and Rogoff, 2013). Countries may also qualify (part of) their outstanding debt as illegal and unlawful, based on the argument that previous rulers used the proceeds to finance their own estate rather than for the benefit of their citizens. This so-called 'odious' debt – which may include debt owed to other countries and international institutions – is no longer recognised by the current government.

Overall, financial repression in particular seeks to achieve that the central bank, the regulator as well as resident investors internalise the financial constraints of their sovereign by constraining the free allocation of savings and investments and imposing below-market returns, notably when government debt is high and capital market conditions are tough. Citizens and financial institutions may even be confronted with a capital levy or various debt operations to restore solvency of the state. These types of financial repression, aimed at resolving a public debt overhang, are sometimes referred to as "sovereign theft" (Tomz and Wright, 2013, p.262). The loss of income and wealth for savers associated with uncompetitive interest rates and a sovereign default will undermine confidence in the government as a trustworthy borrower and in the country's legal system of contract rights.

Foreign creditors can often escape by selling their claims on a country that suppresses (real) interest rates or that is at risk of default, unless capital outflow restrictions are in place. However, foreign holders of contingent convertible bonds may by contract have to roll-over their debt securities when the sovereign has lost market access or another specified contingency materialises. Also, foreign owners of direct investments are mostly unable to liquidate their assets at short notice when they wish to pull their money out of the country. They may under critical circumstances be confronted with an expropriation of their possessions.

More generally, foreign asset holders will likely see themselves as an attractive target when the government faces duress, especially when creditor rights are less secure and capital controls loom large. The fear of being locked-in may trigger a debt and equity run, reflecting a flight to safety whenever non-resident investors get worried about a country's macroeconomic, fiscal and financial prospects. Given the risk of contagion in an integrated capital market, any vulnerable member state of a monetary union may feel the brunt and experience volatile market prices for its own financial assets.

3.4.3 *A captive investor base and public debt sustainability*

The above discussion of fiscal sustainability strategies shows that it is important to distinguish between domestic and foreign holders of government debt, as in turbulent times these two investor categories face different market incentives (willing to hold or keen to sell the debt), as well as different exposure to financial repression (forced to hold or free to sell the debt). While this feature has always been recognised for developing countries which usually had no alternative but to issue foreign (currency) debt, it has traditionally been considered as less relevant for advanced economies with unlimited access to open capital markets. The euro area sovereign debt crisis has reminded economists of the potential risks associated with a high exposure of a member country to foreign holders of its debt. Fickle external investors may be quick to sell their government bonds in response to large negative shocks, causing a 'sudden stop' and a reversal in capital flows, which in turn fuels self-fulfilling expectations of a sovereign debt crisis (see Calvo, 1998, for the mechanics).

To analyse the impact of domestic/foreign owners on public debt vulnerability and the potential stabilising role of official lenders, the debt sustainability equation (3.1) may be enhanced by splitting total outstanding debt as percent of GDP (b_{t-1}) between domestic, foreign and official holders. This

allows – in the spirit of Giovannini and de Melo (1993) – to specify the implicit interest rate paid by the government (i_t) as a weighted average of the implicit interest rates that respectively apply to these three categories of bondholders. The relative weights (α), (ß) and (1-α-ß) are determined by the respective shares of domestic, foreign and official holdings (D^d) (D^f) and (D^o) in the total amount of debt outstanding (D), with the official sector being the residual bond holder. This leads to introducing the following set of equations:

$$b_{t-1} = b_{t-1}^d + b_{t-1}^f + b_{t-1}^o \tag{3.2}$$

$$\alpha_{t-1} = D_{t-1}^d / D_{t-1} \tag{3.3}$$

$$\text{ß}_{t-1} = D_{t-1}^f / D_{t-1} \tag{3.4}$$

$$1 - \alpha_{t-1} - \text{ß}_{t-1} = D_{t-1}^o / D_{t-1} \tag{3.5}$$

$$i_t = i_t^d \alpha_{t-1} + i_t^f (\text{ß}_{t-1}) + i_t^o (1 - \alpha_{t-1} - \text{ß}_{t-1}) \tag{3.6}$$

Sovereign debt in the hands of foreigners (b^f) will typically carry an implicit interest rate (i^f) that includes a market-based credit risk premium. Under free market conditions, domestic holders would get the same implicit interest rate: ($i^d = i^f$). Alternatively, domestic investors may have been induced to buy and hold their part of sovereign debt (b^d) at below-market yields reflecting the presence of a financial repression tax (τ^d) – as proposed by Reinhart and Sbrancia (2015) – that may be proportional to the free market rate. The implicit interest rate that domestic investors receive (i^d) will then be below that earned by foreigners (i^f):

$$i_t^d = i_t^f (1 - \tau_t^d) \tag{3.7}$$

The higher the share (α) of domestic holdings, the larger may be the captive investor base confronted with a financial repression tax, the lower the average implicit interest rate on sovereign debt, and the better the government is protected against a 'debt run' by foreign investors which could lead to an unstoppable default.[6] The country may nevertheless also have to call on external official lenders for financial assistance at concessional interest rates, below the free market rate that a distressed sovereign would otherwise have to pay. Their willingness to provide cheap bridge financing amounts to a financial repression tax (τ^o) that the troubled country imposes on the taxpayers of all partner countries represented in the official institutions. The implicit interest rate that official creditors receive (i^o) will also be below that received by foreigners (i^f) in the free market:

$$i_t^o = i_t^f (1 - \tau_t^o) \tag{3.8}$$

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[6] When domestic holders such as banks are themselves largely funded by foreign lenders, the government may still face the risk of a 'debt run'. The authorities may then tighten prudential rules to prevent cross-border banks from moving their capital and liquidity out of the country.

The weighted average implicit interest rate (i_t) paid by the government combines the free market rate and the two repressed rates, which yields:

$$i_t = i_t^f \alpha_{t-1} (1 - \tau_t^d) + i_t^f (\text{ß}_{t-1}) + i_t^f (1 - \alpha_{t-1} - \text{ß}_{t-1})(1 - \tau_t^o) \qquad (3.9)$$

This shows that any empirical analysis of the implicit rate effectively paid by governments needs to duly reflect the possible presence of a financial repression tax.

Another aspect of the ownership of government debt mentioned above relates to the incentive to default. All bondholders may in principle be confronted with a debt restructuring. This potential expropriation of their assets can be expressed by a factor ρ (the value of which lies between 0 and 1) with which the stock of debt (D) in that case is reduced. The likelihood that the sovereign will decide to default is negatively correlated with the share of domestic creditors, since these citizens may have political influence to prevent it. The extent to which each of the three categories of creditors will be hit affects their shares (α), (ß) and (1-α-ß) in the total amount of debt. Assuming equal (pari passu) treatment, domestic and foreign creditors will be equally affected. By contrast, some official lenders like the IMF will demand full repayment of their loans, whereas others may exceptionally be willing to provide debt relief.

3.5 Financial repression: EU Treaty constraints and opportunities

The Maastricht Treaty of 1992 (now Treaty on the Functioning of the European Union, henceforth: 'EU Treaty' or 'TFEU') contains many legal provisions that lay down the relationship between fiscal, monetary and financial policies in the EU. They protect ESCB/ECB independence in the conduct of monetary policy,[7] exclude monetary financing of public sector bodies, ban the privileged treatment of public debt by financial institutions, forbid an official sector bail-out and subject national governments to market discipline supported by EU surveillance of sound fiscal policies.

The consequence of joining EMU is that euro area governments issue their debt in a currency that is not under their own monetary control. They are in effect 'subsidiary governments', in a similar position as the American States, also issuing only semi-safe debt but participating in a monetary union without a European federal or supranational government that could undertake stabilising actions. Hence, the market perception of euro area national sovereign debt as a safe asset is in principle fragile (see De Grauwe, 2012; Corsetti and Dedola, 2013; van Riet, 2017). Moreover, in a belief-driven fiscal crisis, contagion of other vulnerable member countries remains an ever-present danger. Corsetti (2015, p.3) summarises the situation facing euro area countries as: "bye-bye national monies, hello sovereign debt crises" (paraphrasing Diaz-Alejandro, 1985).

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[7] The European System of Central Banks (ESCB) refers to the ECB and all national central banks (NCBs) of the Member States of the EU. The responsibility for the single monetary policy of the eurozone lies with the Eurosystem and the Governing Council of the ECB as its decision-making body. The Eurosystem is made up of the ECB and the national central banks of the Member States whose currency is the euro. For ease of reference, this study uses ECB and Eurosystem interchangeably for monetary policy issues but refers to ESCB/ECB in the context of the EU Treaty.

Section 3.5.1 reviews the EU monetary, financial and economic governance framework and explains how it is intended to act as a legal barrier to establishing sovereign funding privileges or bail-out mechanisms. As discussed in Section 3.5.2, however, the EU Treaty also contains various openings that EU institutions and euro area governments have exploited since the euro area crisis to support public debt sustainability independently from the capital market.[8]

3.5.1 *EU legal limitations to modern financial repression*

The EU Treaty requires the Member States, the EU and the ESCB/ECB to act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources (TFEU Article 119.1, 120, 127.1). These actions must furthermore be in compliance with the guiding principles of stable prices, sound public finances and monetary conditions, and a sustainable balance of payments. These provisions protect inter alia the free flow of capital and limit the scope for creating low-interest rate havens that would ease the burden of public debt (Lane, 2012).

First of all, the EU Treaty contains strict provisions governing the single monetary policy. They clearly state that the ESCB/ECB's primary objective is to maintain price stability (TFEU Article 127.1). Without prejudice to this objective the ECB is expected to support the general economic policies in the Union. The ESCB/ECB's legal independence in carrying out its statutory tasks is ensured: it is not allowed for it to seek or take instructions from public sector bodies, and public sector institutions in turn must refrain from seeking to influence the ESCB/ECB in the performance of its tasks (TFEU Article 130).[9] These provisions ensure that its decision-making bodies can fulfil their tasks without political instructions, for example, to peg interest rates at an artificially low level to ensure cheap government funding. They aim to preserve monetary stability in the euro area and put in place a high barrier against political dominance.

The Statute of the ESCB/ECB (included in the EU Treaty as Protocol No 4) guides its monetary functions and operations and contains rules on the solvency of its counterparties in credit operations and the adequacy of their posted collateral (complemented by ECB Guidelines on the monetary policy instruments and procedures of the Eurosystem). The provisions allow the ESCB/ECB to undertake credit operations with solvent counterparties against adequate collateral as well as open-market operations by buying and selling outright or under repurchase agreement and by lending or borrowing claims and marketable instruments, whether in euro or other currencies. The ESCB/ECB is moreover obliged to treat public sector securities being pledged as collateral in the same way as that originating from private sector issuers. Any differentiation must be based on objective criteria, notably the level of liquidity or credit risk. The ECB and the NCBs are prohibited from providing credit facilities to public sector bodies, or to purchase government debt instruments directly from them (TFEU Article 123.1).

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[8]   The crisis response has also affected the dynamics of EMU decision-making; see van Duin and Amtenbrink (2016).

[9]   The concept of central bank independence includes four separate types of independence, namely: functional, institutional, personal and financial independence.

Hence, direct monetary financing of governments by 'turning on the printing press' is excluded. A recital of Council Regulation (EC) No 3603/93 further clarifies that central-bank purchases made on the secondary market must not be used to circumvent the objective of this prohibition. At the same time, the ECB and the NCBs may act as a fiscal agent on behalf of public entities (ESCB/ECB Statute, Article 21.2). Many NCBs undertake fiscal agent tasks, for instance by offering an account for government deposits which are used for cash-management purposes and must be remunerated at a market rate. In addition, they often hold government bonds in their own investment portfolio. While these holdings are unrelated to the conduct of monetary policy, the ECB has made these holdings subject to a ceiling.

Furthermore, public authorities are prohibited to adopt measures that establish privileged access to the funds of financial institutions (TFEU Article 124). Privileged access means any binding legal measure that obliges financial institutions to acquire or hold public sector liabilities, or that encourages them to do so by giving them exclusive tax advantages or financial advantages outside the market context. This legislation in principle prevents governments from creating a captive investor base among domestic financial institutions. Compliance with TFEU Articles 123/124 is monitored by the General Council of the ECB and its findings are briefly reported in the ECB's Annual Report.

One of the ESCB's other tasks is to contribute to the smooth conduct of the competent authorities' policies relating to the prudential supervision of credit institutions and the stability of the financial system (TFEU Article 127.5). The European Council may also confer specific tasks on the ECB concerning the prudential supervision of banks and other financial institutions except insurance undertakings. As from November 2014, the ECB was put in charge of the Single Supervisory Mechanism (SSM) as part of the creation of a European Banking Union with the objective to protect the safety and soundness of euro area banks and the banking system (European Union, 2013; see also Box 5.1). This new micro-prudential supervisory function was legally separated from its monetary policy function in order to prevent conflicts of interest. Under the SSM Regulation, the ECB has also been assigned specific powers in the field of macro-prudential policies. The ECB has the responsibility to assess macro-prudential measures adopted by the national authorities in the countries participating in the SSM and – if deemed necessary after consultations – it may apply more stringent measures aimed at addressing risks to financial stability.

The establishment of the main pillars of the European Banking Union with its centralised banking supervision and resolution mechanisms has taken away many of the domestic levers for financial repression (Véron, 2012). Europe's action plan for a Capital Markets Union should further harmonise the legal framework for non-bank credit markets and enhance financial integration, which further constrains the ability of national authorities to repress the non-bank financial sector and domestic capital markets (Véron, 2014).

As regards the accounting and reporting policies of the ESCB/ECB, common rules have been established in accordance with Article 26.4 of their Statute following a prudent approach regarding

unrealised versus realised gains and losses and, hence, for the recognition of income. The rules for retaining earnings, building financial buffers and distributing profits follow ECB and national conventions, respectively. This framework seeks to ensure that the ESCB/ECB is normally able to fund its monetary policy operations without political interference.[10]

Overall, for legal reasons, the scope for political dominance of the ECB and the NCBs is strictly limited. Only by bending or circumventing the rules, stretching mandates, or in covert form, may elements of political interference slip in. Otherwise, if politicians' views about the role of financial markets in disciplining fiscal policy and/or the relationship between national treasuries, their NCBs and the ECB have changed, the EU Treaty itself would have to be amended. Since an EU Treaty change requires all Member States to go along, the ESCB/ECB's statutory independence is exceptionally well protected.

Taken together, these EU legal constraints in the area of money and finance aim to ensure that governments have to finance their budget deficits in the capital market and, hence, are submitted to the discipline of the market mechanism (ECB, 2006). Still, unconstrained access to a large European capital market facilitates deficit financing, in particular for eurozone members issuing their debt securities in the single currency, which might undermine fiscal discipline. Member States therefore also have to observe common rules for sound and sustainable public finances, subject to EU fiscal surveillance and financial sanctions in case of non-compliance (TFEU Articles 121, 126, 136). The Stability and Growth Pact (under secondary EU legislation) establishes detailed EU rules for the conduct of fiscal policies. This comprises both the requirement to adhere to a medium-term budgetary position that is close to balance or in surplus (based on TFEU Article 121) and the procedure ensuring the correction of an excessive deficit (based on TFEU Article 126). During the sovereign debt crisis, the Fiscal Compact introduced a structural balanced-budget rule and an automatic correction mechanism for deviations from this rule into binding national legislation with effect from 2014 (see Koester et al., 2012). As regards economic policies in a broader context, a new EU surveillance framework to prevent and correct harmful and excessive macroeconomic imbalances entered into force in December 2011, i.e. the Macroeconomic Imbalance Procedure (see Kamps et al., 2014).

Finally, should a Member State still get into financial troubles, neither the other Member States, nor the EU institutions, are allowed to be liable for or assume its public sector commitments, for example by extending grants or making capital transfers (TFEU Article 125.1). Still, the EU Treaty offers the option of granting conditional EU financial assistance to countries affected by natural disasters or exceptional occurrences beyond their control (TFEU Article 122.2). A facility for granting mutual balance of payments assistance only exists for EU countries outside the eurozone (TFEU Article 143). As discussed in Section 3.5.2, financial support arrangements specifically for euro area countries have only been established in the wake of the sovereign debt crisis.

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[10] As stressed by Amtenbrink (2005), appropriate institutional arrangements should ensure that in case of a loss a central bank is always able to recover its financial strength over time.

3.5.2 EU legal opportunities for modern financial repression

As Section 3.5.1 makes clear, a combination of market discipline and peer pressure is expected to promote sound fiscal policies and control the moral hazard arising from member countries being able to attract relatively cheap funds in the euro area capital market. Fully in accordance with this philosophy, there were no legal mechanisms at the start of EMU to assist participating countries facing serious liquidity stress or that could have allowed insolvent sovereigns to organise an orderly debt restructuring. The question is therefore: how could financial repression measures that facilitate governments' market funding and debt resolution still find a place in the governance of money and finance at the European level? The answer contains at least five elements.

First, the EU Treaty explicitly allows governments to have *privileged access to financial institutions based on prudential considerations* (TFEU, Article 124), provided that this exemption is not used as cover to establish disguised privileged access (European Communities, 1993). Article 124 states that "[a]ny measure, not based on prudential considerations, establishing privileged access by Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States to financial institutions, shall be prohibited". Council Regulation (EC) No 3604/93 further specifies: "Whereas … prudential considerations may justify departure from the principle of this prohibition; … laws, regulations or administrative actions may not, however, under the cover of prudential considerations, be used to establish disguised privileged access".

Prudential considerations are defined as those that underlie national legislation based on or consistent with European law and designed to promote the soundness of financial institutions so as to protect their customers and to strengthen the stability of the financial system as a whole. This definition appears to comprise both micro-prudential and macro-prudential legislation. Yet, a regulatory bias based on prudential considerations that opens the door to large sovereign exposures in financial institutions may be questioned exactly on prudential grounds. As recent experience has shown, a close connection between financial institutions and their governments may have systemic implications in times of fiscal stress and pose risks to financial stability (see ESRB, 2015).

Second, governments under strain may pursue *financial protectionism* (Visco, 2011). The EU Treaty prohibits all restrictions on the movement of capital and payments between Member States as well as between them and third countries outside the EU (TFEU Article 63.1; see also Bakker, 1996). Without prejudice to this general rule, Member States have the right to apply capital and payment controls on grounds of public policy or public security. They may also introduce distinctive tax provisions and requisite measures to prevent infringements of national tax law and prudential regulations (TFEU Article 65.1). However, such national restrictions must be proportional to the issue at stake and should not lead to arbitrary discrimination or disguised restrictions on the free movement of capital and payments (TFEU Article 65.3).

At the European level, there is also the possibility to approve restrictive tax measures vis-à-vis third countries as long as these are compatible with the proper functioning of the EU internal market, or to place restrictions on capital movements to or from third countries involving foreign direct investment, the provision of financial services, or the admission of securities on the EU capital market (TFEU Article 64.1). Capital controls against third countries may also be allowed as a temporary safeguard in exceptional circumstances when the smooth operation of EMU is under threat (TFEU Article 66). Such financial protectionism contributes to a captive national investor base for sovereigns.

Third, Member States may resort to *coordinated financial sector taxes* that target the banking sector, excessive short-term market activity or destabilising speculation. While direct taxation is largely subject to national control, the adoption of legislation concerning turnover taxes, excise duties and other indirect taxes requires harmonisation of legislation to ensure the proper functioning of the EU internal market and avoid distortion of competition (TFEU Article 113). Given the cross-border impact of financial sector taxes, their introduction would require a common approach that is applied either across the whole EU or through enhanced cooperation between the participating EU countries.

Fourth, the 'no bail-out' rule forbids EU countries and institutions from taking over each other's commitments (TFEU Article 125.1). Yet, it allows them to grant financial assistance on a temporary and conditional basis to a Member State facing liquidity stress (if appropriate with involvement of the IMF). But there was no specific legal arrangement for EMU countries to give each other conditional liquidity support. As an emergency solution when the sovereign debt crisis broke out in Greece in late 2009, Member States first extended ad hoc bilateral loans to this country in spring 2010. Subsequent financial support to crisis-hit countries came from the EU-funded European Financial Stability Mechanism (EFSM) making use of TFEU Article 122.2 and a temporary European Financial Stability Facility (EFSF) established as a special purpose vehicle under Luxembourg private law.

Later, a third paragraph was added to TFEU Article 136 to allow the Member States whose currency is the euro to create a *permanent stability mechanism* to be activated if indispensable to safeguard the (financial) stability of the euro area as a whole. Any required financial assistance granted to liquidity-constrained euro area countries was to be made subject to strict conditionality.[11] This was the legal basis for an intergovernmental treaty between the euro area countries to create the European Stability Mechanism (ESM). The European Court of Justice (ECJ, 2012) argued that the tasks and functions of the ESM are compatible with the provisions of the EU Treaties, in particular the no bail-out clause, provided that three conditions are met: 1) the financial support for a distressed eurozone country serves to safeguard financial stability in the euro area as a whole, 2) it has to observe strict policy conditions, and 3) it remains fully responsible for its own commitments with regard to its creditors. Since the intention is to provide liquidity support only, the implicit understanding is that an insolvent euro area country should instead find another way to return to sustainable public finances, for

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[11] For a discussion from a constitutional perspective see Hinarejos (2015). She argues that the 'no bail-out' rule could only be overcome by the supporting countries stressing their overriding concern for the stability of the euro area as a whole.

example, by negotiating a debt restructuring with its creditors. Alongside, the ECB has accepted a role as fiscal agent for both the EFSF and the ESM to act when necessary on their behalf.

Fifth, the ESCB/ECB Statute foresees that it can undertake outright transactions in financial markets for monetary policy purposes (Article 18.1). The Governing Council of the ECB has interpreted this provision as giving the Eurosystem – acting independently and in accordance with its mandate – the option of undertaking outright *open-market operations in the secondary markets for government debt*; for example, when its policy interest rates have reached the effective lower bound or to address disruptions in national sovereign bond markets that frustrate the monetary transmission process and could challenge price stability in the eurozone.

The European Court of Justice (ECJ, 2015) confirmed that the ESCB/ECB has broad discretionary powers for fulfilling its monetary policy mandate, although government bond purchases had to meet strict conditions to prevent monetary financing. More precisely, it stated that a potential activation of Outright Monetary Transactions (OMT) in disrupted national sovereign bond markets is compatible with the EU Treaty given the declared objective of safeguarding monetary policy transmission and preserving the singleness of monetary policy, which both contribute to the primary objective of maintaining price stability. The economic conditions applicable to OMT interventions preserved "the impetus of the Member States concerned to follow a sound budgetary policy" and thereby provided in its view sufficient safeguards against monetary financing.

This judgement by the European Court of Justice was requested by the German Federal Constitutional Court in a case challenging the legal admissibility of the OMT. In its final ruling, the German Federal Constitutional Court (2016) rejected this challenge as unfounded while listing six prerequisites that the OMT must meet to be acceptable and which it sees as having been defined as 'legally binding' by the European Court of Justice: 1) ESCB purchases of government bonds are not announced; 2) their volume is limited from the outset; 3) there is a 'black out' period that prevents a distortion of the issuing conditions for government bonds; 4) Member States must have bond market access at the time of purchases; 5) only in exceptional cases the purchased bonds are held to maturity; and 6) purchases are restricted or ceased and purchased bonds are remarketed when they are no longer necessary. These conditions were in its view also applicable to any other government bond purchase programmes.

Taken together, these five elements of financial repression in the governance of money and finance have one common characteristic: they primarily focus on maintaining or restoring stability in stressful times and function as a safeguard against destructive scenarios, i.e. they can be regarded as interventions for public policy purposes. After the crisis, however, the quest for a more resilient European economic and financial system and a stable EMU has led the competent EU authorities to establish (additional) sovereign funding privileges which weakened the beneficial influence of capital markets on fiscal discipline. Enhancing the privileged role for public debt in European financial and monetary policies could undermine national incentives for fiscal reforms and is in economic terms equivalent to applying the financial repression techniques known from the past.

3.6 Framework for the analysis of modern financial repression in the euro area

The remainder of this study examines which tools of modern financial repression have been used in the euro area over the past decade to channel funds to the state and keep a lid on government bond yields. The framework for this analysis is threefold:

First, Chapter 4 considers how euro area countries have applied a range of *non-standard public debt management* techniques as a complement to standard methods to manage both the supply and demand of their debt instruments, notably during the sovereign debt crisis. One objective was to secure capital market liquidity by creating a more captive domestic investor base, whereas in two cases a debt restructuring had to restore government solvency.

Second, Chapter 5 tunes in on EU legislation contributing to a *preferential regulatory treatment of sovereign debt* which should be expected to dampen the cost of government borrowing The many (expected) changes in EU prudential law since 2008 are likely to nudge banks, institutional investors and other market participants into lending out to governments larger amounts of funds than otherwise, creating capital market conditions more favourable than for private sector borrowers. Moreover, euro area governments confronted with a fiscal crisis can rely on new financial assistance mechanisms.

Third, Chapter 6 studies how *ECB monetary policy* managed to lower euro area average interest rates and flatten the euro area sovereign yield curve while reducing sovereign risk premia and bond spreads across member countries. With their outright purchases of national public sector securities, the ECB and the national central banks in fact absorbed a large amount of sovereign risk on their balance sheets.

Chapter 7 completes the analysis with a brief study into the empirical relevance of these three types of tools of modern financial repression for the euro area average of government borrowing costs.

3.7 References

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4. Crisis-related public debt management in euro area countries

… policymakers for some time to come will be preoccupied with debt reduction, debt management, and, in general, efforts to keep debt servicing costs manageable. Kirkegaard and Reinhart (2012)

4.1 Introduction

Over the past few years, many euro area countries faced a twin challenge: to maintain short-term market access for a continued smooth funding of high and rising sovereign debt at affordable interest rates; and to restore the government's longer-term creditworthiness. Hence, their concerns about the sustainability of public debt related to both liquidity and solvency aspects. This dual perspective gained prominence in the euro area sovereign debt crisis, as in the face of adverse expectations even a solvent country may see a liquidity crisis quickly turn into a self-fulfilling default.

Prudent public debt managers will try to limit the fiscal vulnerabilities associated with the financing structure and the investor base of government debt (Hartwig Lojsch et al., 2011). In this respect, a high share of fixed-rate debt with a long average maturity is critical in creating a 'fiscal insurance' against adverse shocks to the budget and keeping debt sustainable (Missale, 2012). Having more 'buy and hold' investors on board should also offer some protection against shifts in market sentiment (Andritzky, 2012; Jaramillo and Zhang, 2013). Public debt managers are furthermore keen to build a strong reputation for an uninterrupted debt service, especially with foreign lenders, who are often more sensitive to changes in a country's creditworthiness than domestic creditors. This enables them to draw on a global pool of capital at the lowest possible costs (Arslanalp and Poghosyan, 2014).

A relevant question is therefore how euro area countries have managed their high and rising public debt in the wake of the 2008 financial crisis and the deep economic recession. Those confronted with adverse shifts in market perceptions about the sustainability of public debt experienced heightened market volatility, a tightening of liquidity constraints and growing solvency concerns. As the euro area first witnessed in relation to the Greek fiscal shock in late 2009, the subsequent jump in government bond yields triggered growing fears – in particular among investors from abroad – of uncontrollable debt dynamics. The result was a 'sudden stop' in foreign funding and a reversal of capital flows. This "run for the exit" (Lane, 2012, p. 60) caused a further rapid rise in market interest rates and fuelled self-fulfilling market expectations of a sovereign default. This in turn also hurt the perceived creditworthiness of private borrowers.

Moreover, the market panic contaminated other euro area countries, in particular those with a large external debt arising from foreign financing of persistent government and current account deficits and substantial short-term funding needs (Gros, 2013; Dell'Erba et al., 2013). These vulnerable euro countries looked for ways to protect themselves against the liquidity and interest rate shocks triggered by sudden shifts in market sentiment and the retreat of foreign investors, which reflected concerns about their weak fundamentals, the vicious sovereign-bank feedback loop and the future of the euro.

When faced with crisis or war, European governments in the past often took recourse to financial repression and initiated state interventions with the aim to control the flow of funds and ensure an affordable interest rate, including through the monetary policy operations of the central bank and the prudential measures of financial regulators (Reinhart et al., 2011). The authorities often justified their interference in money and finance with public policy goals and the need to reallocate savings to the state at favourable conditions. After the emergency was over, financial repression continued to be employed as a fiscal and quasi-fiscal tool to reduce the heavy burden of government debt, as evident in the decades after World War II (Reinhart and Sbrancia, 2015).

Some euro area countries under fiscal stress again appear to have embraced certain aspects of financial repression in the 2010-2012 sovereign debt crisis characterised by falling market liquidity, growing solvency concerns and rapidly rising government bond yields. Their fear for an uncontrollable 'debt run' created strong incentives to go beyond standard public debt management tactics and to focus on creating captive buyers of government bonds, so as to reduce the cost of funding and thereby restore fiscal sustainability. This 'non-standard' crisis response relied on the ability to draw upon domestic savers and investors as 'lenders of last resort' to stabilise the fiscal situation and counter self-fulfilling default expectations – even when the resulting portfolio shift of domestic investors towards national government debt also occurred endogenously, driven by market processes and a search for yield.

The crisis-induced home bias was further supported by the growing preferential treatment of government bonds in new and revised EU financial sector legislation, which effectively turned domestic savers and investors into 'lenders of first resort' for their sovereigns (see Chapter 5). The national efforts to enforce a home bias for government debt were also motivated by a political wish to avoid the stigma effect and the strict policy conditions attached to official financial assistance; and when a request for this conditional official support became unavoidable, to restore the sovereign's debt issuing capacity as soon as possible. The European official creditors assisted their return to the capital market by passing on their own low cost of funding to the troubled euro area countries and to offer them debt relief through concessional lending terms rather than debt forgiveness. Alongside, the ECB helped to keep rising national government bond yields in check when monetary policy concerns called for this intervention (see Chapters 5 and 6).

Several authors have developed financial models to better understand the recent reallocation of investment portfolios towards home government bonds and its impact on sovereign default incentives and on credit supply in the eurozone (see the references in Box 3.1). They point to market forces, carry trades, risk shifting, regulatory responses, supervisory action, moral suasion and political pressure as possible explanations. Chari et al. (2016) derive that in theory it is preferable for crisis-affected countries to use financial repression to avoid the costs of default, in particular by obliging financial intermediaries to hold more government debt. This chapter adds a narrative account to this literature of concrete cases where euro area countries during the sovereign debt crisis introduced 'non-standard' public debt management techniques that can be interpreted as financial repression with a fiscal motive

– aimed at better protecting themselves against fierce market pressure, securing a decent demand for government bonds at affordable costs and, ultimately, at removing the overhang of public debt.

For the fiscal policymakers of over-indebted euro area countries financial repression appeared attractive as a complementary tool to stabilise public finances and avoid the political costs of undertaking fiscal reforms. Hence, they accepted that a quasi-tax on finance also bears significant economic costs, financial stability risks and distributional consequences.

First, a privileged funding by captive domestic investors should ease sovereign market pressure and liquidity constraints. This may give the government some breathing space and more time for fiscal adjustment. However, the easing of fiscal pressure may also distort political incentives for sound public finances. And if fiscal consolidation is delayed for too long, the rising level of sovereign debt could (again) become unsustainable (Asonuma et al., 2015).

Second, undercapitalised resident banks holding a growing share of government debt goes at the expense of credit supply to the domestic private sector. A fiscal stimulus is in this situation less effective because private borrowers are crowded out, especially in turbulent times, when due to financial frictions alternative market funding is scarce (Broner et al., 2014; van der Kwaak and van Wijnbergen, 2017). The lower feasible level of private investment will translate in a lower potential growth path of the economy, unless the government would use its extra debt capacity to fund badly-needed public investments, which is less likely in a fiscal crisis.

Third, financial institutions that are incentivised to maintain a high exposure to their own sovereign are vulnerable to fiscal shocks that lead to valuation losses and weaken their balance sheets. This not only undermines credit supply and output growth, but their negative system-wide impact on banks also poses risks to financial stability (ESRB, 2015). A captive domestic investor base further implies greater national economic damages from a potential sovereign debt restructuring in the future.

Fourth, financial repression favours debt-ridden countries at the expense of its creditors. As such it entails a redistribution of income and wealth from savers to debtors, usually without explicit parliamentary approval.

Altogether, the broad-based costs of repressing finance undermine its direct fiscal benefits and create serious doubts about any proclaimed public policy benefits. All that policymakers might achieve is making a chronically high level of government debt easier to live with in an environment of greater market volatility and lower potential growth (King, 2013).

Section 4.2 discusses the fiscal incentives for euro area countries to engage in financial repression and its contribution to fragmented euro area sovereign bond markets. Section 4.3 considers how public debt managers have adapted their supply tactics to the sovereign debt crisis. Section 4.4 reports selected cases of repressive government interventions in the domestic financial system to manage the demand for public debt. The potential recourse to mandatory loans and capital levies is also discussed. Section 4.5 offers an assessment and concludes.

4.2   Fiscal incentives for financial repression

The focus on both liquidity and solvency aspects of fiscal sustainability requires giving attention to both the incentives of investors looking for an attractive yield and the costs for taxpayers of servicing the public debt. For those that lend money to the government it must be sufficiently attractive to buy and hold sovereign debt without being confronted with unexpected credit risks (Missale, 2013), while a country's taxpayers – even though taxes are compulsory – must be willing to service the public debt on an ongoing basis without being faced with budget surprises that raise the tax burden (European Commission, 2011). The fiscal authorities together with their public debt management offices, within limits, can steer the risks of funding stress and tax volatility as well as control the likelihood of sovereign default. From this perspective, they have the ability to unite the microeconomic portfolio objective of minimising expected debt-servicing costs with the macroeconomic objective of maximising fiscal stability and social welfare (Hoogduin et al., 2011; Holler, 2013).

As discussed in Chapter 3, a higher share of resident holders of government debt facilitates meeting this twin objective considerably. First, it provides more immunity against major adverse shocks that could otherwise lead to a retreat of foreigners, rising sovereign bond yields and severe liquidity stress (Livshits and Schoors, 2009). Second, the tax revenues used for servicing the debt held by residents will stay in the country and could easily be borrowed again in the future (Krugman, 1988). Third, the government could eventually always tax its domestic creditors – in contrast to foreign lenders – if it prefers to repay the debt rather that to default on them (Gros, 2013).

From this perspective, the use of financial repression techniques with the aim to raise the share of resident owners of government debt qualifies as a complementary, heterodox strategy to secure fiscal sustainability (Reinhart et al., 2015). A captive domestic investor base that secures uninterrupted access to savings at favourable (below-market) interest rates offers a hedge against interest rate and output shocks affecting the budget and, hence, stabilises (optimal) tax rates, government spending and the public debt ratio, which according to Faraglia et al. (2008), Missale (2012) and Chari et al. (2016) has positive welfare effects. At the same time, captive resident investors are vulnerable to a debt restructuring that has become unavoidable to remove a public debt overhang.

4.2.1   The fiscal vulnerability of euro area countries

After joining EMU, euro area countries saw a further convergence of their sovereign bond yields to low levels, which for some went well beyond that implied by national fundamentals and to a certain degree reflected the premium assigned by market participants to the perceived privilege of euro area membership (Wiegand, 2017). Following the global financial crisis, however, euro area governments experienced a big jump in their debt-to-GDP ratios (see van Riet (ed.), 2010; Table 4.1) and market participants became much more sensitive to the fundamentals determining sovereign creditworthiness (von Hagen et al., 2011). This change in market sentiment made government funding vulnerable to adverse shocks that could trigger 'sudden stops' in foreign capital flows, rising sovereign bond yields and self-fulfilling expectations that might push them into default (De Grauwe and Ji, 2013).

Against this background, the rise in government debt was a source of <u>five potential concerns</u>, which created incentives for treasuries to mitigate the risks, including through financial repression.

First, governments faced much higher annual gross financing needs in order to fund their bank rescue operations and the coordinated fiscal stimulus measures as well as to absorb the negative budgetary impact from the ensuing Great Recession (see Table 4.1 and Holler, 2013). Gabriele et al. (2017) show empirically that rising gross financing needs of EU countries together with an already high stock of government debt are significant early warning indicators of risks to fiscal sustainability as reflected in their sovereign bond spreads.

Table 4.1 – Government financing needs of the euro area countries and euro area
(in percent of GDP)

	Gross government debt [1]				Gross financing needs [2]			
	2007	**2010**	**2013**	**2016**	**2007**	**2010**	**2013**	**2016**
Euro area 17	66.4	85.6	92.7	90.6	14.5	22.9	20.2	16.5
Belgium	84.0	96.6	101.5	101.8	19.2	26.6	19.0	18.7
Germany	65.2	82.5	78.4	69.2	13.0	24.7	18.2	14.3
Ireland	24.9	91.2	123.7	87.8	12.1	26.5	11.4	6.6
Greece	107.3	148.3	175.1	176.7	20.9	23.8	19.4	14.9
Spain	36.3	61.7	93.9	97.8	10.9	22.4	23.5	18.1
France	64.2	82.7	93.5	97.7	16.5	25.1	22.9	19.9
Italy	103.3	119.3	132.6	136.3	21.6	23.9	26.2	22.6
Luxembourg	6.7	19.5	23.1	19.8	-2.3	1.1	0.5	0.2
Netherlands	45.3	63.4	73.5	67.6	8.6	21.5	17.6	12.4
Austria	60.2	72.5	74.5	77.5	4.1	5.1	11.1	4.9
Portugal	68.4	94.0	129.0	130.3	17.2	23.8	25.1	15.3
Finland	35.2	48.8	57.0	64.1	3.4	12.4	9.1	10.7

Source: European System of Central Banks and Eurostat, based as far as possible on the former ESA 1995 definition. GDP 2016 for Ireland linked to GNI* to correct for large international balance sheet relocations.

Note 1): Euro area debt is based on the Maastricht definition and consolidated for intergovernmental lending.

Note 2): Gross financing needs consist of the government borrowing requirement for the year ahead, plus debt with a residual maturity of up to 1 year minus currency and deposit liabilities (the latter based on the ESA 2010 definition, excluding Ireland).

A second, related source of concern was the prevailing unfavourable maturity profile and interest rate-fixing of government debt, which affected debt roll-over risk (reflected in a high share of debt to be redeemed in the short run) and/or interest-rate risk (given a high share of debt financed at variable interest rates), respectively (see Table 4.2 and Holler, 2013). The shorter the average maturity of outstanding debt and the higher the share of variable-rate debt, the faster rising interest rates in volatile markets would lead to higher interest payments and weaken the sustainability of public finances. For several eurozone countries these risks of adverse debt dynamics were set to materialise.

Table 4.2 – Exposure of euro area countries and euro area to roll-over risk and interest-rate risk

(shares in percent of total government debt)

	Residual maturity of government debt in 2010				
	Up to 1 year	*Over 1 and up to 5 years*	*o/w variable interest rate*	*Over 5 years*	*o/w variable interest rate*
Euro area 17	26.1	33.6	2.9	40.3	2.9
Belgium	24.0	35.5	0.0	40.5	0.0
Germany	28.1	35.5	-	36.5	-
Ireland	-	-	-	-	-
Greece	10.2	41.5	13.8	48.3	15.3
Spain	21.5	35.9	0.0	42.6	0.0
France	33.3	31.7	0.2	35.0	0.1
Italy	25.2	30.4	5.4	44.5	4.2
Luxembourg	9.0	-	-	-	-
Netherlands	29.6	31.7	0.0	38.7	0.0
Austria	8.8	34.2	0.7	57.0	0.6
Portugal	29.5	28.5	1.3	41.9	0.2
Finland	24.0	34.9	12.8	41.1	13.7

Source: European System of Central Banks and Eurostat, as reported by Hartwig Lojsch et al. (2011, Table 15, p. 37).

Note: Data for the Netherlands and Austria refer to 2009.

A third vulnerability, for all euro area countries except Germany, was the fact that the share of domestic 'buy and hold' investors in total government debt was much lower at the start of the financial crisis in 2007 than in 1999 at the start of EMU (see Figure 4.1, which counts non-bank financial institutions, non-financial firms and households to this category). This category of creditors tends to be a relatively cheap and stable source of government funding, notably in turbulent times (Andritzky, 2012; Jaramillo and Zhang, 2013). Public debt managers were of course keen to attract their interest again.

Finally, just as the public sector, the private sector in several euro area countries was highly indebted at the start of the sovereign debt crisis and therefore entered into a deleveraging process that dampened output growth and inflation. Moreover, distressed countries also required significant disinflation to restore their cost competitiveness. As a consequence, high-debt governments risked getting trapped in a debt/deflation spiral, whereby the implicit interest rate on public debt increasingly exceeds the nominal growth rate and moving to a primary budget surplus to stabilise the debt ratio becomes more strenuous. Given this prospect, governments may have looked for 'non-standard' ways to manage their debt and return to stable public finances.

Figure 4.1 – Share of domestic 'buy and hold' investors in selected euro area countries

(percentage shares of non-bank financial institutions, non-financial corporations and households in total gross government debt, for selected euro area countries)
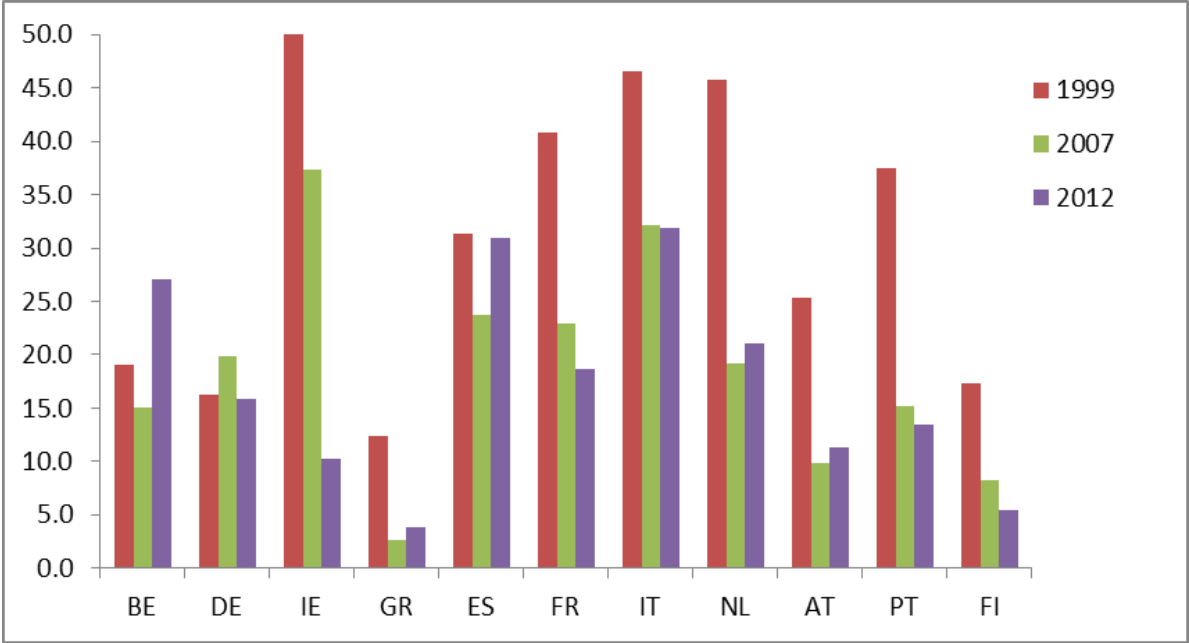
Source: European System of Central Banks and Eurostat, based on the former ESA 1995 definition.

Note: Data for Greece in 2012 relate to 2011, to capture the situation before the sovereign debt restructuring of March 2012.

4.2.2   The euro area sovereign debt crisis and the flight to safety

After the start of the sovereign debt crisis in Greece in late 2009, all vulnerable euro area countries experienced rising market volatility, higher sovereign credit default swap rates and growing capital flight. The adverse shift in fiscal fundamentals caused a sharp increase in the cost of sovereign borrowing (see Figure 4.2), aggravated by negative spill-over effects, as liquidity and default risk premia were adjusted upward and interacted for several euro area governments with the downgrading of their credit ratings. Moreover, a negative feedback loop emerged with a fragile banking system that markets perceived as too-big-to-fail and too-big-to-save (Demirgüç-Kunt and Huizinga, 2013); while banks were increasingly exposed to a declining value of the securities on their balance sheet issued or guaranteed by their own sovereign, high-debt governments with little fiscal space faced the risk of again having to rescue the troubled banks in their jurisdiction.

Greece, Ireland, Portugal and Cyprus were confronted with such high market interest rates that they successively lost capital market access and had to draw on EU/IMF financial assistance and bilateral loans from Member States (see Section 5.3.2 and Henning, 2017). Among the other member countries, in particular Italy, Spain and to some extent Slovenia were confronted with severe market stress. The ECB decided in May 2010 to intervene under its Securities Markets Programme (SMP), buying the government bonds of Greece, Ireland and Portugal and later of Italy and Spain, in an effort to stabilise their debt markets and restore a smooth operation of the monetary transmission mechanism.

Figure 4.2 – Long-term government bonds yields of selected euro area countries, 2008–2016

(in percent per annum; data for Greece are shown on the right-hand axis)
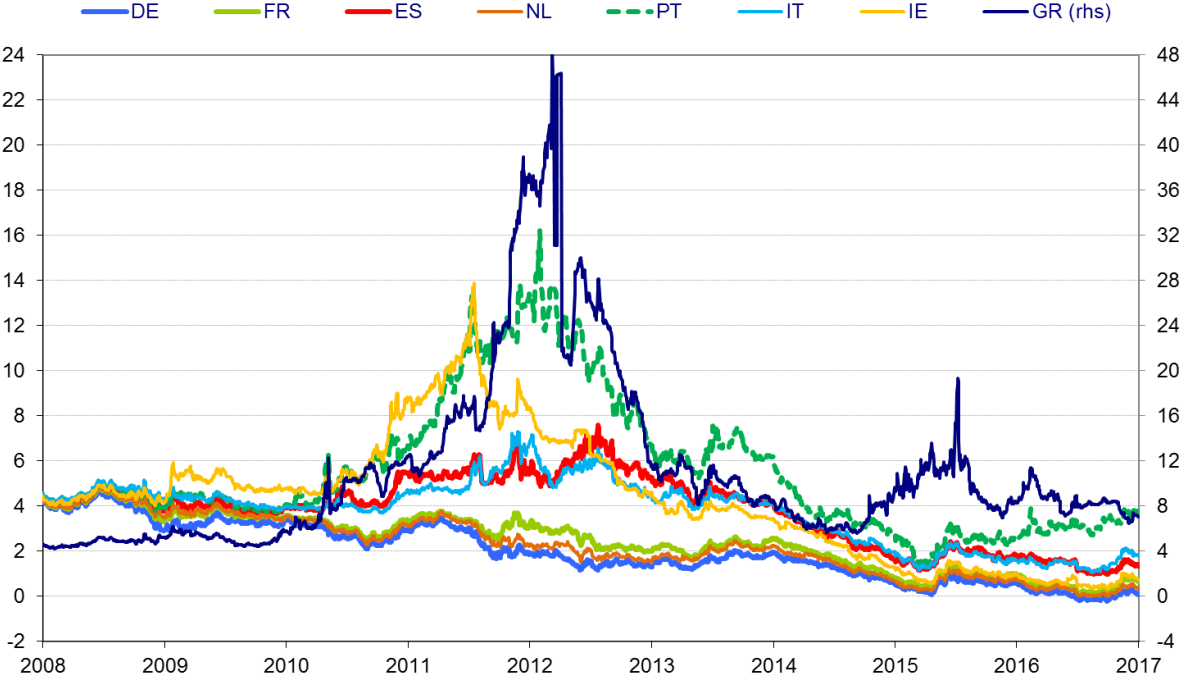
Source: Datastream. Note: Daily data of 10-year government bond yields from January 2008 to December 2016.

The autumn of 2011 saw very high market volatility and many foreign investors residing outside the eurozone shied away from any euro investments, or wanted assurances of the legal consequences of a potential break-up of the euro. Foreign investors from within the euro area sold off their positions in troubled member countries – partly under pressure from national supervisors – and retreated to their 'home base', at least as far as their holdings could be liquidated. Making sure that both assets and liabilities are located in the same euro area country had the additional advantage that in case of a euro break-up their currency denomination would still match.

As suggested by Arellano et al. (2016), the sudden stop in capital flows from abroad also reflected national public debt crises turning into external debt crises, which affected both public and private borrowers. The perception among foreign investors that crisis-hit governments might decide to interfere in private external debt contracts, expropriate foreign assets and impose capital outflow controls could be among the main reasons for this capital flight. After all, the most vulnerable euro area countries were characterised by lower creditor protection standards and weaker judicial enforcement regimes than the 'safe haven' member states (Figure 4.3).

By contrast, euro area countries perceived as having a strong fiscal position and adequate creditor protection benefited from a flight to quality and safety. The flow of capital to safe-havens inside the euro area (but also outside) shows that during the eurozone crisis many foreign investors (other than those engaged in 'carry trades') gave priority to protecting the value of the assets on their balance sheet and gave up a higher but more risky (real) return.

Figure 4.3 – Creditor protection and judicial enforcement in euro area countries
(a positive index value indicates an overall weak legal system, a negative value a strong legal regime)
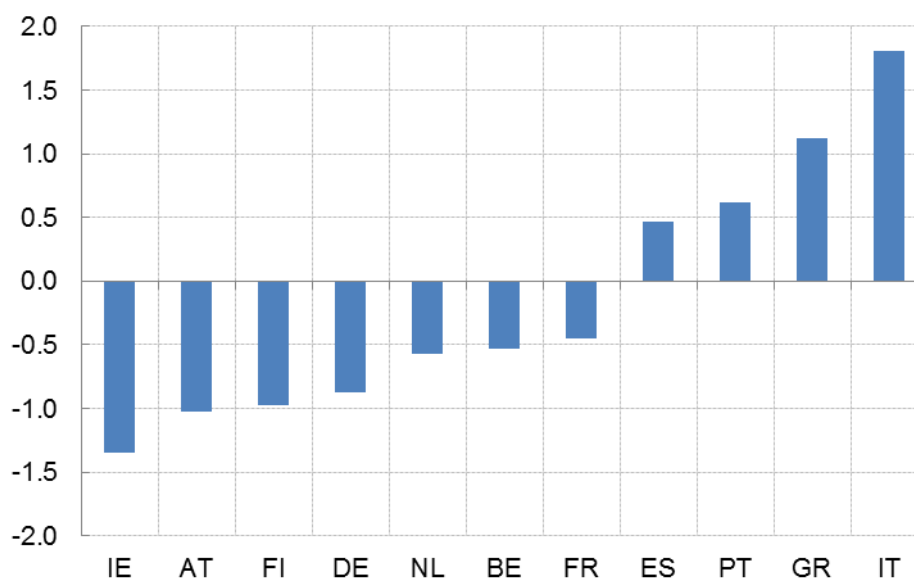
Source: Calculations by Maresch et al. (2015) based on 2009-2014 data from the World Bank and the Heritage Foundation.

Note: The index representing the overall legal system shows the latent variable based on a factor analysis of four indicators covering private creditor protection (the strength of private creditor and property rights) and judicial enforcement (the costs and number of procedures to resolve a dispute).

This risk-off strategy of non-resident investors and the wish of investors to match their domestic liabilities with domestic assets created fragmented euro area sovereign debt markets along national lines of creditworthiness, also reflecting a 'home bias', in particular among banks. As sovereign bond yields act as a benchmark for the financing conditions of the private sector, other market segments in crisis-affected countries became fragmented along the same national lines (see ECB, 2012a,b). More broadly, a north-south divide developed between euro area countries perceived as 'risky' and those considered to be 'safe'. This financial market disintegration fundamentally altered the allocation of capital in EMU, while partly correcting earlier misallocations.[12]

The apparent systemic fragility of the eurozone called the continued existence of the euro into question. The turnaround started with the decision taken by euro area leaders in June 2012 to break the negative feedback loop between troubled banks and their weakened sovereigns by introducing the main pillars of a European Banking Union. Shortly after, the ECB communicated that under conditions it stood ready to undertake Outright Monetary Transactions (OMTs) to counter the appearance of currency redenomination risk premia in the sovereign bond yields of crisis-hit countries. Markets perceived this commitment as a monetary backstop, complementing the fiscal backstops (see

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[12] According to Bijlsma and Vermeulen (2016), Dutch insurers with a reputation to act as contrarian and stable investors sold their tradable southern European assets during the peak of the sovereign debt crisis. But instead of the flight home effect typically found for banks, Dutch insurers reallocated their government bond portfolio towards all the northern European safe-haven countries and not only favoured the assets of their home country. This investment behaviour suggests that both the quality of their assets and the benefits from international risk diversification are key elements for the relatively risk-averse insurance sector.

also Section 5.3.2 and van Riet, 2016). As a result, government bond yields declined substantially (see Figure 4.2), offsetting the previous self-fulfilling default expectations in the interest rates of distressed countries that had represented a potentially catastrophic 'tail risk' for the eurozone (Draghi, 2013).

Looking back, Delatte et al. (2017) identify the negative sovereign-bank feedback loop as the main driving factor of the crisis regime and the OMT as an effective circuit breaker, which was underpinned by the political agreement to move towards a European Banking Union. According to their empirical analysis, the reversion of sovereign bond spreads to the non-crisis regime took one year to complete after the reassuring commitments of summer 2012. This market stabilisation also reflected progress made by crisis-hit euro area countries with reforming their economies, which improved their fundamentals. Wiegand (2017) finds that meanwhile investors have awarded euro area countries again with an interest-rate bonus for their EMU membership, estimated at half the size of the pre-crisis premium. But market participants continue paying attention to country-specific risks, such as a high public debt and large external liabilities. Also, sovereign credit ratings have not yet moved fully back to their pre-2008 levels.

4.2.3   The returning home bias in the government debt of euro area countries

A key objective of public debt managers is to establish a stable and diversified pool of investors, as this offers the securest source of financing against the lowest possible costs. Along with a convergence of public debt management practices, the creation of EMU made it possible to attract investors from other euro area countries that so far had avoided exchange rate risk (Favero et al., 2000; Wolswijk and de Haan, 2005). This supported financial integration and facilitated the single monetary policy. As a result, in the first 10 years of the single currency, the share of non-residents in total government debt showed a steady rise and that of residents (excluding the national central bank) accordingly declined, especially for smaller member countries (see Merler and Pisany-Ferry, 2012 and Figure 4.4). This development was mostly accounted for by investors from other euro area countries, although non-euro area investors, including foreign central banks and sovereign wealth funds wishing to diversify the currency composition of their portfolios, also contributed.

As a remarkable consequence of the sovereign debt crisis in the euro area, this trend has gone into reverse in the crisis-affected countries (see Figure 4.4). By 2011, the share of residents in total government debt (corrected for EU/IMF support and Eurosystem outright interventions) was in their case back to the high levels seen at the start of EMU. This reversal reflected, on the one hand, the sell-off by international investors. As noted by Brooke et al. (2013) and Popov and Van Horen (2015), EU/IMF financing of distressed governments and the Eurosystem's purchases of sovereign bonds as part of the SMP may have helped foreign financial institutions to shed their exposure to troubled countries when sovereign default risks appeared to increase. On the other hand, the growing relative weight of resident investors may be related to any of the economic factors that explain the return of a 'home bias' in the demand for government debt (see Box 3.1).

Figure 4.4 – Government debt held by residents of selected euro area countries, 1999-2016

(share of residents excluding national central bank in total gross government debt, in percent)
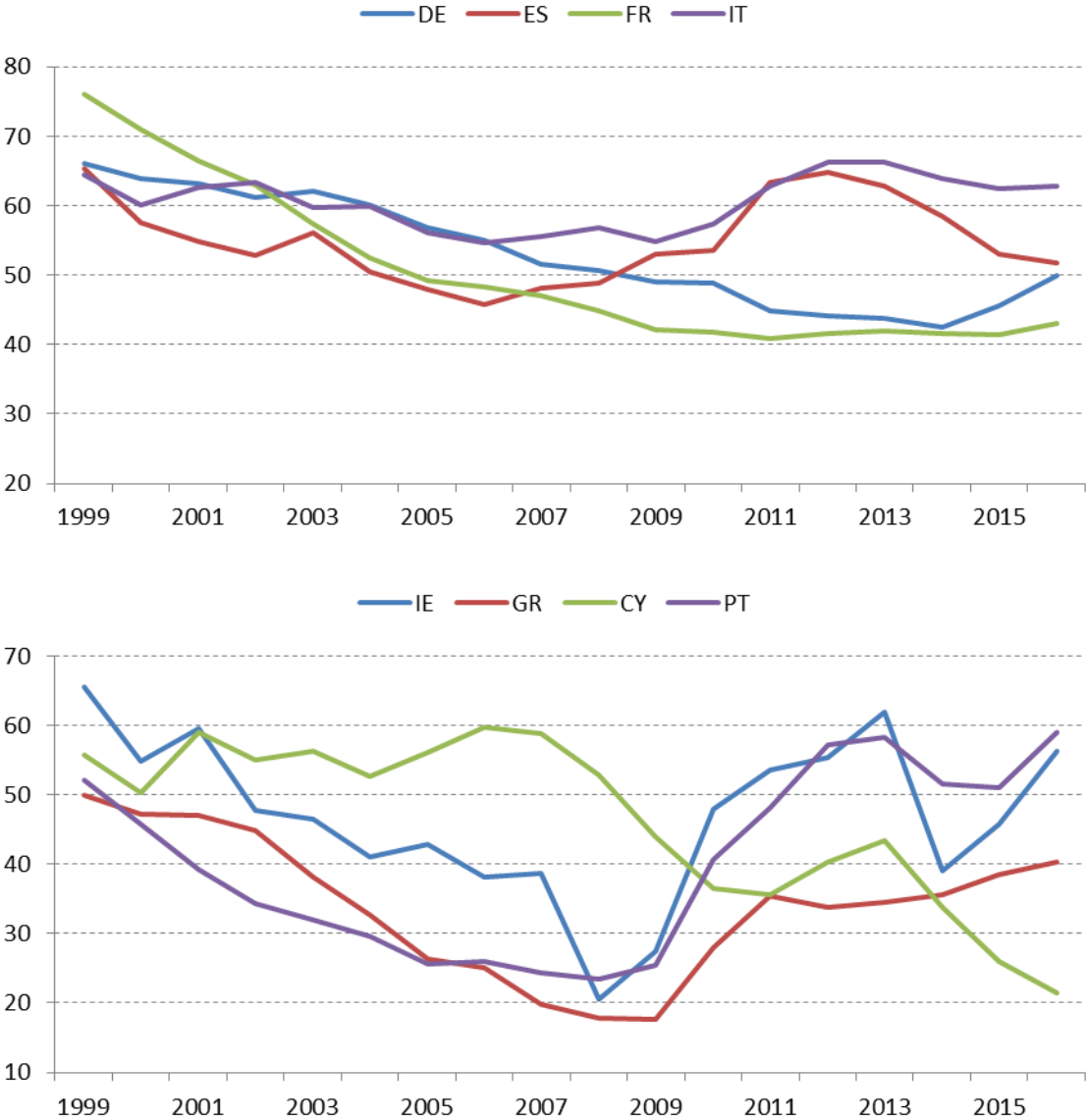
Source: European System of Central Banks and Eurostat, based as far as possible on the former ESA 1995 definition. GDP data for Ireland for 2015-16 are linked to modified GNI* to correct for large international balance sheet relocations.

Note: Total gross government debt in 2010-2016 excludes the EU/IMF loans received as financial assistance and the national government bonds purchased by the Eurosystem under the Securities Markets Programme (SMP) and the Public Sector Purchase Programme (PSPP).

The next sections examine how national treasuries and public debt managers addressed the fiscal sustainability challenges they faced by trying to steer both the supply side and the demand side of government debt markets. Some of the protective measures that (in particular, but not only) the vulnerable euro area countries took in response to the heightened market volatility and the retreat of foreign investors can be perceived as a return to financial repression.[13] The fiscal authorities

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[13] Note that in the decades after World War II until the 1980s many Southern European countries were accustomed to using state intervention in the financial system (or financial repression) as a growth strategy. See Pagoulatos (2003).

confronted with funding stress in effect called upon domestic savers and investors to repatriate their capital and function as alternative 'lenders of last resort' so as to be able to (re)finance their own debt at affordable interest rates. The benefit of this moral suasion was in the first instance that it avoided the political stigma effect of having to ask for conditional EU/IMF support. Later on, the growing share of domestic lenders to the government effectively complemented the crisis-related financing of public debt by the official sector and supported the market-stabilising SMP interventions and the OMT commitment by the Eurosystem.

4.3 Managing the supply of government debt in euro area countries

Public debt managers wishing to limit the vulnerability of the fiscal position to changing market conditions will in any case actively manage debt supply. Responding to the financial crisis, they initially moved away from standard debt issuance practices (focused on fixed-rate euro-denominated instruments with a long maturity) and assumed additional 'non-standard' exposure (De Broeck and Guscina, 2011). As sovereign bond markets became very volatile, they generally adopted more 'intelligent' public debt management techniques, with the aim of increasing market liquidity, reducing roll-over risk, limiting borrowing costs, improving cost efficiency and creating a more stable investor base (Strauch et al., 2016). The following sections describe the main challenges that public debt managers encountered in fulfilling the government's financing needs and how in selected cases these were addressed by adjusting debt supply.

4.3.1 New challenges for funding the government

The European Commission relaxed the EU state aid rules in October 2008 to formally allow the Member States to cushion the effects of the financial crisis by taking direct measures of support for their domestic banking system. Many governments raised the maximum amount of retail deposit insurance and gave liquidity support, short-term loans, capital injections, or guarantees to stabilise the systemically important banks in their jurisdiction. A number of systemic banks were nationalised. Some countries also set up 'bad banks' operating under a state guarantee. Most Member States also participated in the coordinated fiscal expansion that was launched in late 2008 as part of the European Economic Recovery Plan. As a result, the crisis-related private sector costs and risks migrated to public sector balance sheets and governments saw a surge in their gross financing needs and contingent liabilities (see van Riet (ed.), 2010; De Broeck and Guscina, 2011; Holler, 2013).

To match the demand of more risk-averse investors, most treasuries issued more debt with shorter maturities, variable interest rates, or in foreign currency, thus increasing their exposure to roll-over risk, interest-rate risk and exchange-rate risk. For example, to finance the in principle temporary financial assistance and fiscal stimulus, they borrowed in the market at corresponding short- to medium-term maturities, benefiting from the fact that money market rates had fallen and the yield curve had steepened a lot as the single monetary policy was being relaxed (see Hoogduin et al., 2011).

Later on, as the sovereign debt crisis broke out and intensified during 2010-2012, public debt managers faced new challenges. They generally refocused their strategies on limiting short-term refinancing needs by smoothing out the debt redemption profile and attracting more funds with longer tenors (see OECD, 2013). The governments in the safe-haven countries were flushed with money, which gave them the unexpected opportunity to attract short-term funds at slightly negative interest rates and low-cost financing across the whole yield curve. Creditors willingly accepted a negative real return, even when the sovereign CDS spreads of the safe countries had also risen somewhat and some of them had lost their triple-A credit rating. On the opposite side, the euro area countries with a lower credit standing by then were confronted with repeated rating downgrades and were forced to continue borrowing for short- and medium-term maturities at elevated interest rates. Equiza-Goñi (2016) presents counterfactual simulations to demonstrate that (vulnerable) euro area governments would have been better protected against rising sovereign bond yields if they would have had a longer average debt maturity at the start of the sovereign debt crisis.

Greece, Ireland, Portugal and Cyprus were successively shut out of the capital market as interest rates soared to unsustainable levels. The public debt managers of these EU/IMF programme countries looked for opportunities to resume their short-term issuance activity and smoothen out the redemption profile of sovereign bonds by switching outstanding securities with a short residual maturity for bonds with medium-term tenors. They also created a sizeable cash buffer to pre-finance most of their expected borrowing requirements for the year ahead and to gain space for adjusting debt issuance in volatile market conditions. This strategy prepared the way for them to re-enter the capital market (see Strauch et al., 2016). Spain, Italy and Slovenia retained market access, but their creditworthiness was under heightened scrutiny of market participants, in particular those of foreign origin, requiring extra efforts of public debt managers to ensure that debt issuance was absorbed by the market. Spain decided to apply for ESM financial assistance specifically for large bank rescue operations.

As market conditions became tougher and competition for funds stronger during the sovereign debt crisis, public debt agencies also had to undertake greater efforts to 'buy-in' investors and support market liquidity (OECD, 2013). This objective was achieved by stepping up communication to restore or stabilise confidence, attuning debt issuance conditions and procedures closer to the preferences of both domestic and foreign investors and by securing the services of a stable group of primary dealers committed to a minimum standard of liquidity provision. Where foreign lenders had pulled out, the challenge was to mobilise the financial assets of resident investors – also the part held abroad that residents could repatriate to fund their own government – and to create a more stable albeit less diversified investor base. This motivated public debt managers to target their supply more to the specific interests of domestic audiences (retail savers, banks, institutional investors) while lengthening the maturity profile of outstanding debt. As the sovereign debt crisis subsequently abated, the capital flows to safe-havens reversed to some extent. Foreign investors searching for a higher return moved back to invest again in the euro area countries previously regarded as too risky.

4.3.2 *Attuning public debt supply to domestic audiences and switching to longer tenors*

When market volatility increased, politicians of some euro area countries (for example Belgium) appealed to their *citizens* to hold on to or invest in bonds issued by the state, emphasising the vital role of their retail savings for supporting the national economy. The governments of Italy and Ireland called upon their citizens to subscribe to 'patriot bonds' and 'solidarity bonds', respectively, in order to keep retail investors on board. As many households were themselves under financial strain, such invitations to make a special contribution for their country were only a mixed success.

More effective were bond offerings that directly served the specific interests of the general public. The Belgian government was successful with a financial instrument specifically targeted at citizens. At the end of 2011, Belgium faced a period of tensions in capital markets leading to rising sovereign bond yields. As an alternative funding strategy, it invited retail investors to subscribe to state notes on conditions similar to debt securities. Through this instrument the Belgian treasury managed to cover 20% of its gross borrowing requirement for 2011 and create a more stable domestic investor base.

As another case in point, in March 2012, the Italian treasury issued four-year bonds indexed to domestic inflation, targeted at retail investors interested in a positive real rate of return. These indexed bonds included a premium for holding them to maturity. Furthermore, Portugal tried to stem the outflow of small investors to bank deposits that offered a higher return by adding a fixed premium of up to 275 basis points to the gross rate applicable to its saving certificates; it was in place from September 2012 until end-2016. In addition, it launched a new five-year debt instrument with a fixed interest rate targeted at retail investors, including a premium equal to 80% of the average rate of real GDP growth, if positive, to be paid during the 4th and 5th year (see Strauch et al., 2016).

As an important buyer of sovereign bonds, the *local banking sector* was a prime target of public debt issuers, in particular with the aim to engage them in holding longer maturities. This became apparent when the Eurosystem announced in December 2011 that as part of its longer-term refinancing operations (LTROs) it would offer banks collateralised loans in two operations for an exceptionally long maturity of up to three years and with full allotment of the requested amounts. The first of these LTROs was allotted on 21 December 2011 and the second on 29 February 2012 (see Section 4.4.1).

Although Portugal had lost its investment-grade status in January 2012, the debt management agency was able to increase the average maturity of its short-term treasury instruments. To benefit from the steepening of the Portuguese sovereign yield curve after the first allotment of the three-year LTROs, it sold a large amount of short-term high-yield zero coupon bonds to the banking sector, acting before the second of the three-year LTROs took place; banks could in turn use these treasury bonds as collateral for this LTRO (Crosignani et al., 2016). The public debt managers of other risky euro area countries adopted similar supply tactics, strategically tilting their issues to the short end of the maturity spectrum in response to the rotation and steepening of the yield curve that followed the three-year LTROs as bond yields up to three-year maturity declined while those of longer tenors increased.

As part of its expected return to the capital markets, in January 2012, the National Treasury Management Agency of Ireland exchanged 30% of an outstanding bond maturing in 2014 for a new treasury bond maturing in 2015 in order to address the funding cliff that was foreseen for early 2014, i.e. shortly after the end of the three-year EU/IMF support programme. The timing of this "opportunistic transaction" (Strauch et al., 2016, p.17) was directly linked to the introduction of the second three-year LTRO and the duration of the new treasury bond was conveniently matched with that of the LTRO (see also Hill and Bryce, 2012).

Starting in August 2012, Ireland issued new annuity bonds that paid a stream of principal and interest over maturities ranging from 15 to 35 years to match the very long-term liabilities of *domestic pension funds and insurance providers*. Early in 2013, benefiting from improved market sentiment, Ireland regained capital market access with longer-term syndicated instruments. After the successful conclusion of its three-year EU/IMF adjustment programme in December 2013, the first auction in March 2014 of sovereign bonds with a 10-year maturity attracted high demand. Bond buybacks and maturity switches further contributed to extending the average maturity of outstanding government debt. Low-cost market funding was further used for the early repayment of IMF loans as well as bilateral loans received from Denmark, Sweden and the United Kingdom, since these were more expensive than those from the EFSF (on this point see also Corsetti et al., 2017).

The Portuguese debt management agency successfully offered debt swaps in October 2012 and December 2013 whereby outstanding bonds due to be repaid in the next two years could be exchanged for new bonds falling due in the medium to longer term. Apart from smoothing the debt redemption profile, the swaps were perceived as testing the appetite of investors for its planned return to capital markets. Already in early 2013, the treasury came back with syndicated deals in the 5 and 10-year benchmark bonds. Portugal completed its three-year EU/IMF adjustment programme in April 2014. The first auction was executed in the same month with a tap of the 10-year benchmark bond, marking its successful return to the capital market. Following the example of Ireland, it also used the opportunity of lower market funding to repay loans from the IMF before they were due.

As regards Cyprus, the EU/IMF support did not cover for the repayment of a few government bonds that were due to mature during the programme period. With the consent of the main bondholders (domestic banks), the Cypriot authorities therefore launched on 27 June 2013 a voluntary exchange of EUR 1 bn. of government bonds issued under national law for new bonds with the same coupon rates and 5-10 year maturities for which market rates were actually higher. Since this debt management operation was pushed through at the expense of investors, credit rating agencies placed the country in default for about a week. Only a year later, Cyprus was back in the market with a syndicated issue. Since local investors faced financial constraints, the longer-term bonds were targeted mostly at international investors. The public debt management office instead appealed to domestic audiences with treasury bills. Cyprus exited its EU/IMF programme in March 2016 (see Strauch et al., 2016).

As Greece achieved a primary budget surplus and its market conditions turned for the better in 2014 it was briefly able to issue two syndicated bonds with 3 and 5-year maturities. These bonds were mainly absorbed by domestic banks that could use them as collateral for ECB liquidity operations, albeit at a significant haircut in view of the credit risk involved. This success was hailed as a de facto return of Greece to the capital market, even before the country had completed its second EU/IMF lending programme, but it proved temporary. After a third programme had been concluded in mid-2015 and the country's fiscal position seemed to stabilise, Greece managed to come back to the capital market again in July 2017. Holders of outstanding bonds maturing in 2019 were invited to tender them for cash and/or to exchange them for a syndicated new issue of 5-year bonds. One of the purposes was to build a cash buffer in preparation for the end of the three-year EU/IMF programme in August 2018.

4.3.3 Other innovations in managing public debt supply

Considering other debt supply innovations, several euro area countries offered new types of instruments that were targeted at increasing capital market liquidity or giving financial institutions a greater choice of instruments. In addition, measures were taken to increase cost efficiency.

France issued a big loan ('grand emprunt') in 2010 amounting to EUR 22 bn. (about 1% of GDP) which due to its large size created a highly attractive liquid instrument for investors. French bondholders may also have been motivated to subscribe to this loan out of moral responsibility, as its purpose was to help financing a large investment programme for the future ('Investir pour l'Avenir') of EUR 35 bn. (some 1.8% of GDP) that for the remainder was financed out of bank repayments of state bailout funds.

Germany started to finance from 2013 onwards a part of federal and Länder debt through jointly issued bonds, thereby creating a deeper and more liquid market, while maintaining separate liability for servicing the debt. This is a special variant of the 'jumbo bonds' whereby the Länder join their debt issuance in order to benefit from a greater market volume and a reduced liquidity premium, again on the basis of pro rata liability. The suggestion that the federal government and the Länder could together issue so-called 'Deutschland bonds' with joint liability has so far not been taken up. The averaging of credit risks would limit the borrowing costs for the Länder, but the outcome for the federal government would be uncertain as it could potentially become responsible for paying back the total amount of the bond. Moreover, an explicit pooling of debt issuance would distort the incentives for the Länder – which already enjoy an implicit guarantee – to maintain fiscal prudence.[14]

Similarly, Spanish regional governments called on the central government to issue 'hispano bonds' subject to joint liability. The pooling of debt issuance would give them the chance to benefit from the

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[14] During the euro area sovereign debt crisis, also the German Länder benefited from the safe-haven flows to Germany. This facilitated the replacement of direct bank loans by marketable bonds in their financing structure. Zipfel and Zimmer (2013) explain this new market demand (primarily coming from domestic institutional investors) by the principle of mutual support that exists between de Federation and the Länder. They argue that this implicit guarantee notwithstanding, the yield spreads recorded since 2008 between federal bonds and Länder bonds also reflected divergences in their GDP per capita and debt-to-GDP levels.

central government's lower borrowing costs. As these joint bonds would require an explicit guarantee from the central government and in return central control over the budgets of the autonomous regions, the idea has so far been rejected. The treasury has instead since 2012 increased its own funding programme to provide relatively cheap liquidity to regional governments and municipalities.

France established in October 2013 the 'Agence France Local', which offers sub-sovereign governments like municipalities, departments and regions the opportunity from end-2014 to jointly tap the capital market at relatively favourable funding conditions, in particular to finance investments. While the participating authorities would contribute to the agency's capital, they would be liable for their own pro-rata share of debt outstanding. The interest rate to be paid by them could be slightly differentiated according an internal credit rating assessment. This new financing option was already foreshadowed by earlier joint bond issues of local governments.

Some countries (such as the Netherlands) obliged regional governments and municipalities to hold their excess cash reserves on a treasury account at lower interest rates than offered by banks, which had the advantage of reducing the consolidated level of public debt. The Greek administration pushed through legislation in early 2015 that forced public sector entities (utilities, pension funds) to place their cash surpluses with the treasury through short-term repo transactions. This was one of the efforts of the central government to overcome severe liquidity stress during prolonged negotiations on payment of the last tranche of its second EU/IMF lending programme.

Some public debt agencies issued bonds in foreign currency, notably in the US dollar, to benefit from the relatively low interest rates which might still be attractive enough for foreign investors looking for a higher return. The share of (non-euro) foreign currency debt in total euro area government debt rose from 0.7% of GDP in 2007 to 2.3% in 2012 (also due to IMF financial assistance denominated in Special Drawing Rights); this share has since fallen back slightly to 2.1% of GDP in 2016.

A few countries (including Spain and Italy) also issued bonds linked to a (euro area) inflation index to attract additional demand as it enabled institutional and retail investors to hedge against future inflation risk. This followed a new development since the start of EMU (see Hartwig Lojsch et al., 2011), as a result of which the share of inflation-indexed sovereign debt in the euro area total reached nearly 5% in recent years. The implied greater vulnerability to floating-rate debt instruments was offset by a reduced issuance of variable-rate debt (see Holler, 2013).

Germany decided to close with effect from 2013 the window through which retail investors could buy federal government paper in small denominations directly from the debt management office and without further transaction fees or portfolio costs. This forced them to invest instead in larger amounts using the banking sector as an intermediary for purchases in the primary bond market. The main objective of closing this funding option was to make federal debt management more cost efficient, as the costs of dealing with a large number of small investors are relatively high. Moreover, it offered banks the chance to charge fees for their services related to federal debt.

4.3.4 *Public debt supply at ultra-long maturities*

Following the ECB's very accommodating monetary policy stance in 2014-2016 market interest rates fell to historically low levels across the board, reaching negative territory at short- to medium-term tenors while the sovereign yield curve flattened at the long end (see Chapter 6).[15] Public debt managers used the opportunity to frontload their borrowing programs and to lengthen the average maturity of outstanding debt so as to entrench the exceptionally low long-term interest rates, save on debt servicing costs and reduce refinancing risk (see Figure 4.5). Profiting from a high investor demand, they managed to issue or place 30-year bonds (several euro area countries), 50-year bonds (Belgium, France, Italy and Spain), 70 year bonds (Austria) or even century bonds (Belgium, Ireland) in 2015-2016. The corresponding upward pressure on longer-term bond yields was contained, although the low liquidity in sovereign bond markets did cause higher price volatility.

Figure 4.5 – Government debt securities issued by euro area governments, average yield
(x-axis: yield on debt securities issued over the last 12 months in December 2016 compared to May 2014; y-axis: yield on the stock of debt securities in December 2016 compared to May 2014; percentages per annum)
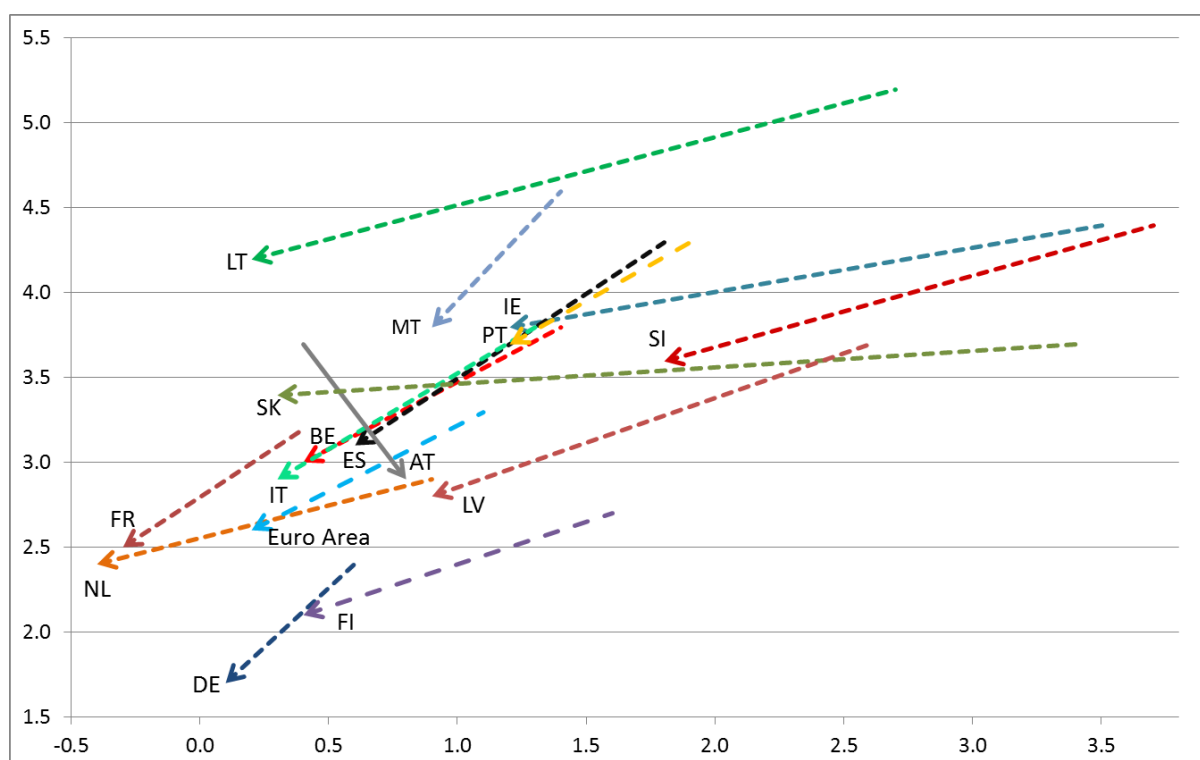
Source: ECB.

Note: National data exclude Greece, Cyprus, Estonia and Luxembourg. The deviating pattern for Austria may be related to the downgrade of its credit rating from AAA to AA and its issuance of two relatively expensive bonds with an ultra-long maturity of 30 and 70 years.

4.4 Managing the demand for government debt in euro area countries

Apart from actively managing debt supply euro area governments may also resort to actively managing the demand for their debt securities, notably by exercising financial repression. This strategy of exploiting the borrowing capacity of resident investors could help to secure funding at concessional price and quantity conditions, in particular at times when the free functioning of markets is considered to lead to undesirable or unsustainable outcomes. When solvency is at stake, governments may even decide to use their sovereign powers for 'exceptional' debt resolution operations in order to restore public debt sustainability. As is evident from the selected cases discussed in Section 4.4.1, several euro area governments have actively interfered in the flow of credit and the stock of wealth to facilitate public debt management and restore fiscal sustainability. Over the longer term, savers and investors are likely to hedge against repressive government practices, both by reducing their participation in regular sovereign debt auctions and/or demanding a higher risk premium. In addition, they may decide to move into the shadow economy or abroad in search of market-based higher returns. This could require governments to intervene even more forcefully in order to maintain captive markets and affordable interest rates. Section 4.4.2 therefore reviews the option of mandatory loans and capital levies.

4.4.1 Selected cases of financial repression by euro area countries

This section discusses selected public sector interventions in the national financial system which could be interpreted as signalling financial repression of savers, banks, pension funds and other market participants with the general objective to relieve the financial pressure on their sovereign or allow politicians to direct credit to preferred domestic borrowers (see Table 4.3 for an overview). The fiscal motive was, in particular, to fill budget holes, prevent expensive new bank rescues, direct domestic lenders to government securities, or to cut an unsustainable public debt overhang. Not only troubled euro area countries, but also safer euro area countries facing rising public debt sometimes favoured certain forms of financial repression.

Table 4.3 – Selected cases of financial repression in euro area countries

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1. Exploiting domestic banks

a. Moral suasion of banks to hold on to Greek government bonds following an agreement among Eurogroup Finance Ministers (all euro area countries)

b. Moral suasion of banks to increase their holdings of domestic sovereign bonds during times of high government (re)financing needs (several vulnerable euro area countries)

c. Moral suasion of banks to take advantage of cheap ECB liquidity offered at exceptional three-year maturity and to park this in own government bonds (several vulnerable euro area countries)

d. National supervisory practice that allowed local banks to convert deferred tax assets into deferred tax credits to make it easier for them to meet the minimum capital ratio and avoid state-financed bank rescues (GR, PT, ES, IT)

e. Supervisory pressure on banks to withdraw their foreign assets in the vulnerable countries or to repatriate funds held in subsidiaries/branches in the safer countries (most, if not all euro area countries)

Following the outbreak of the euro area sovereign debt crisis in late 2009 the financial sector in most of the vulnerable countries increased the 'home bias' in its sovereign exposure (see Figure 4.4). On the one hand, this repatriation of investments may be regarded as a profit-maximising response to the emerging risk-adjusted yield differentials relative to non-performing loans to the private sector, the wish to match assets and liabilities on a national basis as a hedge against a potential break-up of the euro and the attractiveness of own government bonds as a relatively liquid instrument (Banca d'Italia, 2013; Angelini et al., 2014). On the other hand, for weakly-capitalised banks in particular this trend may initially also have reflected an opportunistic portfolio reallocation towards the more risky but higher yielding bonds of their own country (Battistini et al., 2014; Acharya and Steffen, 2015; Drechsler et al., 2016). This risk shifting at the expense of bank creditors appeared to be an attractive strategy given the relatively low cost of unlimited ECB refinancing and the ability to pledge riskier

sovereign collateral albeit at a larger haircut. Yet, this profitable 'carry trade' lost much of its attractiveness after the leaders of Germany and France in October 2010 called for a 'private sector involvement' in the restructuring of sovereign debt for euro area countries asking for official financial assistance. Moreover, in autumn 2011 the European Banking Authority (EBA) recommended national bank regulators to demand an exceptional and temporary capital buffer against the evident risks associated with their government bond exposures, irrespective of the regulatory capital risk-weight of zero applied to claims on the government. As a result, crisis-affected countries had to look for alternative ways to secure their financing needs.

1. *Exploiting domestic banks*

Many domestic banks became reportedly subject to *moral suasion and political pressure* by their governments, both to continue financing the economy and to hold on to the bonds issued by their own sovereign. Ongena et al. (2016) find empirical evidence suggesting that governments may have used moral suasion during times when their public debt management offices had to roll over a substantial amount of outstanding debt or finance a high budget deficit. Their study focuses on the sovereign crisis periods of May 2010 to August 2012 for Greece, Ireland and Portugal and of August 2011 to August 2012 for Italy and Spain. During months of large sovereign (re)financing needs domestic banks appear to have bought much more bonds from their own government than foreign banks. This finding was strongest for state-owned banks and for commercial banks with a low initial exposure to their sovereign. These domestic banks may have colluded with their government to act as 'buyers of last resort' to stabilise the market in times of fiscal stress.

Becker and Ivashina (2014) also report that state ownership of banks and government influence over the board of bank directors are important channels of financial repression in these countries. As banks were under pressure to buy government bonds, the larger non-financial firms had to shift their funding strategy from acquiring bank loans to issuing bonds in the capital market. Similarly, De Marco and Macchiavelli (2016) observe that banks under political control, especially those that were recapitalised by the state, significantly increased their exposure to domestic sovereign bonds in the euro area countries that were most affected by the crisis.

Mésonnier and Monks (2015) find that the EBA recommendation that banks should raise their capital ratios as a precaution against sovereign risk led the EBA, the EU Council, national supervisors as well as national politicians to urge the banks with a capital shortfall to continue their domestic lending activities and avoid a shedding of risk-weighted assets; they were advised instead to raise fresh capital and manage their liabilities more efficiently. An enforced credit crunch in the private sector could evidently lead to a recession and reduce the ability of countries to grow out of their high debt, while banks cutting the exposure to their own governments could intensify the high capital market volatility seen in end-2011/early 2012.

This empirical evidence is consistent with the political call on banks to take advantage of the ECB's exceptional offer of LTROs with a three-year maturity in late December 2011 and end-February 2012

and to park these cheap funds in higher-yielding sovereign debt (Buiter and Rahbari, 2012). After the ECB's announcement, French President Nicholas Sarkozy told reporters: "This means that each state can turn to its banks, which will have liquidity at their disposal".[16] Provided that they had sufficient eligible collateral, solvent banks with access to ECB refinancing could borrow cheap and lend the acquired funds on to their sovereigns for three years at a much higher interest rate and pocket the spread. With this so-called 'Sarkozy carry trade' the banking sector could moreover acquire fresh collateral that in turn could be pledged in the second three-year LTRO, although the ECB applied a graduated valuation haircut to account for the sovereign credit risk. As pointed out by Crosignani et al. (2016), domestic government bonds of short maturity were the perfect high-yield security for banks to engage in this collateral trade. The attractiveness of this credit operation was evident from the allocation of about EUR 1 trillion in gross terms, "the largest liquidity injection in the history of central banking". The interest rate was fixed ex post at the average rate applied to the ECB's main refinancing operations over the lifetime of the LTROs (which at that point in time stood at 1.0%).

The banking sector in several countries appears to have followed Sarkozy's call and engaged in a profitable carry trade, in some cases with explicit support from their own governments. This trading strategy also helped banks to meet the EBA's higher capital requirement through generating extra profits rather than by cutting their lending to the economy. For example, as shown by Crosignani et al. (2016), Portuguese banks with access to ECB refinancing first bought a significant amount of short-term zero-coupon bonds conveniently offered by the treasury in early 2012 and then pledged them as eligible collateral in the second LTRO to get cheap central bank funding with a maturity of three years. Consequently, the ECB's monetary policy operations indirectly financed the crisis-hit governments and intensified the sovereign-bank nexus. The post-LTRO decline in sovereign yields was effectively a bank recapitalisation by stealth. However, this benefit was short-lived as the sovereign debt crisis flared up again in spring 2012 when the Spanish government had to find a way to finance the high costs of rescuing a troubled banking sector.

The case of Italy is more complicated. After the European Commission in the summer of 2011 had extended the temporary relaxation of state aid restrictions, allowing Member States to support their weakened banking sectors, the Italian government issued a Decree Law in December 2011 (which became law on the day after the first of the three-year LTROs was allotted) that gave resident banks with sufficient capital the option to obtain a state guarantee on specific debt liabilities against a fee of about 1.0% (see Carpinelli and Crosignani, 2016, for details). The purpose was to reactivate the medium- and long-term financing capacity of the banking sector. Many Italian banks, especially those that in the previous months had lost access to funding in the foreign wholesale market, used this opportunity to 'manufacture' eligible collateral that could be pledged for the second of the three-year LTROs. They achieved this by issuing new government-guaranteed bank bonds but retained these on

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their balance sheet for own use as collateral with the ECB (a loophole that the ECB phased out as from March 2015; see Bindseil et al., 2017). A large number of state guarantees were thus attached to bank bonds issued by Italian credit institutions with a lack of wholesale funding. The number of state guarantees rapidly rose from almost zero to more than 250 in the weeks before end-February 2012, the date of the allotment of the second three-year LTRO (see Figure 4.6 and Nyborg, 2017). The beneficiary banks subsequently posted part of these government-guaranteed instruments as eligible collateral with the ECB and so managed to get a very substantial amount of liquidity in the second of the three-year LTROs.

Carpinelli and Crosignani (2016) find that these central bank loans relieved bank funding pressure in Italy and were then mostly used to finance bank credit supply, as was the original intention. By contrast, those credit institutions that had less funding problems, as well as large banks and banks with more non-performing loans, placed the extra central bank liquidity to a large extent in Italian government bonds.[17] Figure 4.6 suggests that credit institutions in other euro area countries may also have issued government-guaranteed bank bonds to use them as eligible collateral in ECB refinancing operations.

Figure 4.6 - Bank bonds guaranteed by central government

(percentage of the national banking system's liabilities)
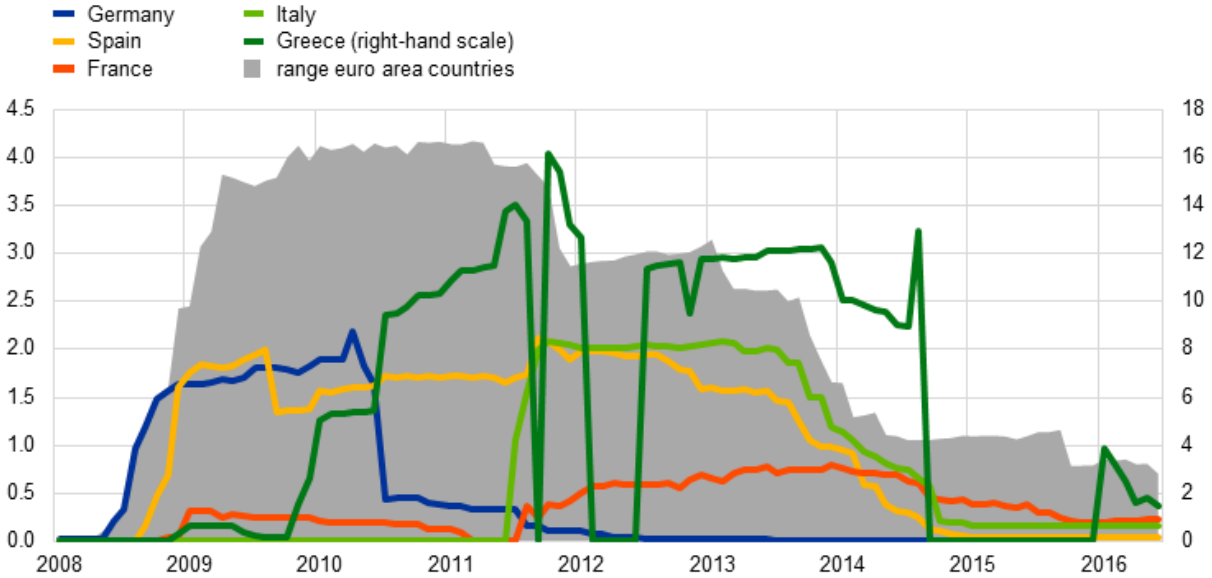
Source: ECB, as reported by Bindseil et al. (2017, Figure 9). Last observation: December 2016.

Notes: The grey range includes Austria, Belgium, Cyprus, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Slovenia and Spain. Data include bonds issued by credit institutions, excluding public banks which have always enjoyed a public guarantee. The higher range (grey area) between 2010 and 2012 is explained by the Slovenian time series (not shown separately in the chart). An increase in Belgium during 2015-2016 is due to a single issuer (i.e. due to an idiosyncratic factor) and is therefore excluded from the range.

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[17] According to Banca d'Italia (2013), the large purchases of general government securities by Italian banks were concentrated on residual maturities between 1 and 5 years. They could be explained by the need to temporarily invest the funds acquired through the two LTROs, also reflecting return differentials and banks' balance-sheet conditions. A negative impact of these government bond purchases on private lending could not be established.

The success of this 'Sarkozy carry trade' was evident from the large take up in the two three-year LTROs (which as mentioned above amounted to about EUR 1 trillion in gross terms), notably by banks in Spain and Italy[18], and the substantial government bond purchases by credit institutions in the vulnerable countries around the same time. Short- to medium-term sovereign bond yields fell and the yield curve steepened at the longer end. This price reaction helped governments, at least temporarily, to fund themselves in liquidity-constrained markets and at more sustainable interest rates. For undercapitalised banks with more limited resources the shift towards funding their own government reduced the supply of credit to private borrowers (van der Kwaak and van Wijnbergen, 2017).

The fact that this central bank liquidity partly ended up with governments rather than as credit to the private sector was one of the reasons for the ECB to start with targeted longer-term refinancing operations (TLTROs) as from September 2014. These were conditional on banks using the borrowed funds allotted at the main refinancing rate with maturities of up to four years for increasing the supply of credit to the private sector (excluding loans for housing purposes). As the conditionality was rather weak, a part of these central bank funds was still directed to sovereign bonds with a higher return to profit from a carry trade. Yet, banks that were found not to have met the conditions were required to return the acquired central bank money. The success of the first programme motivated the ECB to announce a second TLTRO programme of four quarterly tenders starting in June 2016. This allowed banks that met the conditions to acquire central bank funds for four years at a fixed interest rate of up to the deposit facility rate of -0.4%. This subsidy must also be seen as a compensation for the 'tax' rate of -0.4% imposed on banks holding excess liquidity on the ECB's deposit facility (see Section 6.7.4).

Greece, Portugal, Spain and Italy also applied an overly lenient national practice of recognising core capital in banking supervision that permitted resident banks to *convert deferred tax assets into deferred tax credits*. The advantage for the government was that this practice exaggerated the financial strength of the banking sector and helped to avoid further bank rescue operations to be financed by the state. As from January 2014, EU banking legislation progressively phases out deferred tax assets (arising for example from losses on non-performing loans that cannot be deducted from current taxable profits and can only be offset against future tax obligations) from the calculation of core capital, because they cannot be fully relied upon as a loss-absorbing capacity. National regulators of the four countries allowed the banks in their jurisdiction to transfer their deferred tax assets into deferred tax credits, i.e. a direct claim on the government which counts towards meeting the required capital ratios regardless of whether the bank makes a profit or a loss. After studying the legality of this practice, the European Commission in November 2016 reached agreement with the four countries concerned to put an end to this distortion.

Credit institutions in the euro area were, at least temporarily, affected by *repressive prudential measures*, affecting the cross-border provision of banking services. Several national supervisors in the

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[18]   The Deutsche Bundesbank (2013) noted that these sovereign bond purchases took place alongside a reduction of direct bank loans to the Spanish and Italian governments.

safer euro area countries urged the banks in their jurisdiction to reduce their foreign exposure to vulnerable euro area members and a potential break-up of the euro and thus to reverse earlier cross-border capital flows. At the same time, regulators in distressed countries encouraged the banks under their supervision to repatriate funds held in foreign subsidiaries or branches.[19] This in turn triggered reactions from the authorities of some affected host countries seeking to preserve these bank assets and to secure the availability of bank funds for local borrowers. A survey conducted by the European Commission (2015) confirmed that some national banking supervisors introduced such 'ring-fencing' practices between 2008 and 2013.

On the one hand, the promotion of a 'home bias' by national regulators may be defended on prudential grounds. The prudential actions were targeted at preserving the health of the domestic banking system and the stability of national financial markets. On the other hand, "some of the measures raised questions about their appropriateness and proportionality in relation to the prudential concerns they were designed to address" (European Commission, 2015, p. 27). They had the effect of creating disguised liquidity and capital barriers inside the eurozone, protecting domestic banks, supporting a captive resident investor base for government bonds and securing the availability of local credit at a time when banks were under pressure to deleverage their balance sheets.

This prudential repression contributed to a fragmented euro area financial market and in the longer run could hamper the efficient allocation of savings across EMU. Moreover, it further tightened the financial nexus between governments and the banks in their jurisdiction. As experienced in the eurozone, in stressed market conditions, this close relationship triggered a vicious circle between countries with a weak fiscal capacity and their troubled banking sector, with systemic consequences for the whole monetary union. The establishment of the main pillars of a European Banking Union in 2014/15 with a single rulebook, a single supervisor and a single resolution mechanism, should break this close embrace. In addition, the EU authorities have taken initiatives towards a Capital Markets Union with harmonised financial legislation and non-bank funding. This more centralised financial governance could also restore the efficiency of financial markets in allocating funds across EMU.

2. *Exploiting retail savers*

According to an inventory undertaken by iff/ZEW (2010), about half of the Member States of the EU *apply regulatory controls to consumer lending rates,* although their methods and the extent of intervention vary considerably. The historical roots can be found in the long-standing moral aversion against usury. Their general purpose is "to ensure that consumer credit markets function well and that they promote the social welfare of people by means of appropriate and adequately priced credit products" (iff/ZEW, 2010, p.III). Yet, a ceiling placed on loans to subsidise borrowers which prevents banks from recovering their costs will lower the feasible interest rate on saving deposits. This will tilt the allocation of retail savings towards the state for those households that prefer a higher return.

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[19] Uhlig (2014) offers an analysis of the regulatory incentives that can be seen as a model of this specific form of financial repression.

Most of these interest rate restrictions in the context of consumer protection have been in place for many years but in some euro area countries new initiatives were taken. The sharp rise in variable interest rates on household mortgages in the wake of the financial and sovereign debt crisis caused a 'mortgage crisis' in Ireland, related to a lack of competition among lenders. This has motivated proposals for a bill conferring powers on the Central Bank of Ireland to address competition failures in the mortgage market for principal dwellings and enforce a cap on variable mortgage interest rates. The ceiling could be based, for example, on admissible lending margins above the cost of funds or above a rate set by the ECB. The ECB and several national authorities including the Central Bank of Ireland delivered a negative opinion on the draft bill (see ECB, 2016).[20]

Examples of the *regulation of savings remuneration* for public policy purposes can be found in France, notably in respect of the 'livret A' savings account. The livret A is a short-term savings instrument offering a relatively high administered tax-free remuneration rate. Credit institutions collect the livret A savings and transfer about 60% of the total amount to a central fund that finances social housing and to some extent small and medium-size enterprises (SMEs). The above-market remuneration available on the livret A is used on the one hand to preserve the purchasing power of household saving deposits and on the other hand to attract sufficient private savings that can be directed at affordable costs to politically supported borrowers. The livret A remuneration rate also affects the preferential return on a range of other saving accounts to which public priorities are attached, such as savings for collective pensions, owner-occupied housing and sustainable growth.

Spain offers a case of *moral suasion* to support the financial position of its ailing saving banks ('cajas') which had fallen into trouble due to non-performing mortgage loans. Spanish retail savers were persuaded to participate in the stock market listing of saving banks as the government tried to engineer a soft landing for the banking sector after the real estate crisis (see Dübel, 2013). Attracted by relatively high interest rates and lured by the government into believing that their money was safe, retail clients accepted offers made during 2009-2011 to invest in new preference shares (a hybrid of debt and equity) and subordinated debt. This provided existing stakeholders as well as the government with more protection against future losses. A little later, in spring 2012, many saving banks faced insurmountable financial difficulties and the shareholders and subordinated debt holders – many of whom were households – had to accept vast losses as a condition for the banks to receive financial support from the ESM (via the government-controlled agency called FROB). This resulted in an avalanche of lawsuits by retail clients over saving banks giving misleading information when selling hybrid and subordinated debt to their customers. Similar cases occurred in some of the other euro area countries.

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[20] The ECB made clear in its legal opinion that in general it is not in favour of the regulation of interest rates charged by credit institutions, mainly because it diverges from the principle of an open market economy with free competition, presents challenges for the efficient transmission of monetary policy and may entail risks for financial stability. For the same reasons, the ECB is generally not in favour of the regulation of savings remuneration, such as exists in France.

Furthermore, in the summer of 2011, Spain put in place what was de facto *an interest rate ceiling on bank deposits* (see also Reinhart, 2012). The aim of the rate cap was to defuse a damaging price war between banks desperately looking for funds; but the regulation could of course also be expected to induce savers to hold government bonds instead. Savers responded by pulling money out of their bank accounts, as they became increasingly nervous about the banking industry's health. As a result, just one year later, the government was forced to repeal the cap on deposit rates.

The Spanish authorities further used the *financial resources of the retail deposit guarantee fund* for bank recapitalisation purposes. As pointed out in the legal opinion of the ECB (2013), the purchase of equity shares in non-listed banks could conflict with the prudential requirement for the deposit guarantee fund to maintain a highly liquid asset structure. This shows how retail savers can easily get trapped as a consequence of financial repression and the security of their deposit guarantee can be undermined.

The Italian treasury offers *tax exemptions specifically related to sovereign bonds* which can be viewed as facilitating government debt financing. First, citizens are free from paying taxes on their interest revenues from national government bonds, which offers a preferential treatment compared to debt securities issued by the private sector. Second, their holdings of Italian government bonds are exempted from the Italian inheritance tax. This exemption was extended in 2015 to all government bonds and securities issued by Member States of the European Union to ensure equal treatment for tax purposes.

3. Exploiting domestic pension funds and insurance corporations

Also pension funds in euro area countries were confronted with various forms of financial repression, ranging from moral suasion to regulatory pressure, portfolio restrictions and fiscal engineering.[21] Given their large pension reserves, governments under stress were looking for ways to mobilise these long-term financial assets. Apart from being forced to contribute to filling budget holes, pension funds were nudged into investing more 'at home' and in government bonds, infrastructure, non-performing bank loans and the housing market.

In the context of its EU/IMF programme, Ireland *diverted EUR 17.5 bn. of the assets of its National Pension Reserve Fund* for the purpose of recapitalising troubled banks. As a successor, the Ireland Strategic Investment Fund was established in end-2014; it received a mandate to divest its global assets until 2020 in favour of investments in projects and companies which are expected to specifically bolster the Irish economy. Moreover, the Social Welfare and Pensions Act was changed in October 2011 to allow occupational pension funds (with their support) to *purchase on behalf of their pensioners sovereign annuities* paying an annual stream of principal and interest linked to high-yielding long-duration Irish sovereign bonds. The credit risk on these assets is carried by the pensioners. The liabilities associated with the sovereign annuities are to be discounted against the

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[21] Similar examples can be found in non-euro area EU countries, see Reinhart (2012).

corresponding Irish bond yield instead of the lower return on German government bonds which were previously used as the relevant risk-free asset. The pension funds were also *required to maintain a 15% reserve against their equity holdings*. Taken together, this change of legislation made it much more attractive for Irish pension funds – in particular those with a funding gap – to invest in the amortising bonds that the Irish government started to issue in August 2012 (see Section 4.3.2). In addition, the government planned a 0.5% *levy on private pension funds* to finance job creation schemes.

Portugal *transferred the reserves* of the Portuguese Telecom pension scheme (EUR 2.8 bn.) to its own budget to reduce its 2010 deficit by 1.5% of GDP. In addition, Portugal arranged in 2011 the partial transfer of the accumulated assets of private banks' pension funds (valued at 3.5% of GDP) to the pay-as-you-go social security system. In return, the government took over the associated future pension obligations from the banks. While the capital transfer received reduced the general government deficit in 2011, the corresponding future pension liabilities remained 'hidden' because in line with the then applicable European System of Accounts (ESA) 1995 they were not recorded in the current government accounts. This unbalanced statistical approach has been corrected – also for cases that occurred in the past – with the introduction of the ESA 2010, as a result of which such fiscal engineering is no longer attractive.[22]

Furthermore, as part of its EU/IMF programme, the Portuguese government *instructed the social security financial stabilisation fund* in 2013 to invest up to 90% of its portfolio in the country's government bonds, after the previous maximum of 55%. The consequence for the stabilisation fund would be a move away from the relatively safe assets of other OECD countries towards Portuguese bonds with an evident default risk. This political decision was contested by associations of pensioners.

The Spanish authorities also benefited from *changes made in the investment strategy of its social security reserve fund*, which reduced its holdings of triple-A debt to the favour of Spanish government bonds. While in 2007, the reserve fund had placed about 50% of its assets in Spanish government bonds, this share had increased to 97% by end-2012. This helped the government to fund itself during episodes in 2011-2012 when bond markets were very volatile, but exposed the social security reserve fund to the risks from a highly concentrated investment structure.

As pointed out by Reinhart (2012), in 2010, France adjusted the law with the purpose of *changing the process of liquidating a pension reserve fund*. Instead of obliging it to make long-term payments after 2020 to the French pension system the fund is now required to make annual payments from 2011 onwards to a government agency that amortises social security debt. The investment strategy of the pension fund also has to allocate more of its assets to French sovereign debt rather than to equity.

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[22] From September 2014 onwards, a transfer of pension assets is counterbalanced by the corresponding transfer of pension liabilities and recorded as a financial transaction without an effect on the government budget balance if it is actuarially fair. Should the government deliberately enter into an unequal transaction with private firms, for example, when the value of the pension assets it receives is lower than the pension obligations it takes over, the negative gap is to be recorded as a capital transfer (like an unrequited gift) to the company concerned. For details, see Eurostat (2013).

Policymakers in Italy were keen to mobilise retirement savings and called upon domestic pension funds to increase their financing of the state, in particular when foreign investors retreated. This *moral suasion* in talks with pension funds in 2013 raised concerns that directing an even larger amount of the pension funds' assets towards Italian government bonds could hurt their future ability to pay an adequate pension to scheme members. Another case of moral suasion came when the Atlante Fund was set up in 2016 to invest in the non-performing loans of weak Italian banks, enabling them to clean up their balance sheets. Private investors in the Atlante Fund were offered an annual return of 6% and politicians solicited pension funds to participate. Many of them were understandably reluctant to assume the attendant high risks. They instead favoured investments in domestic private assets, such as equity of SMEs supported by fiscal incentives. The new individual retirement plans that were introduced in Italy in 2017 are part of the government's efforts to channel household savings to the domestic economy, making this attractive through a tax exemption on the financial income and capital gains realised on equity or debt instruments issued by companies and SMEs located in Italy.

Dutch politicians also developed a keen interest in the portfolio allocation of institutional investors, looking for ways to *induce them to place more of their assets at home*. Academics proposed to split off the deferred income tax claim accumulated in occupational pension funds' reserves (estimated at about 40% of GDP when applying a tax rate of 30%). This hidden public sector asset could be used by pension funds to take over part of the household mortgage portfolio from banks so as to reduce their high loan-to-deposit ratios. The Dutch government instead planned in September 2013 to enable banks to securitise their new government-guaranteed household mortgages and transfer these to a National Mortgage Institute (NHI) that would finance itself by issuing government-backed mortgage bonds. These mortgage bonds would have the character of government debt and as such be an attractive high-quality and liquid marketable instrument for both domestic and foreign institutional investors. While the government would face additional explicit contingent liabilities, it could be expected to benefit indirectly from a sounder financing structure of the banking industry and a revival of the depressed housing market. Although the NHI proposal met with great interest from both banks and institutional investors, the parties involved could not agree on how to meet the strict condition demanded by the European Commission: the banking sector would have to pass on the full benefits realised through NHI financing to their customers, as otherwise it was unintended state aid. As a consequence, the Dutch government cancelled the project in September 2015. Meanwhile, local institutional investors have started themselves to supply long-term mortgage loans to Dutch households, thus recycling some of the mandatory occupational pension savings directly into the national housing sector.

4. *Taxing finance and constraining securities markets*

Since the financial crisis, many Member States have introduced taxes on finance to counter excessive speculation and/or bank levies to fill bank resolution funds (Devereux et al., 2015). France (in August 2012) and Italy (in spring 2013) have put in place a modest *tax on selected financial transactions* applicable to transfers of ownership of the shares of companies with a market capitalisation exceeding

a threshold, transactions in derivative instruments, and to high-frequency trading in all these financial instruments, while exempting government (and other) debt securities. This anticipated the proposal for a European financial transactions tax (see Section 5.3.1).[23]

France also started to *tax purchases of uncovered credit default swap contracts in EU sovereign bonds*, which stimulates resident investors to actually hold the underlying government instruments. This pre-empted an EU regulation that prohibits with effect from November 2012 uncovered positions in sovereign credit default swaps (CDS) in view of their speculative nature (see Section 5.3.2).

As the financial crisis erupted several euro area countries introduced emergency measures to counter 'excessive' speculation by announcing a *temporary restriction or ban on short-selling* in certain market segments.[24] Following the collapse of Lehman Brothers in September 2008 many national authorities introduced short-selling restrictions that applied until well into 2009 to dampen the decline in stock prices, in particular for banks. Examining the impact of the short-selling bans around the world over the period January 2008 to June 2009, Beber and Pagano (2013) find that they disrupted market liquidity, slowed down price discovery and failed to support prices. Their conclusion is that the costs outweighed the benefits.

As the sovereign debt crisis broke out in Greece and soon contaminated several other vulnerable euro area countries in the spring/summer of 2010, European and national authorities prohibited naked short-selling transactions in euro area sovereign debt securities to support the affected bond prices and counter the unusual volatility in capital markets. For example, the German Federal Financial Supervisory Authority kept the relevant general decree in place from 18 May to 27 July 2010 and explained that naked short-selling on a massive scale (possibly reflecting market manipulation) would result in excessive bond price movements and could jeopardise financial stability.

As the sovereign debt crisis intensified in August 2011, markets became seriously concerned with the health of banks holding substantial exposures to their own government, as witnessed by declining bank equity prices and rising bank CDS spreads. Responding to this market volatility, France, Italy, Spain, Greece and Belgium again temporarily banned all short selling in their financial stocks to counter what these countries saw as excessive speculation against their vulnerable banks. Faced with renewed turmoil in bank equity markets, Italy and Spain reinstated these prohibitions in July 2012 while at that time they were still in place for Greece.

A new EU regulation introduced with effect from November 2012 a harmonised framework for imposing short-selling restrictions in Member States (see Section 5.3.2). This gave the European Securities and Markets Authority (ESMA) inter alia the competence to coordinate national short-selling restrictions as one element to ensure the proper functioning of European financial markets.

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[23] Belgium and Greece already had a financial transactions tax in place for some time.

[24] Short-selling is the practice of investors to sell borrowed securities (including sovereign bonds) with the intention to cover their positions later by repurchasing them at a lower price. This draws concern from regulators, as short-selling is seen to artificially drive prices to lower levels and spur market volatility during a crisis.

Following positive ESMA opinions, Spain and Italy extended their short-selling bans for shares of fragile credit institutions until in 2013. Italy again had to apply for such short-selling restrictions in autumn 2014 until early 2015 and in the summer of 2016. Greece also received a positive ESMA opinion for its temporary ban on short-selling of shares in vulnerable banks from late 2012 until July 2013 and again during renewed market turmoil in June 2015 (along with the introduction of capital controls).

All these national interventions were aimed at restoring stability in financial securities markets and to allow for an orderly bank restructuring and resolution process. At the same time, they also reflected efforts from weakened governments to avoid that they would have to step in again to rescue their fragile banks with public money – although in some cases the political pressure to rescue savers from being bailed-in was high.

5. *Bailing in official lenders and expropriating investors*

Greece and Cyprus had to resolve their public debt overhang by imposing more forcible measures upon private creditors involving a haircut, debt swap, debt buyback, debt maturity extension and/or debt restructuring. The solutions to return to sustainable public finances also involved efforts of bailing in official lenders as well as the expropriation of certain categories of bank creditors.

The case of Greece offers several examples of *moral suasion and political pressure* on investors, which later was combined with more forceful repressive acts. As Greece lost market access in spring 2010 and received its first EU/IMF financial support package, the Eurogroup Finance Ministers called on their domestic banks to share the funding burden and encouraged them to hold on to the bonds issued by the Greek government (see Bastasin, 2015).[25] In addition, Greek banks absorbed a large amount of sovereign debt. These investments were initially also attractive for the domestic banks, because of the regulatory risk weight of zero applied to euro-denominated government bond holdings. The fact that the Eurosystem (outside EU/IMF programme negotiations and default episodes) continued to accept Greek marketable debt instruments as collateral (albeit with a larger haircut reflecting the higher credit risk), made it attractive for banks to organise a 'carry trade' between their low short-term funding costs and the high yield on Greek government bonds. Still, many foreign investors opted for not rolling over their maturing Greek sovereign claims.

As the first EU/IMF programme showed an increasing funding gap in the face of a rising Greek government debt-to-GDP ratio, more coercive measures became necessary to ensure public debt sustainability. Some observers put forward the suggestion to force-feed public debt onto Greek citizens (for example Arnold, 2011). At the official level, however, thinking rapidly evolved towards implementing a Greek debt restructuring. The Eurogroup asked in June 2011 for a 'soft' *private sector involvement* to complement official resources, asking large European financial institutions,

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[25]   This is comparable to the willingness of partner countries to persuade their banks to hold on to investments in troubled member countries under the classical gold standard, as discussed by Bordo and James (2014).

representing the majority of holders, to roll over their maturing Greek government bonds on an informal and voluntary basis despite rising default risks. Just a month later, the Euro Area Summit agreed on the modalities of a private sector involvement in Greek debt restructuring in connection with a second EU/IMF programme, which was declared to be a unique and exceptional solution (see also Section 5.3.3).

Moral suasion was also applied alongside this bail-in of private bondholders. As described in detail by Zettelmeyer et al. (2013), the first offer to investors of July 2011 was to exchange their Greek government bonds issued under Greek law for safer bonds under English law and to accept collateral for their principal. Later in the year, however, it became clear that a more forceful approach was necessary to achieve a sufficient reduction of Greek debt.

Agreement was reached in October 2011 on proposing to investors a 'voluntary' bond exchange as part of a 'liability management operation' in return for substantial sweeteners, while exempting the Greek bond holdings of the Eurosystem acquired under the SMP and those in the so-called ANFA investment portfolios of national central banks. As part of the deal, the Greek authorities offered in February 2012 a debt-swap that involved an average nominal haircut of 53.5% on eligible Greek sovereign bonds (implying a net present value loss of 70-75%). For the remaining value of 46.5% investors received in exchange new Greek bonds issued under English law with a maturity of up to 30 years and short-term EFSF notes as a debt enhancement (worth 31.5% and 15%, respectively, of the face value of the old Greek bonds). The coupon on the new long-term bonds rises from 2% to 4.3% and includes for some debt securities from 2015 onwards a premium of up to 1% linked to a higher-than-anticipated nominal Greek GDP and future real GDP growth rate. Just before that debt exchange offer was made, to ensure sufficient participation of private investors, Greece had retroactively introduced a powerful collective action clause with an aggregation mechanism into its domestic law bonds, allowing it to impose new payment terms on holdouts if a two-thirds majority of investors across all bonds accepted the conditions of the debt restructuring.

Despite the many sweeteners, private bondholders were placed under considerable pressure from Greece as well as its official lenders to accept the offer of a debt-swap. In early March 2012, shortly before the deadline for the debt exchange would expire, the Greek authorities urged its banks and pension funds to participate in the proposed voluntary debt-swap, warning them of the dire consequences of an outright default if the offer could not go ahead. Moreover, they clearly stated that the holdouts that declined to participate in the deal might not be paid in full (see also Zettelmeyer et al., 2013, p.27). Other euro area governments acted in a similar way vis-à-vis their financial institutions in order to make sure that the Greek debt restructuring that was assumed to take place before signing the second EU/IMF programme would go through.[26] After the final settlement, a total

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[26] On 30 March 2012, the President of the Eurogroup issued a statement encouraging holders of eligible foreign-law Greek bonds to participate in the debt exchange and provide a further positive contribution to the sustainability of Greek debt in the interest of all stakeholders. He argued that the terms of the offer included unique elements provided by the official sector, which made the debt exchange particularly attractive compared to possible alternatives.

amount of EUR 199 bn. (or 96.9% of eligible bonds) had been restructured, showing a very high participation of private creditors. Major rating agencies subsequently judged Greece to be in default, but soon lifted that verdict.

As the financing of the second EU/IMF programme was still showing holes, Greece offered in December 2012 to buy back designated privately-held sovereign bonds at their market price in exchange for short-term EFSF notes. The auction resulted in private investors selling almost EUR 32 bn. of their remaining Greek government bonds at an average price of 33.8% of the face value. As this debt buyback operation was treated as a distressed offer for a de facto *debt restructuring*, giving investors back less value than originally promised, Standard & Poor's again placed Greece for a short time in default.

Looking back on the Greek debt restructuring of March 2012, Zettelmeyer et al. (2013) conclude that private creditors, although being forced to bear a major loss, were treated as gently as possible. They were offered exceptionally big carrots and small sticks, in order to uphold the idea of a voluntary transaction and to minimise the number of free-riding holdouts. The authors argue that Greece could have reached a larger debt relief at lower costs, if it had conducted tougher negotiations and had started these earlier. One should, however, realise that by early 2012 many foreign investors had already significantly reduced their holdings. The haircut and restructuring applied to Greek government bonds thus mostly hit resident investors (as a result of which banks had to be recapitalised with EFSF loans) and the domestic economy (which was already in a deep recession). This might explain the gentle treatment of Greece's private creditors.

Roubini (2012) also notes that private creditors got a very sweet deal, which was partly financed by the official creditors. Despite its senior status, the European official sector was repeatedly willing to restructure its claims on Greece by accepting ever-longer maturities and lower interest rates and, hence, effectively accepted losses.[27] The euro area partner countries also committed to return to Greece the interest payments that it made to the Eurosystem and the national central banks on their respective SMP and ANFA holdings of Greek government bonds as long as it complied with its adjustment programme. Since the official sector has become by far the largest creditor of Greece, holding more than 80% of its public debt, it also carries most of the risk of future debt restructurings.

The new government that took office in February 2015 insisted on a relaxation of the conditions attached to EU/IMF financial assistance and demanded a *cancellation of unsustainable official debt*.[28] During the negotiation period Greek banks could not use Greek government bonds as collateral to get ECB refinancing and became increasingly dependent on emergency liquidity assistance from the Bank

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[27] As shown in Section 5.3.2, other euro area countries receiving EU financial assistance also got significant debt restructuring benefits from the European taxpayers. To ease their burden of official debt, the partner countries granted significant concessional debt service conditions on the EFSF/ESM loans as they lengthened the debt maturities, offered grace periods for repayment and reduced the applicable interest rates.

[28] The President of the Hellenic Parliament established on 4 April 2015 a Truth Committee on Greek Public Debt. The Committee's preliminary report of 17 June 2015 concluded that Greek public debt was unsustainable, illegal, illegitimate and odious and therefore that Greece should not repay this debt.

of Greece. Although an agreement with the official creditors appeared to be within reach, the Greek government called a referendum on the question whether citizens were willing to accept the austerity and reform measures proposed by the EU/ECB/IMF in return for further financial assistance. In the meantime, the second EU/IMF programme expired on 30 June 2015 without payment of the last loan tranche, as a result of which Greece missed the deadline for a (postponed) repayment of IMF loans, thereby entering into arrears. Considering the heightened default risks, the Governing Council of the ECB decided to cap the already very substantial emergency liquidity assistance that the Bank of Greece provided to Greek banks.

The Greek authorities then had to take temporary *administrative measures in order to prevent a financial meltdown*. They announced a bank holiday and restricted ATM cash withdrawals to counter a deposit run; shut down the stock exchange so as to prevent shareholders from selling their possessions and causing a dramatic fall in equity prices; and imposed far-reaching capital outflow controls. Greek sovereign yields ratcheted up again, as market concerns about another imminent default intensified and the sovereign credit rating was downgraded. The market interest rates for other vulnerable euro area countries were only modestly affected this time, as the ECB's ongoing Public Sector Purchase Programme (PSPP) in effect capped the contagion effects.

Markets calmed down when in August 2015 Greece reached agreement with its European official lenders on a third financial assistance programme. This time, the IMF refused to join in because it judged that the Greek government's fiscal position was not sustainable without first getting debt relief from its euro area partners. The Eurogroup endorsed short-term debt relief measures in December 2016, leading to a smoother debt repayment profile and more favourable debt dynamics (ESM, 2017). As a result, the Greek government debt-to-GDP ratio is expected to be 20 percentage points lower in 2060 and its gross financing needs almost 5 percentage points of GDP less in the same year (under rather optimistic assumptions). Short-term solutions to keeping the gross financing needs below the annual benchmark of 20% of GDP (originally 15% of GDP) have become one way for the partner countries to postpone outright debt forgiveness. However, in June 2017 the Eurogroup finally agreed to giving medium-term debt relief including maturity extensions and interest deferrals to Greece after it has successfully concluded its third adjustment programme in August 2018, if an updated debt sustainability analysis based on a given tight fiscal trajectory showed that this was still necessary to keep Greece's future gross financing needs below the 20% of GDP benchmark. The Eurogroup further committed to contingency measures, if needed to ensure the long-run debt sustainability of Greece.

The Greek debt restructuring of March 2012 implied a major capital loss for debt-holding financial institutions in Greece as well as in other euro area countries, notably in Cyprus. Whereas for Greek banks a government recapitalisation fund financed by the EFSF was available, the Cypriot banks did not have such a standby arrangement. They were confronted with heavy write-downs on their holdings of Greek government debt and the Cypriot authorities were faced with the question of how to recapitalise a disproportionately large banking sector. The scale of the necessary EU/IMF assistance

would be so large relative to the size of the country that the government debt-to-GDP ratio would jump to an unsustainable level. As a result, the general idea of bailing in bank creditors and savers more strongly to make a special contribution towards solving a country's financial strains was debated extensively in Cyprus.

The governor of the central bank proposed a *special solidarity levy* of 10% on earned interest income to be maintained for three years. As the existing tax rate on interest revenues was low compared to other euro area countries this idea could have been justified. The revenues that it could generate were however much too small to be effective in reducing the scale of the EU/IMF support to Cyprus to the maximum acceptable EUR 10 bn., such that the government debt ratio could be limited to 100% of GDP in 2020.

Under pressure from its EU/IMF lenders the Cypriot authorities agreed to a much more radical solution in the Eurogroup meeting of 16 March 2013. This involved enforcing all bank deposit holders (many from Russia, Ukraine and the United Kingdom) to contribute EUR 5.8 bn. to the costs of the bank rescues by imposing *an upfront one-off stability levy* of 6.75% on all insured deposit holdings up to EUR 100,000 (the maximum under EU retail deposit insurance) and of 9.9% on uninsured deposit accounts above this threshold. As compensation, the domestic deposit holders would receive an equity stake in their banks or in future revenues from a gas field recently discovered off the coast of Cyprus. However, the national parliament rejected this 'confiscation' as being in conflict with the Constitution and in view of the detrimental consequences it would have for the attractiveness of Cyprus as a low-tax financial centre.

An agreement on EU/IMF assistance to Cyprus was nevertheless necessary to allow the country to find a solution for its two largest banks in distress (following the big haircut on their holdings of Greek sovereign debt).[29] The revised agreement adopted by the Eurogroup on 25 March 2013 therefore refocused on these two unviable banks. Apart from their shareholders and creditors it affected just its uninsured depositors: they lost all their deposits and savings in excess of EUR 100,000 held in the bank to be resolved (Cyprus Popular Bank or Laiki Bank), or their money was used to recapitalise the bank to be rescued (Bank of Cyprus) through a conversion of 47.5% of deposits exceeding EUR 100,000 into equity, implying a haircut of 52.5% (this incidentally turned large foreign deposit holders into big shareholders of the Bank of Cyprus).

The initial Eurogroup agreement of 16 March 2013 demonstrated the ease with which expropriation of insured savings was embraced as a solution to a combined fiscal and banking crisis. The revised statement of 25 March 2013 agreed with the Cypriot authorities to protect bank deposits up to EUR 100,000. To restructure the Cypriot banking sector, however, bank deposits in excess of this maximum were either wiped out or their value was substantially reduced. This contrasted with the political commitment of the European Council in October 2008 "that in all circumstances the necessary

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[29] One alternative solution to establish a special public fund that would collect financial assets and property from rich citizens, the church and future gas revenues was considered to be unrealistic and rejected.

measures will be taken to preserve the stability of the financial system, to support the major financial institutions, to avoid bankruptcies and to protect savers' deposits". Moreover, Article 17 of the Charter of Fundamental Rights of the European Union protects the right to property of citizens. A confiscation of their possessions is only allowed if this is in the public interest and subject to fair compensation.[30]

Some persons therefore contested the Cypriot bank restructuring before the European Court of Justice as a breach of their right to property and appealed for compensation for the damages that they had suffered. The European Court of Justice (ECJ, 2016) dismissed these appeals on the grounds that the interventions agreed in the Eurogroup meeting of 25 March 2013 corresponded to "an objective of general interest pursued by the EU, namely the objective of ensuring the stability of the banking system of the euro area as a whole". According to the Court, given the imminent risk of financial losses affecting all depositors if the two Cypriot banks had failed, the measures taken did not constitute a disproportionate and intolerable interference in the depositors' right to property.[31]

Many Cypriot savers feared that their bank deposits might no longer be safe but were subject to credit risk (Orphanides, 2014). A large number of them tried to withdraw their money and move their savings abroad. This necessitated the Cypriot authorities as from mid-March 2013 to place temporary *restrictions on bank transactions and deposit withdrawals* and, following this 'bank 'holiday, to impose *controls on capital outflows*. Substantial capital flight would also have complicated the government's return to the capital market.

According to an assessment by the European Commission (in a press release of 28 March 2013), the restrictions on the free movement of capital in Cyprus were permitted under the Treaty, because they constituted a matter of overriding public interest and were time-bound, non-discriminatory, suitable and proportionate. As many observers noted, however, the Cypriot euro was as a result different from the euro circulating in other member countries and the capital controls aggravated the fragmentation in euro area financial markets. As the combined banking and fiscal crisis subsided, the banking restrictions were removed and the capital controls phased out over the period until end-April 2015. This experience together with that of Greece showed that capital controls remain part of the toolkit of national policymakers to address stability risks, while they may also serve to create a captive sovereign bond market.

4.4.2 *Imposing mandatory loans and capital levies?*

Are there any other repressive acts that (nearly) insolvent euro area countries might think of introducing in the future? Arnold (2011), Fitoussi et al. (2011), Grözinger (2011) and Richter (2012)

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[30] Article 17 of the Charter of Fundamental Rights of the European Union allows for the possessions of citizens to be confiscated if this is "in the public interest" and "subject to fair compensation". A real and immediate threat to financial stability may be regarded as establishing a public interest for bailing in private bank claims. However, Member States have a great deal of discretion in applying this EU charter.

[31] This judgement appears in line with the ruling by the European Court of Justice in 2012 that allowed the ESM to act as a fiscal backstop for euro area governments in distress in order to preserve financial stability in the euro area as a whole (see Section 3.5.2).

point to the long history of forcing taxpayers, citizens or retail investors to lend to their government, notably in times of war and crisis. They argue that the tools of mandatory lending to the government compare favourably to other ways of dealing with the sovereign debt crisis, like default. Loan enforcement implies a solemn commitment of repayment to creditors when the fiscal emergency has been resolved. Yet, this promise may not be upheld in all cases. One may recall the 'euro tax' that was imposed in Italy in 1997 in order to help the country meet the deficit criterion for euro entry. The political commitment to return the money after a few years was, however, only partially met.

Bach (2012) instead favours imposing a one-off capital levy on wealthy citizens to facilitate the repayment of high government debt. The IMF (2013) calculates that a one-time levy of 10% on households with positive net wealth could be sufficient for euro area countries to return to their pre-crisis public debt ratios. Recognising the conditions that must be met and the risk of capital flight, the Deutsche Bundesbank (2014) also puts this option forward as an orderly way out of national fiscal emergencies before asking for official assistance from partner countries. Kempkes and Stähler (2014) confirm that a credible commitment of the government not to repeat the capital levy is a key condition for its success. If this condition is met, their model calculations suggest that a one-off levy carries relatively few economic costs; if not, the wealth levy leads to lower output and higher unemployment in the long run than conventional fiscal consolidation, because in this case its effects are similar to a permanent tax increase on the return of capital.

The experience with Cyprus showed that – as might be expected – capital levies that amount to confiscation to rescue the country or the banking industry have no popular support. They triggered a 'bank run' in Cyprus and risked doing the same in other vulnerable euro area countries with a large banking sector and weak public finances. The option of imposing a one-off capital levy raises many questions, such as whether to exempt holdings of government bonds, how to include non-financial assets that cannot easily be mobilised, how to ensure the supply of bank credit when holdings of bank bonds and saving deposits are hit, and how to prevent citizens (notably the rich) from moving their capital into the shadow economy or abroad as soon as the parliamentary discussion starts (see also Eichengreen, 1990). To counter circumvention, a coordinated introduction in all euro area countries or in all high-debt OECD countries would be unavoidable. All these issues make a capital levy to solve the fiscal predicament of a country politically unattractive and economically unwise.

As alternative to a capital levy, several countries have introduced a bank levy, a very high marginal income tax rate for high-income earners, a special levy on exceptional bonuses, and/or higher wealth taxes for rich citizens (Bräuninger, 2012). Even though these policy choices may trigger tax evasion and the expected revenues may not be spectacular, such 'Robin Hood taxes' could serve the perceived need of a fairer income and wealth distribution.[32]

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[32] Some very rich citizens in Germany, were the wealth tax was abolished in 1997, appealed to their government asking to (re)introduce a wealth levy for reasons of fairness.

4.5   Assessment and conclusion

The fiscal legacy of the financial crisis that erupted in September 2008 raised serious market concerns about the longer-term creditworthiness of several euro area countries and interacted negatively with their short-term access to capital markets at affordable interest rates. The sovereign debt crisis in the eurozone has shown that member countries are particularly vulnerable to the fickleness of foreign investors. Euro area governments issue their euro-denominated debt in a currency they cannot control. Moreover, creditor protection regimes differ widely across euro area countries. Although there is an open capital market, the national authorities may still impose capital outflow controls in their public interest to prevent foreign investors from pulling their money out of the country in a crisis. For all these reasons, foreign investors in particular should be expected to keep a close eye on the sovereign credit risks of euro area countries and on the correlated credit risks of private borrowers.

This suggests that in times of fiscal stress public debt agencies have a strong incentive to induce local audiences to buy and hold the debt issued by their own government, in line with the theoretical model proposed by Chari et al. (2016). For analysing fiscal sustainability, in terms of liquidity as well as solvency, it is therefore important to distinguish between domestic and foreign holders of government debt, as in turbulent times these two investor categories face different market incentives, as well as a different exposure to financial repression with a fiscal motivation.

This chapter showed that as part of their strategies to preserve or restore fiscal sustainability euro area governments managed both the supply and demand of sovereign debt. Public debt managers tried to make issuance conditions more attractive to specific investors and better targeted at domestic audiences. The presented selective evidence also showed that several euro area countries have adopted heterodox techniques to deal with market stress. They inter alia sought to create a captive domestic investor base and reduce the cost of government funding in response to the retreat of foreign investors and rising sovereign bond yields. Sometimes, public sector interventions were aimed at enforcing a higher demand for sovereign debt, notably from resident financial institutions, while prudential measures to safeguard the banking system also played a protective fiscal role.

Several euro area countries received EU/IMF loans to bridge their borrowing needs and also benefited from debt service relief, whereas Greece also looked for debt forgiveness from its official creditors. Greece and Cyprus, whose solvency was impaired, arranged a 'voluntary' public debt restructuring at the expense of private creditors and also had to place temporary restrictions on bank transactions, deposit withdrawals and capital outflows. Following agreements with the Eurogroup, Cyprus furthermore considered imposing a stability levy on all insured bank deposits, which was rejected by its parliament, and in the end it bailed-in uninsured deposits.

These classical responses to market volatility and fiscal stress suggest that several eurozone governments have returned to financial repression of domestic savers and investors as a politically convenient complement to fiscal reforms and as a fiscal insurance against the retreat of foreign investors. This 'non-standard' public debt management was concentrated in troubled euro area

countries where vulnerable governments had lost market access or were faced with severe market pressure and contagion. They effectively turned domestic savers and investors into 'lenders of last resort' in a gamble for fiscal resurrection. Even a confiscation of private financial assets was proposed and put into practice in the context of sovereign/bank debt restructuring. Notable in this respect was a judgement of the European Court of Justice that a breach of the right to property of EU citizens can be tolerated if this was necessary to ensure the stability of the banking system in the euro area as a whole.

A (partly hidden) strategy of using financial repression as a fiscal and/or quasi-fiscal tool for keeping high public debt manageable in critical times has positive budgetary effects. These arise in particular because it lowers the cost of debt financing and may reduce the risk of severe market pressure leading to a disruptive sovereign default. However, these direct benefits must be compared with the economic costs of enforcing a 'home bias' in capital allocation and crowding out private capital formation, the higher financial stability risks from increasing the fiscal exposure of the financial industry, and the distributional implications from imposing income and wealth transfers from savers and private creditors to taxpayers and public debtors.

Focusing on the functioning of the eurozone, an enforced 'home bias' in government debt holdings would imply that countries forego the economic benefits of an efficient allocation of capital across the EMU. Moreover, channelling domestic savings with priority to the national government prolongs the fragmentation of euro area sovereign bond markets along national lines of creditworthiness observed during the crisis, which extends to private credit markets and distorts an even monetary transmission across the eurozone (ECB, 2012a,b). Even though sovereign bond yield differentials have converged again as the crisis pressure subsided, a permanently higher share of resident holders of government bonds who may be less able to freely substitute them for debt securities issued by other eurozone countries would entrench financial fragmentation.

Another legacy of the sovereign debt crisis is that the financial industry has purchased more domestic government bonds, especially in vulnerable countries. Although undercapitalised banks could use these 'safe' assets as eligible collateral to get cheap central bank credit for funding their lending business, these acquisitions may crowd out private credit. The reason is that in a balance sheet recession leveraged financial intermediaries are focused on raising capital and liquidity buffers and may lack the resources for supplying credit to those households and firms that are still able and willing to borrow (Broner et al., 2014; van der Kwaak and van Wijnbergen, 2017).[33] A higher sovereign exposure also makes them vulnerable to credit downgrades and valuation losses on their government bonds, which further undermines bank lending activity and increases financial stability risks (ESRB, 2015). As witnessed from 2008-2013, the growing exposure of credit institutions to vulnerable countries amplified the transmission of sovereign stress to already fragile bank balance sheets, leading to higher bank lending rates and lower bank credit (Altavilla et al., 2017).

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[33] This crowding out assumes that that there is a demand for credit during a (balance sheet) recession and banks are able and willing to supply new credit at a time when they are likely faced with many non-performing loans on their balance sheet.

As privileged funding eases the government's liquidity constraints, it may also create incentives for policymakers to postpone fiscal consolidation and budgetary reforms. The consequent higher level of public debt in turn undermines the government's solvency (Asonuma et al., 2015). A larger captive domestic investor base then also implies greater economic damages from a potential sovereign default in the future. Furthermore, imposing below-market (real) returns on sovereign bonds to ensure cheap government funding or confiscating private wealth to remove a public debt overhang has considerable redistributive implications, reduces incentives to save and will trigger evasive action. Domestic creditors will carry extra risks and may demand a price in return for accepting a below-market interest rate or a large debt absorption volume, for example in the form of special tax privileges.

Concluding, several euro area governments were able to secure sometimes considerable short-term benefits from the various forms of financial repression, as a complement to other, more orthodox debt stabilisation policies. Calling in this fiscal insurance was obviously vital for them in turbulent bond markets and during funding stress, even more so when they had lost market access. The non-standard public debt management operations to create a captive domestic investor base also entrenched the fragmentation of euro area government bond markets along national lines and tightened the financial nexus between banks and their sovereign. The growing share of resident holders of government debt may therefore have eased fiscal stress at the expense of constraining bank credit supply to the private sector. As will be become clear in Chapter 6, this financial fragmentation in turn has impaired an even monetary transmission across the eurozone, obliging the ECB to step up its non-standard monetary policy interventions, exposing the euro area economy to a number of adverse side-effects.

Looking ahead, most euro area sovereigns still face a post-crisis debt overhang and since their creditworthiness is under permanent market scrutiny they have to prioritise public debt reduction so as to preserve or reclaim the status of their bonds as a relatively safe asset. Applying the tools of financial repression may have served national governments well by helping them to stabilise volatile sovereign debt markets in times of fiscal stress. But the more sustainable way to address the fiscal legacy of the crisis is to advance public debt deleveraging and to cut back contingent fiscal liabilities with the aim to increase the resilience of fiscal positions to adverse shocks. Cautious public debt management strategies should complement this objective, as with integrated financial markets a government with a vulnerable debt profile in terms of maturity structure, currency composition and/or investor base may get into liquidity stress more easily and thereby create contagion risks for other countries.

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5.   The privileged treatment of public debt in European finance [34]

[T]he current prudential treatment of sovereign exposures is no longer tenable ... prudential regulation is a useful complement to sound public finances, but not a substitute for them.

BIS (2016, pp.92-93)

5.1   Introduction

Many advanced economies are looking for ways to reduce their public debt from the very high levels reached in the aftermath of the global financial crisis of 2008 (see van Riet (ed.), 2010; Abbas et al., 2011; Reinhart and Rogoff, 2011). The experience of past crises and post-war episodes, when advanced economies were also confronted with a public debt overhang, might provide an answer to the question of how they might go about. Reinhart and Sbrancia (2015, p.324) point in this respect to the response to the Great Depression of the 1930s when "the pendulum had begun to swing away from laissez-faire financial markets toward heavier-handed regulation". World War II provided further arguments for pervasive financial restrictions, which, after the war, continued to protect governments from market stress and help them reduce their massive public debts. Reinhart and Rogoff (2011) therefore expect that the fiscal legacy of the crisis will probably lead advanced economies back towards a regulated financial system more akin to the one that existed prior to the market-oriented reforms of the 1980s.

As international financial markets in general and the banking industry in particular were blamed for the crisis, which put an unfair burden on taxpayers, the leaders of the Group of Twenty major economies (G20), including the European Union (EU), committed to restoring the health and stability of the global financial system (see G20, 2008). Following the G20 initiatives, the competent authorities in the EU set out to correct financial market failures, tighten financial regulation, enhance financial supervision and improve the resilience of financial institutions in Europe. The European Commission implemented a comprehensive financial reform programme with the overall objective to create a more resilient and growth-supportive EU financial system and to secure financial stability. In addition, EU authorities took a range of emergency and structural measures that seek to reduce the fragility of Economic and Monetary Union (EMU) and increase the ability to deal with a major eurozone crisis.

These supranational interventions may be viewed as a public policy response to legitimate growth, stability and distributional concerns associated with the apparent market, institutional and regulatory failures. However, the reform of European finance went further than just removing financial market distortions, correcting deficient regulations and strengthening supervisory institutions: it also significantly widened the scope of the existing preferential treatment of sovereign debt in financial

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[34]   An abridged version of this chapter (covering parts of Sections 5.1, 5.2, 5.3.1 and 5.3.2) is forthcoming in E. Avgouleas and D.W. Donald (eds.), *The Political Economy of Financial Regulation*, Cambridge University Press, New York, 2018.

legislation and led to a broad array of additional regulatory advantages, as well as new official support facilities at the European level that made it easier for euro area governments to obtain market funding at favourable interest rates and to manage and reduce the crisis legacy of high public debt.

As discussed in Section 3.5, the legal framework of the EU appeared to offer little scope for a revival of market access support for governments, given that the prevailing 'fiscal rules of the game' force them to finance public debt in an open capital market and, hence, subject to market discipline. However, the euro area crisis offered arguments for introducing new ways to ring-fence governments against market pressure, notably under the guise of prudential legislation (Reinhart and Rogoff, 2011) and public policy concerns motivated by the quest for a resilient financial system and a stable EMU (van Riet, 2013).

This chapter reviews the main crisis-driven financial reforms and market interventions in Europe with the objective to identify where new government funding privileges have appeared in supranational regulations, directives and agreements, as policymakers set out to preserve financial and monetary stability and address a sovereign debt crisis that undermined the cohesion of the eurozone.[35] As it turns out, the overhaul of European financial governance to improve crisis prevention, management and resolution benefits public debt management and resolution in many ways. These fiscal benefits occur (or could occur), in particular, through the captive sovereign credit markets created by EU prudential legislation for commercial banks, collective investment funds, institutional investors and other financial firms which disregards the risks from high sovereign exposures; the reduced market pressure associated with new restrictions placed on short-selling of government bonds, buying sovereign default protection and issuing sovereign credit ratings; the revenues from the proposed common financial transactions tax from which, moreover, trading in government bonds might be exempted; the availability of official rescue funds and market support facilities that might be exploited to excessively suppress sovereign bond yields in times of fiscal stress; the exceptional possibility for euro area countries to initiate a 'voluntary' debt restructuring while subordinating private creditors; and the apparent ease with which even insured savers might be expropriated when resolving a troubled systemic bank while introducing capital outflow controls.

This chapter also proposes a new composite index of the preferential treatment of sovereign debt found in 10 cases of EU prudential legislation introduced over the period 2008 to 2017. The two variants of the index – one comprising the de jure application of these special provisions and the other also their de facto market influence upon announcement of these laws – show a growing privileged treatment of public sector funding relative to the private sector over time, with the total of these financial favours so far reaching a peak in 2019-2020 as new sovereign privileges are offset by slightly less generous special provisions elsewhere.

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[35] The review of EU prudential legislation focuses on regulatory privileges for euro area sovereigns (central governments) while it acknowledges that in many cases similar advantages apply to the national central bank, regional and local governments, public sector entities, multilateral institutions and third country governments. Moreover, many EU financial laws are of relevance for the whole European Economic Area.

Enabling governments to protect themselves from market pressure and in exceptional cases to expropriate private assets may be understandable given the heavy fiscal legacy of the crisis, the systemic role of government bonds as safe and liquid assets and the view that market participants should be the first in line to carry the costs of bank failures and a sovereign default. This may offer national governments some compensation for the fact that their ability to exercise political dominance over the domestic financial industry and capital markets in general is being further constrained by two developments: first, the recent centralisation of banking supervision and resolution under the European Banking Union, and second, the planned harmonisation of capital market law as part of the Capital Markets Union (see Section 3.5.1 and Véron, 2012, 2014).

However, extensive government privileges in public debt financing also create moral hazard on the part of sovereigns and undermine incentives for fiscal adjustment and economic reforms. They put a heavy burden on the successful implementation of the reinforced EU economic governance framework and the conditionality attached to using the new official backstop mechanisms of the euro area that seek to ensure sound macroeconomic and fiscal policies. Moreover, a regulatory bias towards large sovereign exposures in financial institutions may become an economic and prudential concern, given the possible crowding out of private sector funding and the risks for financial stability in times of fiscal stress (see also ESRB, 2015). At the international and European level discussions are ongoing on whether, how and in what pace to phase out these provisions in prudential banking legislation (BCBS, 2017). The evidence in this chapter shows that an encompassing approach covering the whole financial system is warranted, taking account of the risk of regulatory arbitrage.

This chapter is structured as follows. Section 5.2 describes the changing governance of finance in Europe in the wake of the global financial crisis and offers three (complementary) explanations, including the occurrence of financial repression. Section 5.3 documents where key government funding privileges are showing up in the crisis-driven overhaul of financial regulation over the period 2008 to 2017. While the result is a fairly extensive overview, it concurs with Reinhart and Sbrancia (2015, p.322) that "[t]he list is barely the tip of the iceberg, as volumes would be required to fully capture all that has been turned into law – let alone what has been and continues to be discussed".[36] Section 5.4 makes transparent the rising trend since 2008 in the preferential regulatory treatment of sovereigns based on two variants of a newly constructed index of government funding privileges related to in 10 EU prudential financial laws in force or proposed. Section 5.5 concludes that the financial reforms and capital market interventions at the supranational level should make European finance more resilient and less prone to adverse shocks, but that the concurrent, growing quasi-fiscal regulatory advantages may fuel moral hazard on the part of sovereigns.

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[36] For example, EU directives also make it possible to grant European sovereign debtors specific privileges with regard to the initial public offering of their securities, disclosure requirements for listed securities and the preservation of market integrity. These EU provisions allow Member States in particular to exempt sovereigns from the obligation to publish a prospectus and from regular financial reporting requirements, and to exempt public debt management transactions from the rules against insider dealing and market manipulation. These sovereign privileges are discussed by Kersting (2012) and not covered in this study.

5.2   Financial reform turning into financial repression?

Over the course of the 1970s-1990s, financial markets in advanced economies were widely liberalised. This evolving trend had at least two consequences for governments: first, they had to introduce prudential regulation and supervision of the financial sector to protect savers and investors and preserve systemic stability (Masciandaro and Quintyn, 2013); second, they had to pursue credible stability-oriented economic policies in order to convince market participants that they were creditworthy, which would allow them to attract savings at affordable, market-determined (real) interest rates in open capital markets.

Gelpern and Gerding (2016) observe in this light that the law plays an important role in making investors believe that specific assets are 'safe' and they will always get their money back. Beyond the core powers of a nation state to access the country's resources, national policymakers use their powers of legislation, regulation and contract design to coordinate market participants towards selecting the sovereign benchmark asset promoted by law and to act as if it was safe, even if reality is different. Governments greatly facilitated meeting their new challenge of financing public debt in open capital markets by making sure that the prudential requirements for financial intermediaries, notably banks and institutional investors, would largely exempt holdings of domestic government debt. Accordingly, they labelled government bonds as 'safe' for regulatory purposes.

Also supported by favourable credit ratings and the absence of defaults, the sovereign bonds of advanced economies were generally perceived as safe assets and therefore functioned as a stable cornerstone for the development of the financial system (IMF, 2012a; Castro and Mencía, 2014; van Riet, 2017). As a 'risk free' financial instrument they served inter alia as a high-quality liquid asset on bank balance sheets for meeting prudential standards, a stable store of value for institutional investors, a reliable form of collateral in repurchase and derivatives markets as well as for central bank refinancing operations and payment and settlement systems, and as a benchmark for pricing private sector securities. The growth of government bond markets in fact underpinned the rapid global expansion of financial markets and institutions in recent decades, with international regulatory coordination and supervisory cooperation struggling to keep pace.

As pointed out by Goodhart (2010, p.5), this "triumph of the markets" was criticised in the aftermath of the global financial crisis that erupted in September 2008. As stated by the European Commission (2014b, p.3) "[p]olicymakers, regulators and supervisors around the world failed to identify and adequately address the risks building up in the financial system". A combination of market, regulatory and supervisory failures enabled the private sector in many countries to accumulate an unsustainable mountain of debt. Moreover, 'too-big-to-fail' systemic banks had taken too many risks in their global hunt for higher yields and still many of them succeeded in passing their rescue bill on to taxpayers.

This negative experience motivated a newly empowered G20 to strengthen financial markets and remedy the shortcomings of regulatory regimes so as to avoid future crises. At the Washington Summit of 15 November 2008, the leaders of the G20 established common principles for the reform of

financial markets and an action plan (G20, 2008). Following the G20 initiatives, the competent authorities in the EU set out to correct financial market failures, tighten financial regulation, enhance financial supervision and improve the resilience of credit institutions in Europe. The European Commission (2010a, 2012a, 2014b) embarked on a comprehensive financial reform programme with the aim to make the financial sector "more stable, more responsible, less speculative and less short-termist, and more oriented towards long-term growth" (European Commission, 2012a, p.23).

Within the eurozone, the global financial crisis also revealed the large macroeconomic, fiscal and financial imbalances in several countries. This made apparent that the original institutional architecture and governance framework of EMU was too weak to prevent and correct the build-up of such imbalances (Mongelli and van Riet, 2013). Moreover, national governments were often unwilling to observe the common rules for sound policies and/or to exercise effective peer pressure on partner countries to abide by the agreements. Against this background, the pre-crisis convergence of long-term sovereign bond yields to the low levels of the most stable eurozone countries was out of line with national fundamentals. As the sovereign debt crisis broke out in late 2009, market pressure returned with a vengeance for the most vulnerable countries and risk premia in sovereign bond yields ratcheted up. This reflected a flight to quality, rising default expectations, a vicious feedback loop between weak governments and fragile domestic banks, cross-country contagion effects and the appearance of currency conversion risk premia. By contrast, the most creditworthy euro area members acted as a 'safe haven' for investors and enjoyed exceptionally low interest rates (see Section 4.2.2).

EU authorities took a range of legislative measures that aimed to reduce the fragility of EMU and increase the ability to deal with a major eurozone crisis. To address macroeconomic and fiscal imbalances they put in place a reinforced EU economic governance framework, complemented by stronger national budgetary frameworks (Koester et al., 2012; Kamps et al., 2014). In addition, they constructed the main pillars of a European Banking Union with the aim to break the pernicious stress dependence between weak sovereigns and fragile banks in their jurisdiction (European Commission, 2012b). Moreover, they created new euro area rescue facilities to give distressed countries the opportunity to request temporary loans and market access support under strict policy conditions. Subject to strong and effective adjustment programs, this in turn would enable the ECB to purchase their sovereign bonds in secondary markets, if this was required for monetary policy purposes (ECB, 2012a). These fiscal and monetary backstops at the euro area level seek to prevent an uncontrollable 'debt run' in vulnerable eurozone countries that could lead to a disintegration of EMU.

The overall objective of this overhaul of the supranational governance of finance in Europe is to create a more resilient and growth-supportive EU financial system and to secure financial and monetary stability in the euro area. However, this comprehensive policy response also significantly widened the scope of the existing preferential regulatory treatment of sovereign bonds and introduced new official support facilities that taken together constrain market-based fiscal discipline. This comprehensive policy response may reflect at least three (complementary) political economy considerations.

First, for reasons of tax fairness, the financial sector should be expected to make a larger contribution to public revenues. As pointed out by Huizinga (2004), EU countries in the past have tended to subsidise domestic banks using tax, regulatory and supervisory instruments to offer them a relief from the high explicit and implicit levels of taxation in economies with a repressed financial system. The liberalisation of the European banking sector and the introduction of the euro forced governments to reduce the net fiscal and quasi-fiscal burden on domestic banks that now faced heightened international competition to an unduly low level. The strong policy competition among Member States resulted in extensive tax and cost benefits, light-touch regulation and lax supervision (ESRB, 2012). Governments were also under the influence of regulatory capture and political pressure from banking sector lobbies seeking to reduce their fiscal and quasi-fiscal burden (ESRB, 2014). To counter this moral hazard and recoup foregone tax revenues, the financial sector should in this view make a larger contribution to public revenues (IMF, 2010; Chaudry et al., 2015; Devereux et al., 2015). Moreover, financial markets and services could serve as a vehicle for increased implicit taxation of the private non-financial sector. To ensure the effectiveness of the related financial sector taxes and to prevent tax arbitrage in a setting with open capital markets, they should be introduced at the European level.

Second, benevolent governments may be seeking to restore a mutually beneficial relationship between the public sector and the financial sector. Monnet et al. (2014) interpret the changing financial landscape as a reactivation of the multi-faceted interactions between governments and their financial systems that were predominant until the 1980s; these served, inter alia, to facilitate economic adjustment and maintain financial stability. The stronger role of the state in finance is necessary in order to stabilise public finances in a more volatile financial market environment, in the interest of all players in this political game. Taking this view, a preferential treatment of public sector versus private sector debt securities reflects the importance of preserving the role of government bonds as safe and liquid assets as a precondition for maintaining a stable financial system and giving governments fiscal space for fine-tuning the business cycle.

Third, the more critical position taken in this study is that the wider reach of government funding privileges can be interpreted as a financial repression strategy to sustain public debt sustainability (Reinhart, 2012; van Riet, 2013). European policymakers may have felt compelled in this respect to maintain a 'level playing field' for euro area governments in attracting international investors to their semi-safe debt. A common feature of financially repressed systems is that government bond prices are distorted by non-market players and regulation. The consequent suppression of market discipline may find political acceptance under the guise of EU prudential legislation (Reinhart and Rogoff, 2011) and the need to remove excessive risk premia that individual members of EMU are unable to control in full (Kopf, 2011). In addition, making sovereign debt restructuring easier could come to be seen as unavoidable to address the crisis legacy of high public debt (Reinhart and Rogoff, 2013). Taken together, in conjunction with the crisis response a modern supranational form of financial repression has arisen in Europe with the objective to ease fiscal stress and the burden of high public debt.

5.3   Government funding privileges in European finance

As a result of the crisis-driven overhaul of the governance of finance in Europe the freedom of financial markets and institutions will in any case be more constrained in the future than before the crisis. As documented in detail below, a significant number of the reforms and market interventions at the supranational level show a tendency towards facilitating market access for the public sector, establishing 'safety valves' in times of fiscal stress and calling on the private sector to share the burden of public debt resolution and bank recovery. The wide array of changes in the governance of European finance over the period 2008 to 2017 – some of which are only relevant for euro area countries – may be subdivided in three groups, indicating their scope and focus:

1. crisis prevention, helping all governments with debt financing;
2. crisis management, supporting countries facing funding stress; and
3. crisis resolution, benefiting countries at risk of or in default.

The following sub-sections offer a detailed discussion of the history, motivation, implementation and potential impact on euro area governments, the financial sector and capital markets.

5.3.1   Crisis prevention measures

To prevent a repetition of the financial crisis, European authorities decided to tighten EU prudential legislation. As set out below, the existing preferential regulatory treatment of government bond holdings found in EU prudential legislation for banks and insurers has gained in weight and part of it has been extended to other financial institutions and markets. In addition, a group of euro area countries is considering how to impose a harmonised financial transactions tax.

1.   EU prudential banking legislation

A privileged market access for governments based on prudential considerations can be found already in the Basel Accord of 1988. This agreement among the Group of Ten (G10) major economies determined the supervisory regulations governing the capital adequacy of international banks based on the weighted relative riskiness of broad categories of assets, focusing on credit risk. One of the contentious issues was how to treat bank claims on foreign governments relative to those on the domestic government which were deemed to be 'safe'.[37] As documented by Goodhart (2011, p.154; 2013, p.243), Europe insisted to apply the basic principle of the EU Treaty that all Member States should be treated equally and enjoy the same high credit standing, which should translate in a zero credit risk for bank claims on all EU sovereigns. To allow for an equal assessment of sovereign instruments among the 'club' of G10 members and other advanced economies, the Basel Committee on Banking Supervision (BCBS) then decided to extend the preferential treatment of sovereign

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[37]   The idea was that a sovereign can always meet its nominal payment obligations by issuing more of its own currency. This argument raised questions for those countries where the central bank was independent and later for the member governments of the euro area where debt monetisation by the ECB was excluded by law. See also BIS (2016, p.90).

exposures by default to those vis-à-vis all OECD countries.[38] As observed by Goodhart (2011, p.159) true economic risk played no role in this decision, but it was the only way to reach a political agreement on the subject.

When assessing banks' capital adequacy, the national supervisory authorities could hence give all claims on central governments (and central banks) within this country grouping as well as those guaranteed by them a zero weight (or a low weight in case interest-rate risk was also incorporated, with the discretion to build in further types of risk). By contrast, bank exposures to a central government (or central bank) outside the OECD would only get a zero-risk weight when they were denominated in the national currency of the borrowing sovereign and funded by bank liabilities in the same currency. For claims on domestic non-central government public sector entities, which had a varying creditworthiness, the BCBS allowed discretion to national supervisors to determine the appropriate risk weights (at 0%, 10%, 20% or 50%), while setting it at a uniform 20% for those claims originating from other OECD countries (see BCBS, 1998).

The revised Basel Accord (known as Basel II) of 2004 introduced a significantly more risk-sensitive capital assessment based on two credit rating approaches: a standardised one and another based on banks' internal risk models (see BCBS, 2006). Given the new focus on credit ratings, membership of the OECD was no longer sufficient for sovereign exposures to attract a zero-risk weight. However, national authorities were given the choice to give bank claims on the sovereign a preferential treatment if certain conditions were met.

At the European level, the Basel Accords I and II found their way in successive versions of the Capital Requirements Directive (CRD), which were transposed into national law of the Member States for supervisory application to credit institutions and investment firms. These EU directives essentially considered government securities as 'safe' assets by definition, irrespective of credit, market and concentration risks (Kopf, 2011). For banks located in a euro area country the changeover to the euro in 1999 implied a substantial increase in the effective scope of the preferential regulatory treatment of sovereign exposures. Before 1999, their focus was on holding own government bonds because exchange rate risk still acted as a barrier to their cross-border investments in debt securities issued by other prospective euro area central governments – even though central government debt from all OECD members attracted a zero-risk weight. After the inception of the euro, these banks could buy the central government bonds of other countries in the eurozone not only without having to worry about extra capital charges for lower-rated sovereigns but also without having to accept exchange rate risk. As their claims on individual governments were furthermore exempted from the large exposure limit that applied to private assets, they enjoyed a regulatory incentive to diversify their country risk and 'hunt for yield' across the whole eurozone (see also McCauley and White, 1997).

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[38] More precisely: all full OECD members or countries which had concluded special lending arrangements with the IMF associated with the Funds' General Arrangements to Borrow (the club was subsequently extended to include those countries having signed the New Arrangements to Borrow). Later it was added that any country which reschedules its official external debt is precluded from this group for a period of five years. For details see Goodhart (2011, Chapter 6).

Following the global financial crisis, tighter Basel III standards were approved by the G20 in November 2010 and published one month later (BCBS, 2011). The EU Capital Requirements Regulation (CRR) and update IV of the Capital Requirements Directive (CRD IV) transposed these international standards into EU law; they entered into force in July 2013 and take gradual effect from January 2014 onwards with full implementation to be achieved within five years (see European Union, 2013d and e, respectively). As a regulation, the CRR applies directly to credit institutions, investment firms and supervisors in the EU. By contrast, the CRD IV requires Member States to enact national legislation that is in conformity with this directive; failure to do so would trigger an infringement procedure. Their overall aim is to strengthen the quantity and quality of bank capital, limit large capital exposures, ensure liquidity, promote stable funding and constrain leverage. This revamped EU prudential banking legislation contains several important cases of a preferential treatment of bank claims on the government, some of which will be restricted over time, while others are additional compared to those in the earlier CRDs.

a. Capital adequacy

According to the Basel II and III agreements, banks must hold a minimum amount of capital against the credit risk of all their exposures in the banking book, including their sovereign exposures. Two methodologies for calculating the credit risk weights may be adopted: the standardised approach, which relies on external credit ratings; and the internal ratings-based approach, which relies on (large) banks' own risk assessment models. Under the standardised approach of the Basel II/III framework national authorities have the option to give a preferential treatment to sovereign exposures in the banking book as compared to exposures to non-financial private corporations with similar risk characteristics. National authorities can use this discretion to allow banks to apply reduced credit risk weights to their sovereign exposures, if these assets are denominated in the domestic currency of the sovereign as well as funded in the same currency. Moreover, sovereign claims held in the trading book also receive a reduced standardised risk weight for specific market risks, notably for credit spread risk (see BIS, 2013, 2015).[39]

Under the standardised approach, as was the case before in the relevant EU directives (CRD I-III), the new EU regulation (CRR; European Union, 2013d) grants a zero-risk weight to exposures vis-à-vis the central government of any Member State (irrespective of the issuer's credit rating) if these are

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[39] The Basel Committee on Banking Supervision has undertaken a fundamental review of the capital requirements for securities held in the trading book, since these positions are subject to the risk of losses arising from movements in market prices (BCBS, 2016). The new standards on the treatment of market risk in the trading book, taking effect from January 2019, continue to allow banks to give a preferential treatment to sovereign exposures. For example, in their internal models they may assess the credit spread risks for sovereign bonds over a much shorter horizon than for equally rated corporate securities, based on the historical experience that the former are more liquid and easier to sell at times of market stress than the latter (see also BIS, 2015). The European Commission (2016) has put forward similar trading book rules for EU credit institutions, assigning exposures to all EU sovereigns always the lowest risk weights in credit spread risk calculations under the standardised approach. Likewise, a beneficial treatment is introduced under the internal models approach via shorter liquidity horizons for the expected liquidity-adjusted shortfall on exposures to EU sovereigns than for claims on EU corporations (except for covered bonds).

denominated and funded in the domestic currency (this preferential treatment also extends to the national central bank, ECB, EU, international organisations and multilateral development banks). For banks in the eurozone, this preferential treatment covers by default their claims on all EMU countries if these are denominated and funded in the euro, since this is their relevant domestic currency. The risk-free assumption may also be applied to financial instruments issued by regional governments and local authorities and in exceptional circumstances to those from public sector entities.[40]

Until 2017, the standardised approach, as applied in the EU, also continued to extend the zero-risk weight to all EU sovereign exposures denominated and funded in any other EU currency than that of the issuing Member State; in subsequent years, this transitional provision is phased out (starting two years later than envisaged earlier). From 2020 onwards in these cases the assessment of external credit rating agencies will have to be followed (see Tables 5.1 and 5.2). For euro area banks this forthcoming more realistic risk weighting of sovereign claims in non-domestic EU currencies is only of modest relevance; as mentioned above, banks based in the eurozone can automatically value all their euro denominated and funded exposures vis-à-vis EMU governments as zero-risk claims (see also Angelini et al., 2014). This implies that, for example, the government bonds issued by eurozone countries hit by the sovereign debt crisis will continue to be treated as risk-free for all euro area banks. Goodhart (2013, p.244) critically describes this outcome as "patently ludicrous" (see also the critical views of Pomerleano, 2010; Kassow, 2010; Kopf, 2011; Ayadi et al., 2012; Nouy, 2012; Gros, 2013; Weidmann, 2013).

Table 5.1 – Credit risk weights for exposures to central governments

(standardised approach; ratings from nominated external credit assessment institutions)

Credit quality step	1	2	3	4	5	6	unrated
External credit rating (example S&P)	AAA, AA	A	BBB	BB	B	CCC and below	unrated
Credit risk weight	0%	20%	50%	100%	100%	150%	100%

Source: Final draft implementation technical standard jointly prepared by EBA, EIOPA and ESMA (November 2015); mapping between the long-term issuer credit assessments of Standard & Poor's, the credit quality steps and the credit risk weights under the standardised approach of the EU Capital Requirements Regulation, in accordance with Articles 114, 136(1) and 136(3) of Regulation (EU) No 575/2013 (European Union, 2013d).

The Basel II/III framework allows banks using internal risk models to permanently adopt the standardised approach for assessing credit risk for non-significant business units and asset classes that are immaterial in terms of size and perceived risk profile. Going beyond this Basel II/III 'carve out', the EU regulation (CRR) permits banks normally using internal credit ratings to apply the standardised approach to a wide range of sovereign exposures (covering the whole public sector of the Member

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[40] Furthermore, sovereign exposures with respect to non-EU countries also receive a zero-risk weight if the regulatory authorities there have at least equivalent prudential legislation in place and give claims on their sovereign issued and funded in the domestic currency a risk weight of zero.

States) – even those of material size and perceived risk – as long as they would be assigned a standardised zero-risk weight (see Nouy, 2012; BIS, 2013; Castro and Mencía, 2014; ESRB, 2015 on this so-called 'permanent partial use of internal credit ratings). The EBA is required to issue guidelines at the latest in 2018 that limit over time the use of the standardised approach by banks that normally use internal ratings. This would narrow the broad scope of this sovereign privilege and bring it more in line with the original intention of Basel II/III, i.e. to reduce the burden for banks of calculating internal ratings but only for small exposures.

The internal ratings-based approach implies that (large) banks must make an assessment of the probability of default for the issuers of their claims and in more advanced cases also of the loss given a default. For exposures to other banks and the corporate sector the CRR sets a minimum floor of 3% for the probability of default; for sovereign exposures, however, the Basel II/III framework and the EU regulation give no such floor. As banks typically base their calculations on historical experience and sovereign defaults in advanced economies have been a rare event, they tend to attach the lowest possible probability of default to government bonds. Also taking into account the estimated loss given a default, this special treatment leads to a (very) low internal risk weight for sovereign exposures.

Table 5.2 – Regulatory capital treatment of bank claims on the government [1]

(EU prudential banking legislation - CRR/CRD IV; in percent of standard credit rating)

Claims issued and funded in:	Domestic currency	Other EU currency			
Year of application:	*permanent*	*2014-17*	*2018*	*2019*	*2020*
Claims issued by:					
Domestic government of a euro area country	0%	0%	20%	50%	100%
Government of any other euro area country	0%	0%	20%	50%	100%
Government of any other non-euro area EU country	0%	0%	20%	50%	100%
Government of any non-EU country [2]	0%				

Note 1): claims on EU governments include claims on central government and the central bank and may include claims on regional and local governments and in exceptional circumstances those on public sector entities.

Note 2): 0% on condition that the regulatory authorities have at least equivalent prudential legislation in place and give claims on their sovereign issued and funded in domestic currency a risk weight of zero; otherwise the standard credit rating applies.

Overall, the zero-risk assessment applicable to all sovereign exposures in EU prudential banking regulation continues to be misaligned with the more differentiated views of markets and credit rating agencies regarding Member States' fiscal fundamentals and their probability of default. This amounts to a preferential regulatory treatment of bank claims on the public sector relative to exposures vis-à-vis the private sector, which benefits in particular euro area governments. Since the EU bank capital requirements have been tightened with the implementation of Basel III, in terms of the capital

definition, the capital criteria and five extra capital buffers for specific situations, the weight of this preferential treatment has increased even further. All else equal, this should be expected to further raise banks' structural demand for these 'safe' sovereign assets.

According to the IMF (2012a), the zero-risk weighting of domestic sovereign exposures contributed to an upward bias in the end-2007 capital adequacy ratios of banks (in terms of regulatory capital to risk-weighted assets) of 0.5 to 2.0 percentage points across European countries. This regulatory capital bias has grown since the financial crisis, because fiscal fundamentals have deteriorated and many banks have increased their sovereign exposures. Bonner (2016) shows the presence of this regulatory effect in a study of the Dutch banking sector over the period June 2009 to December 2012. Banks with a lower regulatory capital position significantly increased their demand for zero risk-weighted sovereign bonds shortly before the reporting date over and above their internal risk management targets while selling other, positive risk-weighted bonds. Korte and Steffen (2014; 2015) conclude that banks face a large contingent capital shortage due to the zero-risk treatment of their sovereign exposure, which increases potential bailout costs for taxpayers, amplifies the negative sovereign-bank feedback loop and – through their holdings of non-domestic government bonds – fuels contagion across Europe. They estimate the size of this sovereign subsidy for 54 large European banks at EUR 750 bn. or almost 100% of their core (tier 1) capital as of June 2013, a figure which was almost twice as high as that of end-2009 because actual credit risks on holdings of government debt had increased substantially.

Hannoun (2011) suggests that the regulatory authorities should move towards a more realistic assessment of sovereign risk and stricter capital requirements where necessary. The capital exercise of the European Banking Authority (EBA), announced in October 2011, was consistent with this advice. To restore confidence in the EU banking sector, the EBA issued in December 2011 a recommendation to the national competent authorities which sought to increase the transparency about unrealised losses hidden in the government bond portfolios of systemic banks. Large European banks had moved a considerable amount of government bonds from their trading book to the banking book before the earlier 2011 stress test organised by the EBA (see also Lenarčič et al., 2016, p.12). The banking book accounting rules implied a valuation at the amortised cost price which protected these government exposures from being affected by the adverse stress test scenario of a substantial decline in the market price of bonds issued by vulnerable euro area countries. The EBA therefore recommended that the participating large banks use fair values (marked-to-market prices) for all their on- and off-balance sheet sovereign exposures towards the central, regional and local governments of the countries of the European Economic Area (EEA), both in their banking books and in their trading books. In addition, the large banks were asked to create by mid-2012 an exceptional and temporary capital buffer against their re-valued sovereign exposures and to raise in this connection their core tier 1 capital ratio to 9%. The EBA's capital exercise may be interpreted as de facto introducing realistic risk weights on the sovereign exposures of the participating large banks (Korte and Steffen, 2014; 2015). This prudential intervention sought to reassure markets about the banking sector's ability to absorb unexpected losses and remain solvent. National supervisors were in this connection asked to ensure that the necessary

strengthening of banks' capital positions would not lead to an excessive pace of deleveraging, as this could aggravate the recession in affected countries. The fear was that banks in response to the EBA's capital exercise would sell a lot of their government bonds and/or significantly reduce the supply of credit to the economy.

Most large banks were able to fulfil the EBA's temporary capital requirements by mid-2012 (EBA, 2012). Mésonnier and Monks (2015) find that the large banks with a capital shortfall that were forced to raise their capital ratio generated less loan growth during the nine months of the EBA's capital exercise than those with sufficient capital (whereby a required capital ratio increase of 1 percentage point was associated with a decline in annualised bank lending growth of 1.2%). They offer two explanations for the rather small negative impact of higher capital requirements on bank lending. First, the ECB offered in its two longer-term refinancing operations (LTROs) executed in December 2011 and February 2012 a very substantial amount of cheap liquidity at an exceptional three-year maturity, which eased funding conditions for all euro area banks. The take-up of this liquidity was relatively large in countries where banks had large capital shortfalls. Second, based on conversations with national regulators, in particular in stressed countries, they conclude that in implementing the EBA recommendation, supervisors exerted moral suasion on bank managers to maintain the flow of domestic credit as much as possible. Some banks were also subject to moral suasion from national politicians to maintain lending at this point in time. These two explanations suggest that banks were under considerable pressure to continue funding their own sovereign and/or to avoid a credit crunch in the private sector that could harm their sovereign's ability to grow out of its high debt (Section 4.4.1).

As a transition to the full implementation of the Basel III capital standards in EU law (CRR/CRD IV), the EBA adopted in July 2013 a new recommendation to preserve the enhanced level of bank capital. Also taking account of the market environment, the required capital buffer against sovereign risk thus remained in force, until the EBA recommendation was repealed in December 2014.

b. *Liquidity coverage ratio*

The misalignment between regulatory and market-based sovereign credit risk in the EU's capital adequacy rules has been extended to the new EU liquidity and funding standards that follow the Basel III framework as published in December 2010 (see Nouy, 2012; Castro and Mencía, 2014; ESRB, 2015). Starting with liquidity, the CRR requires credit institutions and investment firms to hold enough unencumbered high-quality liquid transferable assets to cover their net cash outflows over a 30-day period of liquidity stress. Observance of this liquidity coverage ratio should increase the short-term resilience of banks against shocks that drain their liquidity.

A liquid asset is defined as "a freely transferable asset that can be converted quickly into cash in private markets within a short timeframe and without significant loss in value" (see European Union, 2015a, p.2). For certain types of liquid assets the market value used in the calculation of the liquidity coverage ratio is to be reduced by a specific haircut. A further differentiation is made between assets of extremely high liquidity and credit quality (so-called level 1 assets) and assets of high liquidity and

credit quality (level 2 assets, which are subdivided in level 2A and 2B). Pending specification of a uniform definition, the CRR stated that "at least government bonds … would be expected to be considered assets of extremely high liquidity and credit quality" (European Union, 2013c, p.13).

The EBA (2013) conducted an empirical analysis to compile a ranking of different asset classes according to their liquidity. EEA sovereign bonds issued in the domestic currency and with the highest credit quality (step 1 in Table 5.1 above) were indeed found to meet the criteria of assets of extremely high liquidity and credit quality. But sovereign bonds of a lower credit quality (step 2 in Table 5.1) only fulfilled the criteria of assets of high liquidity and credit quality. Adding its qualitative expert judgement, the EBA nevertheless recommended an equal treatment of all bonds issued or guaranteed by EEA sovereigns and issued in the domestic currency as transferable assets of extremely high liquidity and credit quality. Their advice was motivated by the fear that a differentiation between European sovereigns could contribute to a fragmentation of the single capital market. Moreover, in a crisis there could be harmful mutual contagion between credit institutions and their sovereign (EBA, 2013, p.26).

This EBA recommendation was taken over in the European Commission's delegated act that specifies the details of the liquidity coverage ratio (European Union, 2015a). All claims on or guaranteed by the central government of a Member State gained level 1 status and count in full (without haircut) towards meeting the liquidity coverage ratio irrespective of the actual market situation. This treatment also applies to sovereign bonds from third countries that enjoy a high credit quality (step 1 in Table 5.1 above). Furthermore, the rules state that liquid asset holdings must always be appropriately diversified per asset class. As another preferential treatment, sovereign-based assets with level 1 status enjoy an exemption from this diversification requirement. Credit institutions are allowed to hold them in their liquidity buffers without limit. Yet, the EU Treaty seeks to subject Member States' borrowing to market discipline based on their individual creditworthiness.

The oversight body of the Basel Committee on Banking Supervision endorsed in January 2013 a number of changes in the proposed liquidity rules for banks. The definition of eligible high-quality liquid assets was broadened with certain corporate debt securities, asset-backed securities and shares, subject to a higher haircut and limit. This should reduce the pressure on banks to hold for liquidity purposes sovereign bonds or marketable securities backed by governments, which in turn relaxes somewhat the close ties between banks and sovereigns. Following an observation period, the requirement for banks to comply with the liquidity coverage ratio should be phased in from 2015 to apply in full from 2019. This gave in particular the fragile banks more time to strengthen their balance sheets. Given the importance attached to a strong liquidity position, EU banking legislation set October 2015 as the starting date and a full implementation of the liquidity coverage ratio already as from 2018.

The EBA Banking Stakeholder Group (2012, p.5) expects that banks will respond by prioritising investments in assets defined as 'liquid' and give lower priority to other assets. Again, this is likely to

raise their demand for government bonds, since these are regarded as liquid by definition (see also IMF, 2012a). Bonner (2016) studies the behaviour of Dutch banks in response to a liquidity requirement already set by the national regulator which was similar in design to the new EU requirement. He finds for the period June 2009 to December 2012 that Dutch banks facing a lower liquidity buffer than required indeed bought more government bonds shortly before the reporting day in order to comply with the national liquidity coverage rule.

Buschmann and Schmaltz (2017) show the dangers of bank regulation that neglects liquidity risks stemming from potential sovereign stress. Euro area banks widely use sovereign bonds as collateral in repurchase transactions and a negative shock from distressed government debt will propagate through this collateral channel and the run-off of bank liquidity may translate in system-wide liquidity stress. They therefore propose to raise the liquidity coverage ratio with an add-on for the actual liquidity risk of the sovereign assets that banks use for securing their repurchase transactions.

c. Net stable funding ratio

Another new element of Basel III introduced in EU banking legislation is the requirement for credit institutions (and systemic investment firms) to maintain a stable funding profile in relation to the composition and maturity of their assets and off-balance sheet activities. The objective is to reduce the longer-term funding risk of banks, i.e. the likelihood that disruptions in regular funding sources could endanger their liquidity position, which in turn could undermine their solvency and cause broader systemic stress. Following a reporting and observation period, during which a credit institution's long-term assets had to be covered with a diversity of stable funding instruments, the so-called net stable funding ratio was expected to become a binding minimum standard by 1 January 2018. The details of the net stable funding ratio were however only laid down by the Basel Committee on Banking Supervision in October 2014 (BCBS, 2014). Following an EBA recommendation, the European Commission (2016) proposes to take them over in EU banking law with some amendments, with full application of the net stable funding requirement expected to be two years after the specific regulation enters into force (at the time of writing this chapter it was still under discussion).

The BCBS defines the net stable funding ratio – which should always be equal to at least 100% – as the available amount of stable funding relative to the required amount of stable funding over a one-year period. Both amounts are calibrated reflecting the stability of a bank's liabilities and the liquidity of its assets. An important assumption is that unencumbered high-quality and liquid assets that can be securitised or traded can easily be used as collateral to secure additional funding or sold in the market and, therefore, do not need to be fully financed with stable funding. Claims on or guaranteed by sovereigns are regarded as extremely high-quality and liquid assets (level 1), in line with the liquidity coverage ratio (see above), and therefore receive a preferential treatment. The BCBS agreed that only 5% of their value needs to be covered by stable funding, irrespective of the actual credit quality and market liquidity of these assets. The European Commission (2016) proposal reduces this stable funding factor to 0% for central government bonds with level 1 status in the EU liquidity coverage

ratio, so as to avoid negative impacts on the liquidity of national sovereign bond markets in the specific European context. This makes it even more attractive for banks to buy and hold sovereign bonds, as these assets make it easier for them to meet the net stable funding ratio than when they would invest in private securities.

d. Large exposures regime

The large exposures regime in EU banking legislation focuses on avoiding concentration risks arising from large asset holdings, i.e. the risk that losses vis-à-vis a given counterparty or in particular instruments could become so large as to threaten a bank's solvency (see Castro and Mencía, 2014). To ensure adequate diversification across counterparties and assets, EU credit institutions and investment firms must keep their large exposures below the maximum of 25% of eligible capital.[41] Governments enjoy a preferential treatment. As claims on the government (or claims carrying their guarante) are perceived to be risk-free and liquid, as before, credit institutions do not face a maximum on their sovereign exposures (Gros, 2013; Weidmann, 2013). At least, the new EU banking rules do ask banks to put in place effective internal controls that address concentration risks, including those arising from large sovereign exposures.

e. Leverage ratio

An important new regulatory tool put forward in the Basel III framework is the 3% minimum leverage ratio (in terms of tier 1 capital relative to gross total asset exposure including off-balance sheet positions), which restricts the build-up of excessive leverage in the banking sector and supplements the risk-based capital requirements with a non-risk based 'backstop' measure. EU banking legislation also introduced the minimum leverage ratio as a new prudential tool in Europe. This entailed a mandatory reporting of the leverage ratio by credit institutions as of January 2014, allowing a qualitative assessment to be made by national supervisors. This was followed by a public disclosure as of January 2015. After further review and calibration the European Commission (2016) proposes to follow the Basel III leverage ratio requirement of 3% and to make it binding two years after the specific regulation enters into force (which was still under discussion when writing this chapter).

A leverage ratio that simply relates a bank's core capital to its non-risk weighted assets has the potential to counter the many uncertainties surrounding a risk-based system of capital requirements and, therefore, also the preferential treatment of claims on the government compared to those on corporations. A bank's sovereign exposures will be fully included in the assets entering the calculation of the leverage ratio, although in the EU context some specialised credit institutions can make particular adjustments. Public development banks may exclude their claims on regional governments, local authorities or public sector entities when these serve to finance public investments. Similarly,

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[41] To make the large exposures regime more risk sensitive, the European Commission (2016) proposes to limit the eligible capital to tier 1, thus excluding tier 2 capital. In addition, it introduces a lower limit of 15% for large exposures of one global systemically important bank to another.

banks may exclude exposures arising from passing-through promotional loans and officially guaranteed export credits from the calculation base. Some credit institutions may have to adjust their portfolios in order to comply with the 3% minimum leverage ratio, in which case changes in public and private sector exposures will generally count the same and do not give rise to a funding privilege for governments (ESRB, 2015).

f. *Reducing the preferential treatment of sovereign exposures for banks*

Looking ahead, several experts have advised European authorities to reduce or eliminate the preferential treatment of sovereign exposures in EU prudential banking legislation, as part of an international agreement (see among others IMF, 2012a; Nouy, 2012; OECD, 2014; Deutsche Bundesbank, 2015; ESRB, 2015; BIS, 2016). Corresponding discussions at the European level and in the Basel Committee on Banking Supervision have started (BCBS, 2017). The main objectives would be to better align the regulatory treatment of credit risk and interest-rate risk, remove regulatory distortions among asset classes, discourage large bank exposures to their own sovereign and improve the incentives for sound fiscal policies. For example, one could phase in requirements that banks apply realistic risk weights to their holdings of government debt, use more cautious liquidity assumptions, hold more stable funding, and/or put a limit on the size of their domestic government bond portfolios or on their overall exposure to European governments. To preserve a level playing field for its own banking sector in global competition it appears that Europe would rather wait for an international agreement in Basel than decide to go ahead with changing the prudential rules for sovereign exposures on its own. As emphasised by Angelini et al. (2014), Castro and Mencía (2014), ESRB (2015), BIS (2016), Lanotte et al. (2016), Lenarčič et al. (2016) and Brunnermeier et al. (2017), implementing these regulatory solutions raises several conceptual and practical questions.

First, variable risk weights for sovereigns make bank balance sheets more immune to fiscal stress but are likely to generate pro-cyclical effects and could have systemic consequences for the economy. Credit risk tends to rise in a downturn. This raises the amount of capital that all banks would need to set aside for their sovereign bond holdings and could reduce the supply of loans to the private sector. Or it could trigger fire sales in volatile bond markets and make government funding more expensive, thereby limiting a country's fiscal space to support the economy. This could actually increase the incentive for governments to apply alternative financial repression solutions.

Second, binding limits on sovereign exposure could constrain banks in playing a role as contrarian investors in the debt securities issued by their own country. During the euro area crisis many European banks (and other financial institutions) increased their holdings of domestic government debt. While this growing sovereign exposure tightened the nexus between banks and their governments, it helped to stabilise national sovereign bond markets at a time when foreign investors retreated from crisis-hit countries. A reduced ability of banks to play this market-supporting role could increase the likelihood that distressed euro area countries have to request assistance from the European Stability Mechanism (ESM) or that the ECB has to intervene in dysfunctional sovereign bond markets.

Third, new rules imposing higher bank capital and liquidity buffers for sovereign risks and/or a maximum on sovereign exposures may hamper monetary transmission. While sovereign and corporate bonds would be treated on a more equal prudential footing and the banking sector would be better protected against the impact from fiscal stress, the higher capital and liquidity charges could hurt bank profits in the short run, reduce bank lending and harm the economy. Government bonds also play a key role as collateral in repurchase transactions. Restricting the size of bank holdings of sovereign debt securities may therefore lead primary dealers and market-making banks to reduce their arbitrage activities. This would reduce bond market liquidity and weaken the transmission of monetary policy further along the yield curve unless non-banks step in to fill the void.

Fourth, abolishing the zero-risk treatment of sovereigns could impair the functioning of euro area financial markets. Making a distinction between euro area governments according to their credit risk would directly affect the banking industry's demand for liquid assets. Since banks need to maintain a sufficient amount of high-quality liquid assets in order to comply with the liquidity coverage ratio, they will shift the composition of their holdings to sovereign debt with low credit risk. Each change in the creditworthiness of a country will lead to further portfolio shifts. While this reflects the operation of market discipline, the liquidity regulation amplifies volatility in sovereign bond markets. Following a concentration limit or a ceiling on all sovereign exposures many banks would also have to downsize their current (domestic) government bond holdings. They may prefer to concentrate their holdings in the most liquid sovereign bond markets of the largest euro area countries making it harder for the smaller member countries to fund their borrowing requirements. The question is whether non-banks are able to absorb this portfolio shift and to prevent a disruption of price formation in capital markets.

Finally, the question comes up how to measure sovereign risk. Since the focus of the G20 has been on avoiding an undue reliance in financial regulation on the assessment by credit rating agencies and the 'cliff effect' associated with rating changes, alternative risk metrics must be found. Gros (2013) suggests assessing a government's creditworthiness on the basis of its public deficit and debt figures and compliance with the excessive deficit procedure of the Stability and Growth Pact. Similarly, Lanotte et al. (2016) propose developing quantitative indicators of fiscal sustainability to assess sovereign credit risk.

Given the special role of sovereign debt as 'safe' asset in the financial system and the pervasive impact of the existing preferential regulatory treatment of government bonds on both sovereign debtors and creditors any limitation should be carefully calibrated and allow for a (long) transition regime – although financial markets are likely to frontload expected regulatory changes. Going beyond changing the EU legislative framework, supervisors could also push banks to contain the risks associated with sovereign exposures, basing their assessments on stress tests and a range of risk metrics. In addition, they could impose more detailed disclosure requirements with regard to banks' sovereign exposures.

The preferential treatment of sovereign exposures and governments' market access is moreover found in a growing body of EU/EMU financial law (see further below). Any regulatory attempt to reduce it would therefore have to take account of the financial structure to avoid regulatory arbitrage and necessitate a carefully crafted common approach at the global level that allows for a (long) period of transition to avoid market disruption.

As noted by Brunnermeier et al. (2017), many of these thorny questions arise from the fact that the euro area has no single safe sovereign asset that could function as the cornerstone of the financial and monetary system. By way of alternative they propose the introduction of European Safe Bonds (called ESBies), an EMU-wide safe asset without joint liability. This safe asset is equal to the senior tranche of a GDP-weighted portfolio of sovereign bonds issued by all euro area countries and is protected by the subordinated junior tranche. The senior tranche would assume the role of anchor of a stable and integrated EMU and, in this regard, constitute an attractive instrument for all financial institutions to meet their capital and/or liquidity requirements as well as the ECB's preferred instrument in the context of the single monetary policy (see the discussion in van Riet, 2017).

2. EU banking structure regulation

The favourable regulatory treatment of sovereign debt can also be found in the proposed EU banking structure regulation of January 2014 that addresses concerns about large banks being "too-big-to-fail, too-big-to-save and too-complex-to-resolve", especially at the national level (European Commission, 2014a). Given the threat that systemic banks pose to the stability of the financial system and the implicit subsidy they enjoy from a potential bail-out by the public sector in times of banking stress it is considered important to improve the resilience of credit institutions and, if necessary, to break them up (see also ESRB, 2014).

The European Commission (2014a) proposal for a regulation therefore contains two key elements. First, it would prohibit major EU banks from carrying out proprietary trading in financial instruments and commodities, i.e. taking speculative positions for making a profit for their own account, with effect from January 2017. Second, if there is a risk of circumvention of this prohibition, it would give the national competent authority the power (or even the obligation) to require from major EU banks that they separate all high-risk investment activities that are not related to their traditional retail financing of the economy and place them in a distinct trading entity. This provision would become effective from July 2018. The European Commission (2014a, p.2) believes that adopting this regulation "will curtail the artificial expansion of banks' balance sheets, particularly those activities of a purely speculative nature, thereby reducing the risk that taxpayers have to step in to save failing banks, and reducing the cost and complexity of any resolution when required".

A notable feature of the Commission proposal is that it exempts the buying and selling of financial instruments issued by Member States from the ban on proprietary trading and from a possible separation of risky trading activities. This exemption is explicitly made consistent with the zero-risk treatment of bonds issued by central and regional governments (as well as the EU and other entities)

under the EU banking legislation (as discussed above), in order to avoid disturbing sovereign debt markets. Again, investments in government bonds are assumed not to pose any credit risk to major banks and accordingly they are unrestricted in taking significant speculative trading positions in sovereign financial instruments, even in those which in the end might harm their balance sheet. While the envisaged structural reform of the EU banking sector would reduce the implicit public sector subsidy to large banks, it would extend the privileged treatment of government debt.

The EU Council determined in June 2015 its position on the draft EU banking structure regulation as a starting point for negotiations with the European Parliament. This position suggests including a clause in the regulation that would mandate a review of the exemption given to trading in government bonds so as to take account of possible new views on the treatment of sovereign risk at the European and international level. At the time of writing this chapter, discussion of the Commission proposal in the European Parliament was still on hold.

3. EU investment funds directive

As regards other financial corporations than credit institutions and investment firms, the EU legal provisions relating to undertakings for collective investment in transferable securities (UCITS) must be considered. The EU investment funds directive – the first version of which (UCITS I) dates from December 1985 – provides an umbrella for asset managers to develop their activities across Europe subject to prudential requirements. As noted by Kopf (2011), the UCITS directive restricts the investment policies of collective investment funds, but offers ample scope for national regulators to exempt government debt from standard exposure limits that apply to private sector instruments.

Already since UCITS I, national authorities may authorise collective investment funds to place up to a maximum of 35% of their net assets (in terms of transferable securities or money market instruments) in instruments issued or guaranteed by a single Member State, its local authorities, a third country, or a public international body to which one or more of the Member States belong. By way of derogation, they can be allowed to invest "in accordance with the principle of risk-spreading" up to 100% of their assets in different transferable instruments issued or guaranteed by one of these public sector bodies, The conditions are that the securities cover at least six different issues of a single issuer, those from any single issue account for at most 30% of total assets and unit-holders must have equivalent protection. Moreover, the authorisation must be expressly mentioned in the fund rules and prominently communicated to the public.

This legal provision compares with a standard counterparty exposure limit of 5% for this type of assets when they are issued by the same private sector entity (or by entities belonging to the same group). This ceiling may be raised to 10% under the condition that the total value of all such assets exposed to the same private sector entity stays within 40% of the value of all the investment fund's assets. UCITS III introduced as from February 2002 the possibility for national regulators to raise the standard 5% exposure limit to 25% for covered bonds issued by a credit institution that is registered in an EU country and is subject to special public supervision to protect the repayment of claims to bondholders.

The total value of such counterparty exposures was in this case restricted to 80% of the value of all the investment fund's assets. This latter addition broadens the regulatory privilege that the UCITS directive bestows on sovereign issuers to banks issuing covered bonds; in both cases, allowing for large exposures constitutes a risk for financial stability.

Considering the applicable concentration limits, collective investment funds may acquire no more than 10% of either all the debt securities or all the money market instruments issued by a single body. Again, national regulators may waive this restriction in case a Member State, a local authority, a third country or a public international body to which one or more of the Member States belong is the issuer or guarantor. Allowing for very large collective investments in assets related to a single public body goes beyond prudent concentration limits and the authorisation of very large sovereign exposures mentioned above goes against the principle of risk diversification. These government funding privileges can nevertheless also be found in the latest edition of the EU investment funds directive (UCITS IV), which entered into force in December 2009 and took effect from July 2011 (European Union, 2009a).

4. EU regulation on money market funds

Money market funds are part of the asset management sector and provide short-term finance to financial institutions, non-financial corporations and governments. Traditionally, they offer to their investors either a variable net asset valuation per unit or share (VNAV funds) that is calculated at marked-to-market prices and therefore linked to money market interest rates; or they aim to maintain a constant net asset valuation per unit or share (CNAV funds) that is based on amortised cost calculations and seeks to preserve the face value of the investment. The vast majority of money market funds in Europe operate under the UCITS directive (see item 3 above), while the others adhere to the Alternative Investment Fund Managers directive. Most of the CNAV funds invest in both public and non-public debt instruments and are domiciled in Ireland and Luxembourg, while the VNAV funds are mostly found in France.

Money market funds are prone to investor runs, as became evident in the United States during the global financial crisis. The risk of a run is highest for CNAV funds in times of volatile markets if investors were to believe that they could fail to live up to the expectation of redemption at par (known as "breaking the buck"). Liquidity shortages at redemption raise concerns about financial stability and the supply of short-term credit to the economy. Following international and European Systemic Risk Board (ESRB) recommendations, the European Commission (2013e) put forward a proposal for an EU regulation on money market funds in September 2013, which after intense political discussions finally entered into force in July 2017 and will apply from July 2018 for new money market funds and from January 2019 for existing ones (European Union, 2017). The main objective of the regulation is to introduce common standards across the Member States that increase the ability of money market funds to withstand redemption pressures in stressed market conditions and thereby protect investors, safeguard financial stability and preserve the integrity of the EU internal market. The common rules

ensure that money market funds only invest in eligible liquid assets and that these are of high credit quality, well diversified and subject to concentration limits. In addition, the regulation seeks to address the risk of regulatory arbitrage that could lead certain banking activities to migrate towards the comparatively less regulated shadow banking system, including money market funds.

The political debate during the legislative process concentrated, among other issues, on the importance of CNAV funds for the short-term financing of EU governments. To deal with the possible incentive for investors to run when the CNAV fund has experienced a modest loss, the ESRB suggested their mandatory conversion to variable net asset valuation, in line with the views of international organisations. The European Commission (2013e) took an alternative route and proposed that CNAV funds could be required to hold a cash buffer of 3% of their assets to absorb market movements. After three years, the Commission would evaluate the functioning of the market of sovereign-related debt in relation to the operation of the cash buffer. Those CNAV money market funds that concentrated their investments in debt issued or guaranteed by the Member States might then in future be exempted from the requirement to build up a cash buffer against market volatility. In addition, it would consider the possibility of creating a special legal framework for money market funds with portfolios concentrated in government-linked debt, given the specific liquidity and credit quality characteristics of these assets as well as the vital role that money market funds play in the short-term financing of Member States.

A study by Europe Economics (2015) indicated that fund operators were not willing to offer CNAV funds with a capital buffer, because of the capital cost involved and the loss of return for investors. The European Parliament in turn suggested that every CNAV fund should either be available exclusively to retail investors (charities, non-profit organisations, public authorities, public foundations and natural persons), or should invest at least 80% of its assets in EU public debt instruments. A capital buffer in these cases was not required. However, the study by Europe Economics (2015) also indicated that restricting the asset diversification in the CNAV market would mean a loss of economies of scale and a lower potential return on assets, whereas short-term yields on EU public debt were already very low or negative. As a result, the take-up of these two restricted types of CNAV funds would likely be limited and the assets invested in CNAV funds was expected to move into VNAV funds or bank deposits.

The final EU regulation on money market funds determines that, in order to mitigate systemic risk, CNAV funds in Europe are no longer allowed to invest in private debt instruments but only in public debt – without restricting this requirement to EU public debt or imposing a capital buffer (European Union, 2017). In addition, it introduces a new low volatility net asset value (LVNAV) fund as a close alternative to a public debt CNAV fund. The Commission is mandated to review within five years the prudential and economic adequacy of the regulation, covering inter alia the role that money market funds play in purchasing debt issued or guaranteed by the Member States, taking into account international and European regulatory developments. In addition, the Commission must report on the feasibility of establishing a quota whereby at least 80% of the assets of public debt CNAV funds are to

be invested in EU public debt instruments, having regard to the availability of short-term EU public debt instruments and whether LVNAV funds might be an appropriate alternative to non-EU public debt CNAV funds which would allow taking them out of the CNAV funds altogether.[42]

This compromise solution combines the two objectives of securing financial stability by preventing CNAV funds from investing in private debt and of keeping CNAV funds voluntarily invested in EU public debt with the option to impose quota later on. A preferential treatment of EU versus non-EU public debt – so it is argued in a recital – is justified from a prudential supervisory point of view, because the issuance of EU short-term public debt instruments is governed by EU law. The establishment of exclusive access for government bodies to short-term credit from CNAV funds as opposed to the private sector is not mentioned.

The EU regulation on money market funds includes several additional provisions that create privileges for EU public debt financing. First, the requirement that money market funds can only invest in eligible money market instruments for which both the issuer and the quality have received a "favourable assessment" does not apply to those instruments issued or guaranteed by a central authority or central bank of a Member State, or by specific European institutions. This provision is beneficial to central governments that do not enjoy a high credit standing. Furthermore, money market funds are explicitly allowed as part of a reverse repurchase agreement to receive non-eligible liquid transferable securities or money market instruments, provided these are issued or guaranteed by a central authority or central bank of a Member State or of a third country, or by specific European institutions, and these have received a favourable credit quality assessment. A lenient interpretation of what constitutes a favourable assessment in this regard might still lead central governments that do not really have a high credit standing to qualify for this derogation.

Second, similar to the UCITS directive, the provisions on the investment policies of money market funds contain derogations for public sector debt, both with regard to the diversification requirement to contain the exposure of money market funds to counterparty risk and the concentration limit to prevent that a money market fund becomes excessively important for a single issuing body. A competent national authority may under certain conditions authorise a money market fund to invest "in accordance with the principle of risk-spreading" up to 100% of its assets in different money market instruments issued or guaranteed separately or jointly by the national, regional and local administrations or central bank of a Member State, a central authority or central bank of a third country, specific European institutions, or other relevant financial organisations to which one or more Member States belong. A limitation in these cases is that the money market fund must hold at least six different issues of a single issuer and the securities from the same issue cannot exceed 30% of its total assets. In addition, the authorisation for such public sector investments beyond the standard limit of 5% of total assets must be expressly mentioned in the fund rules and prominently communicated to the

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[42]   Luxembourg voted against, arguing that EU public debt quota are legally disputable and set a questionable precedent.

public. As in the UCITS directive, certain exceptions to the diversification limit also apply to money market fund investments in secure bonds issued by a single credit institution that is registered in an EU country and subject to special public supervision to protect the repayment of claims to bondholders. As regards concentration risk, a money market fund cannot hold more than 10% of all the money market instruments issued by a single body. However, this maximum does not apply in respect of the holdings of money market instruments issued or guaranteed by single public sector bodies.

In short, the EU regulation creates considerable leeway for national competent authorities when assessing the mutual exposure between money market funds and public sector entities issuing money market instruments. There are nevertheless a few common factors relating to the management of fund-specific risks that mitigate the preferential treatment of public sector versus private sector funding. First, all money market funds are subject to specific portfolio obligations concerning the minimum share of total assets that must mature daily and weekly (although in the latter case, as another exception, a public debt CNAV fund and a LVNAV fund can within limits also include highly liquid assets from public sector bodies with a residual maturity of up to 190 days). Second, each money market fund must undertake a sound stress testing of its capability to withstand the adverse impact of severe economic and financial conditions on the liquidity level or credit quality of its assets and on the possibility that this might trigger large redemptions. Third, both a public debt CNAV fund and a LVNAV fund must publish every day the difference between the constant net value of its assets per unit or share calculated on the basis of the amortised cost method and the valuation derived from a market-to-market or market-to-model calculation. Finally, the management of both a public debt CNAV fund and a LVNAV fund must have prudent and rigorous liquidity management procedures in place. When the liquidity of their money market funds is quickly deteriorating, adequate countermeasures to deal with large redemptions must be considered or have to be initiated. Accordingly, a deteriorating credit quality of a sovereign and a falling market price of its short-term debt instruments will likely hit the liquidity position of money market funds that are heavily invested in its public debt and trigger an appropriate response to contain the risk of redemption pressures.

5. EU prudential legislation for insurance undertakings

European institutional investors tend to have long-dated liabilities on their balance sheets which they seek to cover with long-term assets. High-quality long-term bonds are an attractive instrument for these 'buy and hold' investors because they reduce the duration gap between assets and liabilities. Low-risk government bonds with long maturities are therefore a 'preferred habitat' in their portfolios (see CGFS, 2011). This preference is reinforced by prudential legislation. The successive EU directives for insurance undertakings contain a preferential treatment of sovereign exposures, in particular by allowing national regulators to exempt claims on the government in domestic currency from standard exposure limits that apply to claims on the private sector (in a way similar to the UCITS directive). Just as for banks, the effective scope of this government funding privilege broadened substantially with the introduction of the euro in 1999. According to the prevailing prudential rules,

European institutional investors had to match the currency of their assets and liabilities. As exchange rate risk disappeared, those domiciled in the eurozone could suddenly expand their domestic government bond portfolios to sovereign issuers from the whole monetary union.

The EU directive for insurance undertakings known as Solvency I became law in end-2002 and confirmed this currency matching based on the euro. While it did not set capital requirements, it gave Member States the freedom to introduce their own risk-based frameworks in national legislation. The main sovereign funding privilege remained that investments in central, regional and local government debt could be exempted from the requirement for insurers to diversify their assets. Nouy (2012, p.98) observes that this exemption could be interpreted as an encouragement to hold government debt. At the same time, she notes that insurers were not (or not anymore) constrained by law to invest in domestic government bonds, because this would amount to financial repression.

Under the new EU insurance and reinsurance directive, Solvency II, insurance companies are required to value both their assets and liabilities consistent with market prices. To ensure that they remain solvent with a high probability, they must hold adequate capital against an array of risks related to their investments and operations, the so-called Solvency Capital Requirement (SCR). When an insurance undertaking is unable to meet a certain Minimum Capital Requirement, its authorisation will be withdrawn (see European Union, 2009b). While the Solvency II directive was already proposed by the Commission in July 2007 and entered into force in end-2009, its actual application was postponed (twice) from January 2013 to January 2016 to take account of the new European supervisory architecture, in particular, the establishment of the European Insurance and Occupational Pensions Authority (EIOPA) and the European Securities and Markets Authority (ESMA) as of January 2011. A new, complementary EU directive was needed, providing further details regarding the powers of EIOPA and ESMA (see European Union, 2014a).

During this legislative process, the European Parliament (2012a) argued that, given the sovereign debt crisis, "a zero-risk treatment for government bonds no longer corresponds with economic reality". Therefore, it called in this respect for a more risk-sensitive calculation of the own funds that insurers would be required to hold as a buffer against sovereign exposures, although it cautioned that account should be taken of potentially destabilising effects in periods of market stress. Ludwig (2014) also finds empirically that the zero capital charge for government bonds appears justified for only a few European countries.

The Solvency II directive specifies that the SCR may be calibrated using the standard formula as specified in the legislation, or an internal model approved by the national supervisory authority (for details see European Union, 2015b). Under the standard formula, Solvency II requires insurers to hold adequate capital to cover for the market risk (arising inter alia from interest-rate risk, spread risk, currency risk and concentration risk) associated with their sovereign bond holdings according to their credit ratings. By contrast, claims on or guaranteed by EU central governments issued in their own currency enjoy a capital exemption with regard to the market risk related sub-modules for spread risk

(i.e. the sensitivity to changes in level or volatility of credit spreads over the risk-free interest rate term structure) as well as for concentration risk (stemming either from lack of diversification in the asset portfolio, or from large exposure to default risk by a single issuer of securities or a group of related issuers). The same preferential treatment applies to direct exposures to EU regional governments and local authorities.

Solvency II further includes a similar transitional approach as in the new EU banking legislation (see Table 5.2): until 2017, a capital exemption is also applied for credit spread risk and concentration risk related to those EU sovereign exposures that are denominated and funded in any other EU currency than that of the issuing country, while in the following years this preferential treatment is phased out. As from 2020 in these cases the standard model's computation based on credit quality must be applied. Given the fact that euro area countries share the same currency, insurance companies in the eurozone can by default apply a zero capital charge for concentration risk and spread risk related to all EMU sovereign exposures denominated and funded in the euro.

Many larger insurance groups are instead applying their internal models to compute the SCR and therefore have to make more accurate assumptions regarding the market-related sovereign risks in their portfolio and ensure an appropriate amount of capital to cover for them. As noted by the ESRB (2015), they might still receive approval from their national supervisors to use the same preferential assumptions for EU sovereign exposures as in the standard formula in order to maintain a level playing field among insurers. However, in April 2015, EIOPA issued an opinion against this practice, recommending national supervisory authorities to demand that insurers appropriately cover material sovereign risk in their internal models. Comparing the biased assumptions under the standard formula with more realistic partial internal model calculations of sovereign credit risk, Gatzert and Martin (2012) conclude that the degree of underestimation of the SCR depends on the credit quality of the government bonds and is especially severe for lower-rated sovereigns.

Höring (2013) conducts a review of the literature on the impact of Solvency II on the investment portfolios of insurance companies. He finds many studies expecting a reallocation to less capital-intensive assets and a greater appetite for EU sovereign bonds issued in domestic currency. This shift should favour in particular lower-rated government debt, high-rated covered bonds issued by banks and short-term, high-quality corporate debt at the expense of long-term unsecured bank bonds, long-term corporate bonds of lower credit quality, equity and illiquid investments. Düll et al. (2015) confirm this anticipated response and document a bias towards investing in domestic government bonds for 17 large European insurance companies based on data for the period 2009:Q4 to 2013:Q1. The CGFS (2011) comes to the same conclusion, expecting that the tendency of insurers to economise on capital charges and to limit the duration gap could contribute to lower long-term interest rates and flatten the term structure for sovereign bonds relative to private credit with a less favourable regulatory treatment.

Wilson (2013) warns that having a diversified portfolio is ever-more essential for European insurers, because in retrospect the earlier build-up of high concentrations in sovereign bonds was imprudent. The rising sovereign spreads had a direct negative impact on their valuation and an indirect adverse impact on the value of bank bonds that are highly correlated with sovereign risk. Moreover, the environment of steadily falling risk-free interest rates (possibly induced by financial repression) meant a rising discounted value of long-term liabilities. The combined effect of these three factors has undermined the share price of life insurers. Düll et al. (2015) show in this respect that market expectations of the default risk of insurance companies are positively correlated with the riskiness of their sovereign bond portfolios. This finding would justify introducing a capital buffer against all the market-related risks from sovereign exposures to absorb potential losses.

Wilson (2013) also recommends stronger prudential incentives for insurer undertakings to tighten their risk management practices. Solvency II indeed enhances governance and risk management and explicitly asks insurance companies to invest all their assets in accordance with the 'prudent person' principle so as to ensure the security, quality and liquidity of their portfolios. This also applies to investments in European government bonds. In addition, they are obliged to conduct an adequate own risk and solvency assessment, also in those cases where the standard formula for the calculation of credit and market risks allows them to consider government bonds as risk-free. Since all assets covered by this assessment are to be valued at market prices, insurers have to take account of the credit and market risks related to all their counterparties, also those for governments.

6. EU prudential legislation for occupational pension funds

A European prudential legislative framework for occupational pension funds was established in 2003 with the EU directive on the activities and supervision of Institutions for Occupational Retirement Provision (IORP). The 'prudent person' principle guided investments, an approach which allowed flexibility for pension funds to invest their assets in the best interest of members and beneficiaries, while obliging them to act prudently. This meant inter alia ensuring a proper diversification to avoid excessive reliance on any particular asset or issuer and prevent the accumulation of risk in the portfolio as a whole. Member States were given discretion on the precise investment rules that they wanted to impose, provided that these did not restrict the free movement of capital, unless this could be justified on prudential grounds.[43] The investment rules applied at the national level could be made more stringent, but could also entail a preferential treatment of government debt. Similar to Solvency I, national regulators could decide to exempt investments in government bonds from diversification requirements, thereby offering occupational pension funds the opportunity – if not an incentive – to create a substantial exposure to sovereign risk. However, Member States could generally not require them to invest in a particular category of assets, such as domestic government bonds, whereas this had been quite common in the past.

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[43] Darvas and Schoenmaker (2017) show on the basis of OECD survey data that most EU countries placed very few foreign investment restrictions if any on private pension funds as early as 2001 or relaxed these constraints in subsequent years.

After the introduction of Solvency II, to ensure a level playing field with insurance undertakings offering pension products, the European Commission (2010b) suggested that also occupational pension funds should hold sufficient capital based on a market-consistent, risk-based framework. Originally, the Commission planned to extend the preferential capital treatment of government exposures in Solvency II to the new solvency requirement for occupational pension funds to be introduced in a recast of the IORP directive (IORP II). Following critical comments from stakeholders, however, it decided in May 2013 to defer the introduction of a harmonised solvency rule for occupational pension funds. The IORP II directive that was agreed in mid-2016 instead focuses inter alia on improving risk management and enhancing information for pension scheme members.[44]

As shown by Amzallag et al. (2014), imposing a solvency requirement could lead occupational pension funds to rebalance their portfolios in favour of low-risk assets, including government bonds. The authors also report that already the announcement of the possible introduction of a new solvency rule caused some de-risking of pension fund portfolios towards fixed-income instruments.

While a regulatory capital advantage for government bonds might increase their relative attractiveness, in a low interest rate environment they still only offer a low yield. More risky asset classes such as equity tend to have a correspondingly higher expected return and may still be interesting for diversification purposes, especially when it is high enough to compensate for a relatively high required amount of solvency capital. Therefore it is important to compare the risk-return profile of the whole portfolio before and after the introduction of a capital requirement (Allianz Global Investors, 2013).

7. *EU market infrastructure regulation*

Following a G20 agreement, EU legislation has also been implemented to increase the transparency of over-the-counter (OTC) derivative contracts such as credit default swaps, reduce the uncertainty about the risks involved in derivative transactions, protect against market abuse, and thereby allay the related financial stability concerns. The European Market Infrastructure Regulation (EMIR) of August 2012 (European Union, 2012b) requires 1) the reporting of all derivative contracts to trade repositories, making them accessible to supervisory authorities; 2) the clearing of all standardised OTC derivative contracts through a central counterparty and liquid, high-quality collateral assets to be posted by the parties to both centrally and non-centrally cleared derivative contracts; and 3) the implementation of stringent organisational, business conduct and prudential rules for the central counterparties.

EU public bodies and central banks charged with intervening in the management of public debt are excluded from the scope of this market regulation "in order to avoid limiting their power to perform their tasks of common interest" (European Union, 2012b, p.6). The same treatment is awarded to the

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[44] On its own initiative, EIOPA undertook further technical work, using the tool of a 'holistic balance sheet' to assess the solvency of occupational pension funds. EIOPA recommended the EU institutions in April 2016 to introduce a common framework for analysing the impact of predefined stress scenarios on a market-consistent balance sheet of occupational pension funds and disclosing the outcome of this risk assessment to the public, to be followed by national supervisory action if deemed necessary. However, it did not advise on harmonising capital or funding requirements.

BIS, EFSF, the ESM, multilateral development banks, as well as to specific public sector entities that are owned by central governments and have explicit guarantee arrangements from them. For reasons of international coherence and consistency, the same exemption is being extended to public bodies and central banks outside the EU to the extent that these enjoy a similar treatment in their national legislation (European Commission, 2013c).

EMIR in this respect avoids any interference in the operation of independent central banks using government securities for the conduct of monetary policy in derivative markets. Placing similar activities of public debt management offices on one line with those of central banks, because these must be coordinated for efficiency reasons (see European Commission, 2013c, p.12), appears to assume that the two public bodies still are (or should be) closely intertwined.

EMIR has contributed to more clearing taking place via central counterparties. A central counterparty can only accept highly liquid collateral with minimal credit and market risk to cover the initial and ongoing exposure to its clearing members. The legal provisions and regulatory technical standards specify the exact types of highly liquid collateral, i.e. cash, financial instruments, bank guarantees and gold (see ECB, 2013). For financial instruments to qualify, they should normally be debt instruments issued or explicitly guaranteed by a government, a central bank, or a supranational institution.

EMIR also defines a framework for determining valuation haircuts and collateral concentration limits to restrict exposure. Central counterparties are required to establish prudent valuation practices and develop haircuts that are regularly tested and that take into account stressed market conditions. Some of them impose minimum credit rating standards for the acceptance of collateral assets. The concentration limits differ across the various arrangements. For example, they may set a maximum for a certain rating per category of collateral in the basket, or set a limit on the share of certain issuers (such as regional governments) of the assets in the collateral basket.

As explained by Levels and Capel (2012) and Houben and Slingenberg (2013), EMIR will raise the net demand for liquid, high-quality collateral assets, including sovereign bonds. This may contribute to easing government funding constraints, especially when the additional regulatory demand for this type of assets due to EMIR and other EU legislation (as discussed in this chapter) is structural and would exceed the growth in supply.

As regards the prudential rules applicable to central counterparties, the European Commission has issued regulatory technical standards to ensure that these financial intermediaries are at all times safe and sound and hold sufficient capital against a range of risks (except those risks stemming from clearing activities that are largely covered by specific financial resources). Since these risks are similar to those of credit institutions and investment firms, the capital standards in EU prudential banking legislation serve as the relevant benchmark. For credit risk, the standardised approach must be applied, indicating that the preferential treatment of sovereign exposures in the banking sector (as discussed above under item 1) is extended to central counterparties.

8. European financial transactions tax

There have been many calls by politicians and civil society groups to counter excessive market activity and stabilise financial markets by establishing a tax on financial assets or transactions. After the financial crisis it gained popularity as an instrument to discourage socially unproductive financial transactions, recoup some of the public funds spent on bailing out the banking sector, or to fill bank resolution and deposit insurance funds (IMF, 2010; Botsch, 2012; Burman et al., 2016; Hemmelgarn et al., 2016; Kastner, 2017). Given open capital markets, however, the effectiveness of national tax initiatives depended on all European financial centres or EMU countries joining in.

Following a request from the European Parliament, the European Commission (2011a) put forward a proposal for an EU-wide financial transactions tax (FTT). The main objectives were to counter excessive market activity, contribute to avoiding future financial crises and ensure that financial institutions (also compared to other sectors) make a fair and substantial contribution to covering the fiscal costs of the crisis. The initiative was also meant to avoid that the single market for financial services gets fragmented by uncoordinated national indirect taxation of financial transactions. A suggestion to add the revenues to the EU budget received a cool reception in national capitals.

As many Member States were opposed to such a uniform tax, the European Commission (2013a) proposed instead the introduction in January 2014 of a common financial transactions tax in 11 euro area countries (Belgium, Germany, Estonia, Greece, Spain, France, Italy, Austria, Portugal, Slovenia and Slovakia) that had expressed their willingness to go ahead with this tax under the so-called enhanced cooperation procedure (see also Hemmelgarn et al., 2016; Kastner, 2017). The harmonised tax regime would be applied at each stage of a financial transaction and through each financial intermediary, covering secondary-market transactions in shares, bonds and derivatives while excluding primary market activity. Transactions undertaken for the purpose of monetary policy, public debt management and some international public policies would be exempted, as well as foreign exchange trading in the spot market (to preserve the free movement of capital) and day-to-day financial transactions of households and firms. Further provisions aimed to avoid tax evasion, distortions and transfers to other jurisdictions.

Some of the participating countries indicated the wish to exclude trade in government debt securities from the scope of the financial transactions tax, a view which was strongly supported by public debt management offices. This exemption would, however, create an arbitrary cost advantage for secondary market purchases of public sector debt compared to alternative financial instruments. As a transitory alternative option, the European Parliament (2013) suggested to limit the tax rate on government bond transactions to only half of the standard rate for a few years. Additionally, it proposed to apply that reduced tax rate until the same end-date to all financial trades by pension funds. Other policymakers suggested to exempt pension funds altogether from the financial transactions tax, to avoid that

pensioners would get hit by the higher costs of trading (Botsch, 2012). For a level playing field, such a tax advantage would then have to be extended to life insurance companies.[45]

Advocates of a comprehensive approach countered that a financial transactions tax could nudge asset managers further towards 'productive' longer-term investment strategies and that pensioners would also benefit from the broader effect of more stable financial markets (Gray et al., 2012). By contrast, active lobbying by the financial industry in cooperation with business groups highlighted the economic costs of taxing funding markets for the corporate sector (Kastner, 2017). France and Italy then promoted a narrow tax base at the European level, covering shares and derivatives only, in line with their recently introduced national schemes (see Section 4.4.1).

Acknowledging the need for further technical work the participating euro area countries committed in May 2014 to implement the harmonised financial transactions tax in a progressive manner. As a first step, they planned to start with the taxation of shares and some derivatives on 1 January 2016, allowing each further step towards full implementation to take due account of the economic impact. A negative impact on the real economy and on pension schemes was to be minimised. As both public sector and private sector debt securities would not be part of the tax base, the extent of the implied sovereign privilege would be more limited than in alternative proposals. Regarding derivatives, it was agreed that the tax rate should be low but based on the widest possible tax base, without impacting the cost of sovereign borrowing. This suggests that derivative contracts for sovereign bonds might be (temporarily) exempted from the tax. Estonia decided to step out from the planned introduction, because with the envisaged small tax base it expected the costs to be higher than the benefits. After several delays, in December 2016, politicians could still not agree on the final modalities of the financial transactions tax and its introduction was again postponed.

5.3.2 Crisis management measures

Following the financial crisis, EU financial market legislation has been tightened in several respects, in ways which also benefit governments in times of funding stress. In addition, official rescue funds and market intervention facilities have been created or announced that ease fiscal stress.

1. EU regulation on credit rating agencies

Credit rating agencies provide an important service to the market: by rating private debt instruments they help to reduce information asymmetries that exist between borrowers and lenders. The added value of sovereign credit ratings is less obvious, since investors in government debt securities can mostly draw on public information. Since the financial crisis credit rating agencies have come under severe criticism from policymakers for having underestimated the credit risks associated with structured financial products. They have also received critical comments for downgrading distressed euro area countries, even after these had just committed to serious policy adjustments that improved

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[45] See European Commission (2013b) for a discussion of alternative options for the scope of the financial transactions tax.

their fundamental outlook. Eijffinger (2012) concludes in this respect that rating agencies generally lagged behind markets in their judgement.

Following the financial crisis, three EU regulations affecting the operations of credit rating agencies in Europe have been adopted. Those registered in the EU were first placed under stricter authorisation requirements and new rules of conduct applicable in full from December 2010. A subsequent amendment of the regulation brought them under exclusive supervision by the European Securities and Markets Authority (ESMA) as from July 2011 (European Union, 2011). Further EU legislation in force since June 2013 seeks to reinforce the independence of credit rating agencies, enhance the transparency and quality of credit ratings, reduce the risk of over-reliance on external credit ratings, limit the high degree of concentration in the rating market, and control the risks associated with the business model of rating agencies. In addition, it introduces a right of redress for investors in and issuers of financial instruments (European Union, 2013b,c).[46]

This new EU legislation also made credit rating agencies subject to specific requirements for sovereign ratings. They have to publish annually at the end of December a calendar for the next 12 months setting two or three dates for issuing unsolicited sovereign ratings and rating outlooks, from which they can only deviate for legal reasons. Sovereign ratings must be accompanied by detailed research reports explaining the assumptions, perceived risks and other key elements on which they are based. While specific national policies may constitute one of these elements, rating agencies are to refrain from giving policy recommendations to a country. Governments are also given more time (a full working day instead of just 12 hours) to react to a change in their credit rating before this is made public, so that they can better verify the underlying data, which must have been taken from generally accessible sources. When a rating agency breaches the obligations, it may be held liable for damages caused intentionally or with gross negligence.

Commission staff also examined the policy option of granting ESMA the power to restrict or ban temporarily the issuance of sovereign credit ratings (see European Commission, 2011b, p.34). This could become relevant, in particular, when exceptional events could trigger contagion and excessive market volatility or when complete information on timing, amount and conditions of EU/IMF financial support to stabilise the economy of a troubled member country was still missing. The study also considered the option of a permanent prohibition of sovereign credit ratings (see European Commission, 2011b, p.34). For clearly defined exceptional circumstances a temporary suspension was regarded as an acceptable precautionary measure of last resort, although its effectiveness was probably limited. By contrast, a permanent prohibition was considered to be in conflict with the fundamental freedom to conduct a business and the principle of proportionality. None of these repressive policy options were in the end seriously considered, as 'shooting the messenger' for the bad news on a country's credit standing was no solution to the underlying fiscal problem.

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[46] For a legal and economic analysis see de Haan and Amtenbrink (2012).

While there are legitimate concerns with how credit rating agencies operate, the impression is that policymakers wanted to 'punish' them for unduly downgrading euro area sovereigns. According to Körner and Trautwein (2015), the risk assessments of credit rating agencies indeed appear to contain a biased judgement of the implications of EMU membership. EU countries joining the euro experienced a more favourable treatment of their euro-denominated debt than other OECD countries, apparently because their credit rating disregarded the fundamentally higher default risk of their giving up control over the currency in which they normally issue public debt. After the sovereign debt crisis, in contrast, the credit ratings of the vulnerable eurozone countries included a penalty for their EMU membership. During 2012-2014 the credit rating agencies were in any case more conservative in their credit risk assessment of crisis-affected euro area countries than before the sovereign debt crisis (de Vries and de Haan, 2016). This greater caution may also be due to the stricter EU legislation, the supervision by ESMA, or a deliberate strategy of credit rating agencies to regain their reputation. Whatever the explanation, a more conservative rating will only have a limited impact on the incentives of policymakers, as long as market views reflected in sovereign bond yields and credit default swap (CDS) spreads are more favourable than credit ratings.

On balance, any government funding advantage resulting from the EU's tightening of oversight of rating agencies and imposing rules for issuing sovereign credit ratings is likely to be moderate. The potential benefits in times of liquidity stress may be partially outweighed by the recent tendency among rating agencies to under-rate the weaker countries participating in EMU compared to their OECD peers.

2. EU regulation on short-selling and credit default swaps

Speculators are another typical target of the authorities in times of market stress. As the financial crisis and sovereign debt crisis intensified, several euro area countries introduced emergency measures to counter excessive speculation by announcing a temporary restriction or ban on short-selling in certain market segments. Short-selling is the practice of investors to sell borrowed securities (including sovereign bonds) with the intention to cover their positions later by repurchasing them at a lower price. This draws concern from regulators, as short-selling is seen to artificially drive prices to lower levels and spur market volatility during a crisis. Also attempts by investors to protect themselves against losses on sovereign debt by purchasing credit default swaps (CDS) are sometimes associated with higher government bond yields. In particular, naked (= uncovered) short-selling and buying of sovereign CDS is often seen as contributing to negative price spirals and disorderly markets.[47]

A new EU regulation (European Union, 2012a) harmonised with effect from November 2012 the rules for short-selling and certain aspects of credit default swaps and conferred powers of coordination and

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[47]   On 8 June 2010, the French President and the German Chancellor sent a joint letter to the President of the European Commission asking the Commission to come forward with a legal proposal to ban naked short-selling and naked sovereign CDS purchases.

intervention on the European Securities and Markets Authority (ESMA).[48] The common regulatory framework gave national competent authorities the possibility to prevent short sales during periods of market stress, introduced a reporting requirement for net short positions above specific thresholds for European shares and sovereign bonds, restricted uncovered short-selling of shares and debt instruments, and prohibited uncovered sovereign credit default swap positions in view of their speculative nature. A safeguard clause allows the national competent authorities to suspend the regulation temporarily if the restrictions on sovereign credit default swaps were found to lead to a significant decline in the liquidity of the sovereign bond market. With regard to hedging, market making activities in general and operations of primary dealers in sovereign debt are exempted from the new requirements.

Arguably, uncovered positions pose a danger of settlement failure and market disruption and should be restricted or banned. However, short-selling also supports market efficiency in terms of liquidity, risk allocation and price formation. As argued by the public debt managers of OECD countries (Blommestein, 2010), the ability to manage risk through short-selling operations supports a better functioning of both primary and secondary markets for sovereign instruments. A restriction of uncovered short-selling of government bonds could lead investors to demand a higher risk premium and increase borrowing costs.

Also the new legal requirement that only investors who actually hold EU government bonds (or meaningfully correlated private sector instruments) are allowed to buy protection against sovereign default could reduce market volumes (IMF, 2013). Trades in sovereign credit default swaps have become dependent on investors that are willing to buy the underlying government bonds and wish to hedge against the risk of losses. The more speculative traders have to turn to unrestricted proxy markets (for example, using futures contracts on sovereign debt, or CDS contracts on financial firms that are correlated with a country's credit risk) in order to place their bets on European sovereigns. This could have the unintended effect of causing dislocations in these other markets and undermining financial stability. A reduced liquidity in the market for sovereign debt protection, moreover, raises the cost of hedging and could drive up the cost of sovereign debt issuance.

Overall, this EU regulation may be seen as constraining or even preventing market participants from expressing a negative view on the creditworthiness of sovereigns, and as another example of "messenger shot, message not" (The Economist, 2012, p.64). Already in the run-up to the date of its introduction, the unwinding of net short positions in sovereign debt reportedly contributed to a decline in government bond yields. The longer-term impact of the short-selling restrictions may, however, be a higher cost of government funding (Blommestein, 2010). In addition, the IMF (2013) observed that the phasing out of all uncovered positions in European sovereign credit default swaps coincided with a

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[48] The European Court of Justice confirmed in January 2014 that the ESMA has its own discretionary powers to adopt emergency measures on the financial markets of the Member States in order to regulate or prohibit short selling in the pursuit of the EU objective of financial stability (ECJ, 2014).

material decline in spreads and reduced market liquidity, although other factors may also have played a role. A first review by the ESMA (2013a,b) noticed a slight decrease in Member States' sovereign CDS spreads after the introduction of the prohibition on uncovered sovereign CDS transactions. The liquidity of EU sovereign CDS markets was in general not adversely affected, although CDS markets for specific Eastern European countries experienced a significant deterioration. The CDS indices on groups of EU sovereigns (the purchase of which now requires investors to hold the underlying bonds of all countries represented in the index) saw a significant decline in liquidity.

3. *Euro area stabilisation mechanisms*

The sovereign debt crisis that started in Greece in late 2009 led to the creation of two new euro area stabilisation mechanisms, the temporary European Financial Stability Facility (EFSF, incorporated in June 2010 to replace the ad hoc bilateral loan facility for Greece) and the permanent European Stability Mechanism (ESM, inaugurated in October 2012) as a complement to the loan facilities offered by the International Monetary Fund (IMF) and any bilateral loans from Member States outside the eurozone.[49] These fiscal backup mechanisms were established to provide financial support under strong policy conditions to euro area members facing financial strain (the EFSF only until June 2013) and established a 'firewall' against contagion of fiscal stress from one country to the next. The two funds were endowed with a combined lending capacity of temporarily up to EUR 700 bn. (o/w EUR 500 bn. on a permanent basis for the ESM) that may be used for conditional loans or precautionary credit lines, provided that the government debt position of the country concerned is assessed to be sustainable in the longer run.

Greece, Ireland and Portugal benefited from EFSF financial assistance and Greece and Cyprus received ESM support, in all cases complemented by IMF loans, whereas Spain received ESM funds specifically for (indirect) bank recapitalisation purposes (for an overview see Henning, 2017). Greece initially had to accept close to market interest rates and a 5-year maturity on its bilateral loans from partner countries. Subsequent concessions substantially eased the lending terms on its European official loans as these arranged for lower financing costs, longer maturities, deferred interest payments and an extended grace period (see Corsetti et al., 2017). The 'soft debt restructuring' arranged for Greece also implies that its debt service obligations to the EFSF/ESM over the period until 2023 are minimal. The concessional interest rates that all programme countries enjoy on their European official loans allow them to benefit from the high credit ratings that the EFSF and ESM enjoy in the capital market, which make this source of exceptional funding affordable.[50] As shown in Table 5.3, the granting of EFSF/ESM loans has resulted in substantial direct and indirect budgetary savings for the

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[49]   In addition, a European Financial Stability Mechanism (EFSM) was established in May 2010 under which the European Commission can borrow up to EUR 60 bn. in the market on behalf of the EU for lending to Member States facing severe economic or financial disturbances. EFSM financial assistance is also subject to strong policy conditionality.

[50]   Note that the Basel Committee on Banking Supervision has agreed that national supervisors may allow banks to apply a zero-risk weight to claims on the EFSF and the ESM.

programme countries. Most of them have therefore asked and received permission to first repay their more expensive IMF loans.

As euro area 'fire brigades' the EFSF and ESM have also been given the mandate to provide market access support by suppressing unsustainable sovereign bond yields and volatility in primary or secondary government bond markets when the lack of liquidity could threaten financial stability. These facilities should help to prevent that solvent euro area countries with funding difficulties loose market access and need an EFSF/ESM loan. By creating incentives for private investors to stay in the market, these preventive interventions also support continued market discipline on countries to follow their adjustment path (Vanden Bosch, 2012). The capacity of the EFSF in this respect was leveraged by the ability to offer private investors partial risk protection certificates and the opportunity to participate in co-investment funds, while for the ESM this is under consideration. These two options could be used to further support market access for countries within a full or precautionary programme.

Table 5.3 – Budgetary savings for euro area programme countries related to EFSF/ESM loans (percent of GDP)

Programme country	2011	2012	2013	2014	2015	2016	2060 [1]
Ireland	0.1	0.3	0.3	0.3	0.3	0.3	
Greece – total	0.0	1.6	4.1	5.0	5.3	6.3	± 20.0
o/w EFSF		1.6	3.7	4.3	4.4	4.8	
Deferred interest			0.4	0.7	0.7	0.7	
ESM					0.2	0.8	
Spain		0.0	0.2	0.2	0.2	0.2	
Cyprus			0.1	0.2	1.9	2.1	
Portugal	0.1	0.4	0.6	0.7	0.7	0.7	

Source: ESM (2017, p.49). Direct budgetary savings are calculated per loan disbursement by comparing the spread between a country's 10-year bond yield capped at 6.4% and the effective interest rate paid on EFSF/ESM loans. The indirect budgetary savings are calculated in the same way, comparing for every loan disbursement the cost for the government of refinancing in the capital market with the applicable lower costs of EFSF/ESM refinancing.

Note 1): Refers to the cumulative impact up to 2060 of EFSF/ESM short-term debt relief measures for Greece endorsed by the Eurogroup on 5 December 2016.

The facility for primary market support can be used to complement either regular EFSF/ESM loans or a draw-down of funds under precautionary assistance. The intervention amount is maximised by the requirement of a sufficient participation of private investors in government bond issues, i.e. the EFSF/ESM will not purchase more than 50% of each issue unless this is needed to reach at least half of the originally targeted amount. A primary market intervention will, as a rule, be conducted at the prevailing market price although the corresponding interest rate cannot be at a level which is excessively above the own funding rate of the EFSF/ESM. On balance, this set-up preserves a significant role for market signals.

The conditional support for secondary market access depends on an assessment of whether price dynamics are destabilising and require a pre-emptive intervention to support the proper functioning of specific government debt markets. The EFSF/ESM will be able to use the ECB as their fiscal agent to ensure an efficient conduct of their secondary market operations. They must also consult with the ECB on whether there are exceptional market circumstances that constitute a risk for financial stability. Accordingly, the ESM might use its secondary market interventions to suppress unsustainable bond yields below their 'fair value' and to unduly constrain market discipline on beneficiary countries.

4. ECB sovereign bond market interventions

The sovereign debt crisis and the consequent market access difficulties for affected governments also caused a growing fragmentation of euro area financial markets along national lines, which seriously impaired the monetary transmission mechanism. The ECB responded with temporary and limited interventions aimed at repairing the dysfunctional secondary markets for government bonds. Under the Securities Markets Programme (SMP) it purchased a total of EUR 219.5 bn. of long-term sovereign bonds between May 2010 and March 2012 (see Table 5.4). This exceptional monetary policy measure created a more favourable market environment for governments in distress and, for that reason, was accompanied by public opposition from within the Governing Council of the ECB. Empirical studies suggest that the SMP had a positive, albeit short-lived effect on the functioning of the targeted sovereign bond markets by reducing liquidity premia and lowering the level and volatility of yields (Manganelli, 2012; Pattipeilohy et al., 2013; Gibson et al., 2016).

Table 5.4 – Breakdown of the Eurosystem's SMP holdings as at 31 December 2012

Issuing country	Outstanding amounts (EUR billions)		Average remaining maturity (in years)
	Nominal amount	*Book value* [1]	
Ireland	14.2	13.6	4.6
Greece	33.9	30.8	3.6
Spain	44.3	43.7	4.1
Italy	102.8	99.0	4.5
Portugal	22.8	21.6	3.9
Total	**218.0**	**208.7**	**4.3**

Source: ECB press release of 21 February 2013.

Note 1) The SMP holdings are classified as held-to-maturity and consequently valued at amortised cost.

The benefit for governments was, in particular, that it managed to calm down markets somewhat during severe tensions. This bought them some time to put in place a credible reform programme. Although the SMP was not subject to explicit conditionality, the ECB (2010) took note of the commitments taken by the beneficiary countries to accelerate fiscal consolidation and ensure the sustainability of their public finances. In addition, it was accompanied by direct communications between the ECB and the national authorities. This signalled that the implied moral hazard of the

beneficiary governments was to be prevented. Since the only objective of the SMP was to support price discovery in dysfunctional sovereign bond markets and restore the monetary transmission process, the ECB decided to keep the government bonds purchased in its portfolio until they mature and sterilise their liquidity impact. This sterilisation was discontinued in June 2014, to prevent an undue tightening of euro area liquidity conditions at that time.

Following the ECB president's pledge on 26 July 2012 to do "whatever it takes" to preserve the euro, within the limits of the ECB's mandate, the SMP was replaced in September 2012 by a commitment to undertake unlimited Outright Monetary Transactions (OMT) in disrupted government bond markets. The purpose of the OMT is to safeguard a homogeneous transmission of monetary policy and to address the severe distortions in sovereign bond yields originating from unfounded fears of a break-up of the euro (ECB, 2012a). Any interventions will focus on government securities with a residual maturity of 1 to 3 years, which is closest to monetary policy operations. The liquidity injected will be fully sterilised. The use of this monetary backstop is conditional on strict and effective compliance with a full macroeconomic adjustment programme associated with a loan from the EFSF/ESM or the enhanced policy conditions of a precautionary credit line from the EFSF/ESM. The agreed programme must include the possibility of primary market purchases of sovereign debt by the EFSF/ESM. The OMT may also be used for countries that are still under an adjustment programme when they have regained access to the government bond market. For the design and monitoring of the country-specific conditionality the involvement of the IMF will be sought.

As argued by the ECB, potential public debt purchases under the OMT serve as an instrument that enables it to achieve price stability in line with its monetary policy mandate (ECB, 2012b). The ECB moreover decides in full discretion on the start, suspension or (dis)continuation of the OMT.[51] According to Cœuré (2012), this pushes back the risk of fiscal dominance, i.e. the fear that in extremis the ECB may be forced to divert its monetary policy away from maintaining price stability towards preventing outright sovereign defaults. The European Court of Justice (ECJ, 2015) broadly accepted this line of reasoning in its Opinion on the OMT and the German Federal Constitutional Court (2016) went along with this view, while giving its own interpretation to the conditions (see Section 3.5.2).

The focus on eliminating the 'tail risk' of a belief-driven fiscal crisis in government bond markets leaves ample room for market participants to exercise discipline on sovereigns. In addition, the requirement of policy adjustments works towards improving the country's economic prospects and restoring fiscal sustainability, which prevents that a troubled country might default on the debt securities acquired by the ECB and cause considerable credit losses. Moreover, the ECB officially accepted the same (pari passu) treatment as other creditors with respect to its OMT purchases (as is

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[51] The German Finance Minister, Wolfgang Schäuble, remarked in spring 2014 (in the run-up to elections for the European Parliament) that the ECB cannot on its own decide to initiate the OMT because it requires an ESM programme. ESM decisions are subject to mutual agreement (i.e. a unanimous vote of the euro area governments or a qualified majority of 85% of the votes in case of an emergency). He raised doubts that the German government would approve ESM assistance if it was associated with ECB sovereign bond purchases under the OMT.

common for its other open-market operations) and thus the attendant sovereign credit risks, thereby avoiding a seniority status that could disrupt normal market functioning. Hence, it may be forced to accept losses through the majority decision of all creditors when a collective action clause is activated.

Corsetti and Dedola (2013) and Corsetti (2015) argue that a sovereign default driven by fundamentals remains a distinct possibility. Substantial open-market purchases to stabilise a speculative investor run on national sovereign debt increases the ECB's exposure to default risk. A sovereign default may compromise its price stability objective and, for this reason, open-market interventions are on their own not fully credible as a monetary backstop. To support its continued credibility as an inflation-fighter, they point out that the ECB must in turn receive a fiscal guarantee against such losses. However, EMU has no euro area treasury. A fiscal indemnification for the ECB's non-standard monetary operations provided by the national authorities would amount to sovereign risk-sharing whereas the EU Treaty explicitly excludes that member countries assume each other's liabilities.

Altogether, the design of the OMT shows that the ECB's interventions in conjunction with those of the EFSF/ESM addressed dysfunctional government bond markets while preserving market signals on a country's creditworthiness. The mere announcement that the ECB stood ready to act as a potential 'buyer of last resort' was credible to the markets and was instrumental in countering market fears of a euro area break-up, removing the currency convertibility risk premium and lowering the sovereign bond yields of troubled countries to more sustainable levels (see Altavilla et al., 2014; Acharya et al., 2016). The increase after mid-2012 in the market value of these sovereign bonds on the balance sheet of fragile banks improved their financial health and restored private funding flows towards the banking sector. This recovery in turn made countries with weak public finances less exposed to additional bank rescue operations and mitigated the bank-sovereign nexus.

Overall, the financial backstops for euro area countries in distress help to prevent destabilising market forces spreading out throughout the euro area. To counter the associated moral hazard, this support is conditional on strict and effective compliance with country-specific policy adjustments. The programme countries have undertaken substantial fiscal consolidation, worked on restructuring their fragile banks and made considerable progress with structural reforms. All troubled countries that received official support completed their three-year adjustment programme and were able to return to the capital market for their funding needs (at the time of writing with the exception of Greece, although it was occasionally successful in accessing the capital market, as discussed in Section 4.3.2).

On a more critical note, Buiter and Rahbari (2012) argue that the massive disruptions of a possible exit of a member country from the euro area or a break-up of the single currency might well force the creditor countries and the ECB to assist troubled debtor countries for as long as needed. As they see it, the repeated commitment of the official lenders to preserve the euro effectively created a political disincentive for programme countries to fully implement the agreed policy measures – even though EFSF/ESM support is assessed each time when a new loan tranche or credit line is to be paid out. This is visible in the fact that in all cases the original fiscal targets were not met due to a deteriorating

economy and the deadlines for meeting them were subsequently relaxed. Moreover, agreed structural reforms often took long to be passed into law and national regulators also allowed the many banks with non-performing loans on their balance sheets to roll them over.

5. Potential capital market restrictions

The rising interest in curbing financial markets to ease fiscal stress was also reflected in proposed amendments of the European Parliament (2012b) during the debate on the new European Union (2013a) regulation on enhanced surveillance of euro area countries facing financial stability risks.

First, to facilitate market access, the European Parliament argued that the stressed government should be enabled to take all necessary measures to encourage private investors to maintain their overall exposure on a voluntary basis. Second, the countries concerned should be allowed to initiate measures aimed at stabilising markets and preserving the good functioning of their financial sector. These proposals said nothing about the form these protective measures should take. However, as they were adopted, the new EU regulation could in principle legitimise *national regulatory actions and moral suasion* in support of government debt financing outside the capital market.

With regard to the same EU regulation the European Parliament also suggested to authorise distressed euro area countries to introduce *restrictions on capital movements* vis-à-vis third countries outside the EU if these were to cause serious difficulties for the operation of EMU (in accordance with TFEU Article 66). This should support in particular their fight against tax evasion, on the grounds that this can lead to shortfalls in public revenues that offset the official financial assistance received.

As noted in Section 3.5.1, capital restrictions are in conflict with the efficient functioning of the internal market and their use is therefore strictly conditioned by the EU Treaty. One might argue, as the European Parliament did, that specific measures are necessary on grounds of public security and in order to protect crisis-affected countries and thereby the proper functioning of EMU. Cyprus and Greece indeed introduced capital outflow measures on a temporary basis, also vis-à-vis other Member States (see Section 4.4.1). As stated by TFEU Article 65.3, requisite national measures in the field of taxation or for public security reasons must be proportional and not constitute a capital restriction in disguise. Tax evasion could in this respect be addressed more effectively by improving the tax administration and cooperation with foreign tax authorities. While EU legislators agreed that the countries concerned must take measures to safeguard tax revenues, the suggestion to restrict capital outflows for this purpose was therefore rejected in the negotiations.

5.3.3 Crisis resolution measures

When crisis prevention and crisis management turn out to be unsuccessful, the moment comes when crisis resolution measures are called for. Various (actual and proposed) pieces of European legislation offer help to governments in this regard.

1. *Common rules for sovereign debt restructuring*

a. *Sovereign default protection scheme*

During the negotiations on the new European Union (2013a) regulation on enhanced surveillance of euro area countries facing financial stability risks, the European Parliament (2012b) voted in favour of temporarily placing a euro area country that is at risk of default or suspension of debt payments under legal protection. This would make close-out netting or credit event provisions inoperative, freeze interest rates on loans, give priority to reimbursing new loans over repaying outstanding debt (with the exception of earlier official financial assistance), require creditors to make themselves known and demand from the public authorities concerned to submit a recovery and debt settlement plan. The inspiration for this legal protection scheme may have been taken from Chapter 11 of the US Bankruptcy Code for individuals, corporates and municipalities.

A concern was that the existence of such a statutory insolvency code for euro area countries might create moral hazard among opportunistic governments, which could be attracted by debt-financed public spending and the option to ask for default protection whenever their debt obligations became insurmountable. Legislators also feared that a formal sovereign default protection could scare off investors, knowing that they may not be able to enforce their creditor rights on loans to the sovereign or their insurance claims from credit default swaps whenever the country concerned entered into a credit event. This would seriously hinder market access for governments subject to financial strain. Given the Maastricht Treaty provisions against a sovereign bail-out, the legal feasibility of an insolvency protection regime for sovereigns was also in doubt. Hence, this idea of the European Parliament was rejected in the negotiations and alternatives had to be considered.

b. *Private sector involvement*

As discussed in van Riet (2016), the political choice of euro area leaders in spring 2010 in favour of funding the Greek government's debt instead of writing it off suggested that its emerging insolvency was treated as if it was a temporary liquidity problem and that money from European taxpayers was used to avoid bailing in private investors. This initial response to the Greek crisis was motivated by the fact that at that point in time many European banks were heavily exposed to Greek public and private sector debt. This meant that there were incalculable risks of a sovereign debt restructuring, not just to the Greek economy, but for weakened banks and vulnerable countries throughout EMU and hence for economic and financial stability in the euro area as a whole.

To limit the burden on European taxpayers, all euro area finance ministers had nevertheless informally agreed in May 2010 to urge the banks in their country that were exposed to Greece to join the official sector in making a 'voluntary' contribution to solving the Greek crisis, by holding on to the Greek government bonds in their portfolios for at least the duration of the three-year EU/IMF adjustment programme (see Bastasin, 2015). For example, the German financial industry publicly accepted to broadly maintain its exposure to Greece. Major French and Dutch banks also committed to their

Finance Minister to keep their investments in Greek sovereign bonds over the horizon of the Greek adjustment programme. The national authorities communicated these commitments to the IMF.

Yet, this moral suasion of euro area banks to remain invested in Greek government bonds also kept them vulnerable to a write-down of this debt, notably when the official sector has a preferred creditor status. The risk of becoming subject to private sector involvement in a sovereign debt restructuring and standing at the end of the creditor line can be a strong deterrent for investors to hold on to sovereign bonds, especially those from euro area countries with a weak fiscal position, fragile banks and an uncompetitive economy. French and Dutch banks therefore soon started to offload their Greek government bonds, despite their initial commitment to keep them in their portfolios.

Continued market uncertainty about the sustainability of public debt in Greece and other vulnerable countries turned into a market panic following the Deauville agreement between France and Germany of October 2010. The leaders of these two countries indicated that in future a euro area country in need of official financial assistance was always expected to arrange an adequate participation of private creditors, as one could not expect foreign taxpayers to carry the whole burden. The principle of burden sharing between the private sector and the official sector was laid down in the initial ESM agreement of November 2010. Given the Maastricht Treaty provisions against a sovereign bail-out, in contrast to the EFSF, the ESM was also to be given seniority, i.e. a preferred creditor status (second to the IMF).

The seniority of the official sector and the consequent subordination of private bondholders in a public debt restructuring could complicate a return to the market at reasonable interest rates for stressed euro area sovereigns (Tran, 2013). The larger the official financial assistance given, the larger any debt write-down for subordinated private creditors would have to be in order to restore a sustainable public debt ratio, making it harder to negotiate a voluntary agreement (Brooke et al., 2013). Still, as long as the country only required liquidity support, the availability of official funding subject to strict policy conditions should be expected to improve the fiscal and economic outlook and hence reduce a country's default probability. The concessional interest rate on this official loan implies a subsidy to the beneficiary country which also improves the chances of continued debt service to private creditors. Hence, the view that the preferred creditor status of the official sector always puts private bondholders at a disadvantage needs to be qualified (Ghezzi, 2012; IMF, 2012b).

The consequence of the political agreement of Deauville was nevertheless a rapid rise in market uncertainty. After this burden sharing was endorsed at the euro area level, this new credit risk of an automatic private sector involvement – even though it was foreseen to apply only from 2013 onwards – translated for all debt-ridden countries into capital flight and soaring sovereign bond yields. German banks also broke their earlier promise to the government and sold massive amounts of their Greek government bonds, including their claims on other vulnerable countries.

The final ESM Treaty, as signed in February 2012, then limited the requirement of private sector involvement to exceptional cases of an insolvent country with an unsustainable public debt, in line with established IMF procedures. A recital mentions that the ESM's preferred creditor status will be

similar to that of the IMF (while accepting that the IMF enjoys priority over the ESM) and that it will be limited to ESM assistance in the form of loans.[52] To underscore the exceptional nature of a private sector involvement, euro area finance ministers described the Greek debt restructuring that was implemented for private bondholders in March 2012, in conjunction with a second EU/IMF adjustment programme, as a "unique case". As argued by Roubini (2012), private creditors got a very sweet deal in this particular case, partly financed by the official creditors despite their seniority (see Section 4.4.1). This cautious treatment of the private sector was also evident in the subsequent Greek debt buyback operation in December 2012 and the much less invasive Cypriot debt restructuring of June 2013, which were both explained as a necessary "debt management operation".

To address the moral hazard concerns associated with the availability of official support facilities, both on the part of public debtors and private creditors, Weber et al. (2011), Brooke et al. (2013) and Wendorff and Mahle (2015) propose to come to a more balanced ex ante burden sharing. Governments should in their view issue contingent convertible bonds (so-called 'cocos'), i.e. bonds for which it is stated in the contract that the maturity will be automatically extended by a given number of years when the government has lost market access, is unable to amortise its outstanding debt and has to request for official assistance. This *contractual debt reprofiling* allows the sovereign to transfer its roll-over risk on to the private creditors. These will have an incentive to be even more cautious in lending to governments, since they know in advance that in case of fiscal stress, any forthcoming official support will be used only to finance new debt at an affordable interest rate and not to service the old debt. The presumption of an automatic bail-in of private creditors as laid down in sovereign bond contracts will (initially) be reflected in higher and possibly more volatile bond yields. This implies stronger market pressure on governments to maintain sound public finances.

Rediker and Ubide (2014) caution that such a one-size-fits-all approach would too much limit the discretion with which official lenders can take a country's needs and systemic risks into account. A contractually laid down debt reprofiling hitting domestic creditors in the context of economy-wide balance sheet constraints could cause serious national damages. The prospect of official assistance could then become destabilising rather than confidence building. One perceived benefit of these state-contingent bonds is, however, that it establishes an investor base of both domestic and foreign investors and that the costs of any unexpected bail-in will always be shared between them.

Going beyond a contractual lengthening of the maturity of government bonds, a number of proposals have been put forward to establish a formal *sovereign debt restructuring mechanism* for euro area countries, building on an earlier IMF debate related to advanced economies (see Krueger, 2002). Feld

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[52] Vanden Bosch (2012) argues that private investors may still fear that de facto seniority will also apply to the ESM's interventions in primary and secondary government bond markets. He proposes to lift this ambiguity in the same way as the ECB did for its OMT. He also notes that leveraging this market access support by offering private investors partial risk protection certificates and co-investment funds, if extended from the EFSF to the ESM, would contradict the seniority status of the ESM. Should a beneficiary country default and organise a debt restructuring, the ESM would then have to give priority to compensating private investors for their loss.

et al. (2016) and Fuest et al. (2016) propose to establish a statutory procedure to arrange an orderly sovereign default of euro area countries as an 'ultimum remedium', in connection with granting an ESM loan, once it has been established that a participating country is (nearly) insolvent, i.e. its government debt is unsustainable, it cannot realistically commit more future taxes for debt service payments and it is unlikely to grow out of its debt. Assuming a gradual introduction over time to prevent market disruption, a sovereign insolvency procedure in combination with official assistance could allow for a more timely and efficient process of dealing with a government debt overhang, notably by accomplishing a suspension of debt repayments and organising a debt restructuring at the lowest cost to the economy concerned (see Große Steffen and Schumacher, 2014; Fuest et al., 2016). This could also be advantageous for private creditors by raising the likelihood of continued debt service, albeit on less favourable terms, or a greater chance of receiving at least partial repayment. Moreover, the possibility of a sovereign default inside EMU strengthens the credibility of the temporary and conditional nature of the fiscal backstop of the ESM and the monetary backstop of the ECB. This would remove the implicit subsidy that private investors enjoy when they may count on the official sector to step in with loans and/or market access support for a troubled eurozone country.

The CIEPR (2013) argues in favour of making the conditions attached to official ESM assistance contingent on the degree of fiscal stress. Troubled euro area countries with a debt ratio below the Maastricht Treaty threshold of 60% of GDP could get unconditional ESM support; those with government debt above 60% of GDP would have to subscribe to an adjustment programme; and those whose debt ratio has reached 90% of GDP would have to restructure their debt (and are made immune from legal action by holdout creditors). The latter bail-in of private creditors would protect the limited ESM resources from financing unsustainable debt positions and avoid imposing extreme fiscal adjustments upon a distressed member country.[53] This statutory approach would lead to more differentiated borrowing costs across euro area countries in line with their evolving public debt ratios.

Learning the lessons from its exceptional assistance to Greece, the IMF (2016) applies since 2016 the principle that any exceptional access to its lending facilities (i.e. above normal financing limits) requires public debt of the country concerned to be sustainable with a high probability (= green zone). When that is the case, the IMF is ready to provide financial support without requiring any debt operation. For cases when the probability of a return to sustainable public debt is not high (= grey zone), the IMF may grant the same exceptional access as long as additional financing from other official or private sources is available on terms sufficiently favourable to secure public debt sustainability and to safeguard the IMF resources. When the country has no market access, the IMF will normally ask it to implement a debt reprofiling of existing claims (i.e. an extension of maturities falling due during the support program while keeping the principal and coupon the same) in dialogue with creditors. When government debt is clearly unsustainable (= red zone), i.e. where the scheduled

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[53] Wyplosz (2013) and Corsetti et al. (2015) also propose to use public debt restructuring as a tool for removing the crisis-related legacy of high public debt, notably with the aim to restore euro area countries' room for fiscal policy manoeuvre.

debt service exceeds the capacity of the member country to service it – even when taking into account IMF financial support as well as a strong adjustment program – exceptional access to IMF funds is conditional on a definitive debt restructuring upfront in order to remove the debt overhang and restore public debt sustainability with a high probability. The IMF had introduced a systemic exemption in 2010 for the 'red zone' case of Greece, which exceptionally allowed it to participate in bailing out this country with a view to the systemic risks for financial stability both in the eurozone and beyond; the option of an exemption for systemic reasons was removed in 2016.

To facilitate a potential future public debt restructuring at the expense of private creditors, euro area countries included, as from January 2013, standardised and identical collective action clauses (CACs) in the terms and conditions of all new government bond series. The CACs allow all debt securities issued by a country to be considered together in negotiations and thus facilitate getting a qualified majority of bondholders to accept a debt restructuring offer.[54] In principle, this weakens creditor rights because individual investors have to agree in advance that they will be bound by this qualified majority decision (Tran, 2013).

CACs could also create incentives for opportunistic governments to engage in excessive borrowing. They make public debt more 'malleable' (Buchheit, 2012) and therefore raise the chance that a distressed sovereign might ask for a restructuring of its debt obligations. Aware of this moral hazard, investors in turn might demand a higher risk premium, which could increase the cost of sovereign credit, especially for the more vulnerable euro area countries. At the same time, CACs would allow for a more timely and orderly public debt restructuring and, hence, reduce the costs of dealing with holdout creditors who would refuse any offer to change the terms of payment. This might also be of value for private creditors, who could reward this with a yield discount.

Bardozetti and Dottori (2014) examine the relative weight of these arguments for a large panel of countries at various stages of development (including nine eurozone members who generally did not enter CACs in government bond contracts). Looking at the period from March 2007 to April 2011, they find no evidence that the use of CACs increased sovereign borrowing costs. On the contrary, the market awarded a discount for countries in the middle of the credit rating scale and having a non-negligible probability of default, whereas there was no effect for the best-rated countries given their low probability of default, and neither for low-rated countries since in their case the value offered by CACs is probably offset by the risk of opportunistic behaviour on the part of the sovereign. Bradley and Gulati (2014) also find no empirical evidence that the introduction of CACs increased the cost of credit for governments; in fact, non-investment grade countries with the weakest fiscal positions enjoyed lower bond yields.

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[54] The euro area CACs require at least 66.67% (in value terms) of the holders to agree to a change in the payment terms of an individual outstanding sovereign bond (which compares with a typical minimum threshold of 75%). Moreover, an aggregation clause allows the debtor to apply the modification of the payment terms simultaneously to all outstanding sovereign bonds, provided that at least 75% of the holders across all bond series agree.

The first sovereign bonds issued with CACs by euro area countries since the start of 2013 were absorbed by the market without a noticeable upward impact on yields (Große Steffen and Schumacher, 2014). This suggests that the introduction of CACs so far has been ineffective in countering the moral hazard – both on the part of public debtors and private creditors – created by the permanent fiscal backstops of the ESM. Above all, it may signal to private investors that any future public debt restructurings will continue to be organised in an ad hoc manner instead of through a statutory insolvency regime for sovereigns.

Finally, a concern is that the existence of a formal sovereign debt restructuring mechanism might lead opportunistic over-indebted governments to prefer a default rather than a repayment of their debt obligations – especially when the government bonds are to a large extent held by non-residents and the impact of a debt restructuring would be felt less among domestic creditors. To address this concern, the reinforced EU multilateral surveillance framework against excessive public debt would have to be strictly implemented and rigorously enforced. Opportunistic behaviour on the side of governments may also be contained by stronger market discipline. A more realistic prospect of an orderly sovereign default should be expected to increase the credit risk premium and the cost of public sector borrowing. This should make investors more cautious when placing their money with sovereigns, because in times of duress eurozone countries with an excessive public debt might only receive official sector assistance in combination with a restructuring of debt outstanding with the private sector.

c. European bank recovery and resolution

The extent of private sector involvement was also heavily debated when the European authorities designed a new EU framework for the recovery and resolution of banks. The costs of a bank failure with systemic implications for the financial system and the economy can be very large and drain the government's budget. Moreover, the treasury may have a 'cozy relationship' with important domestic banks as major creditors of the central government and/or of regional and local authorities. Hence, a collapse of systemic credit institutions could create a big hole in the government's budget as well as in the public sector's funding programme. For both reasons the treasury will do its utmost to prevent their demise. This implicit state guarantee implies a sizeable public subsidy that reduces the funding costs of banks. The associated moral hazard may induce credit institutions to increase their leverage and enter into riskier activities – especially those promoted by politicians looking for electoral gains – based on the expectation that profits will remain private while losses will be socialised. Either taxpayers or the bank's stakeholders will ultimately carry the costs of this risk shifting.

In the wake of the global financial crisis, European governments spent substantial amounts of public money on stabilising distressed banks and safeguarding financial stability. Moreover, to prevent a bank run, they decided to raise the level of retail deposit insurance from EUR 20,000 to EUR 100,000. This bail-out confirmed the perception that taxpayers will always foot the full bill when financial institutions get into trouble. Several empirical studies show that the market value of this implicit public subsidy has increased rapidly during 2008-2010 (see IMF, 2014). On the one hand, this may be

a price worth paying to prevent creditors and depositors – fearing a bail-in – from causing a bank run, capital flight, a collapse of the financial system and a deep recession (see Dewatripont, 2014; Avgouleas and Goodhart, 2015). On the other hand, Dübel (2013) considers that a significant potential for private creditor participation in carrying the burden of the bank rescues has been wasted.

When national authorities wish to resolve an insolvent bank without imposing the costs on taxpayers, their interference in the property rights of shareholders, creditors and depositors should follow international standards and follow a pre-defined hierarchy, as agreed at the G20 level (see Financial Stability Board, 2011).[55] Taking these G20 standards into account, the European authorities agreed on a new hierarchy in bank rescue operations, placing a private sector bail-in before any public sector bail-out and making the involvement of a common fiscal backstop a last resort. This new hierarchy should give market participants a stronger incentive to monitor the risk exposure of banks in which they have invested. The priority given to private sector involvement should restore market discipline as it pushes back the moral hazard of banks being able to enjoy the profits of excessive risk-taking while free-riding on society for major losses.

While this EU financial reform enhances market functioning and should have significantly reduced the market value of the implicit public subsidy that (systemic) banks in Europe enjoy, the initial empirical evidence showed only a moderate, insignificant reduction over the period 2011-2013 (IMF, 2014). This may be because the EU resolution regime allowed for discretion on the part of the national authorities to ensure the continuity of vital financial services, safeguard the stability of the financial system and guard against the risk of economic disruption. Subject to the EU's state aid rules, in exceptional circumstances, the national government could take possession of the systemically important functions of a failing bank and use taxpayer funds for temporary capital injections into solvent banks that cannot access sufficient private funds.

Since the political agreement of June 2012 to move towards a European Banking Union with the objective to break the continued nexus between fragile banks and their sovereigns at the national level, EU bank recovery and resolution must be seen in a new context (see Box 5.1).

Box 5.1 – Bank supervision, recovery and resolution in the European Banking Union

Given the risk of further bail-out operations after the financial crisis of 2007-2008, European governments became vulnerable to the health of their banking system. Moreover, banks holding a large amount of sovereign bonds on their balance sheet became dependent on the fiscal space of their government to rescue them in an emergency. Faced with the urgent need to break this vicious nexus between sovereigns and the banks in their jurisdiction, euro area leaders took the historical decision in June 2012 to move towards a European Banking Union, consisting of three pillars, which is also open to non-euro area EU countries to join.

The first pillar is the Single Supervisory Mechanism (SSM), under which the ECB assumed as from November 2014 the new responsibility for supervising all the 128 significant banks in the eurozone (after a comprehensive health-check of their balance sheets) and ultimate intervention powers for the

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[55] In most G20 countries the right to property is protected by law and exceptions are subject to conditions.

about 6000 less significant banks which remain under the surveillance of national supervisors following a new, single rulebook.

Under the second pillar, since January 2015, for countries participating in the European Banking Union, the decisions on whether and how to restructure a significant bank are taken and implemented by a new Single Resolution Authority, upon a proposal from the ECB that a bank is on the brink of failing and based on a resolution scheme adopted by the European Commission. As a matter of principle, when a systemic bank is failing, priority will be given to a bail-in of its shareholders and creditors over a bail-out by the public sector in case of a bank failure.

Until the Single Resolution Authority took over, euro area governments without the necessary fiscal space for unavoidable bank rescue operations could still borrow from the ESM to recapitalise their troubled banks, subject to conditionality focused on restructuring the financial sector. The euro area leaders further agreed in June 2012 that, once an effective single bank supervisor had been established, the ESM could also be used to directly recapitalise weak systemic banks in the euro area, provided that the government has no fiscal capacity to borrow from the ESM for this purpose. This option has the advantage that the government debt of the country concerned no longer increases, as was still the case for Spain when at the turn of the year 2012/13 it received a large ESM loan for bank recapitalisation purposes.

The ESM direct recapitalisation instrument was adopted in December 2014. Using this instrument as an ultimate direct fiscal backstop for systemic banks is subject to preconditions. For a transitional period until 31 December 2015 it was required that at least 8% of a failing bank's total liabilities including own funds had been bailed in. In addition, the Member State's national resolution fund had to make a contribution. Since January 2016 all the burden-sharing arrangements that then become operational must first have proven to be insufficient to return the systemic bank in question to viability. A constraint is that the ESM funds earmarked for direct bank recapitalisation are limited to EUR 60 bn.

As of 1 January 2016 the Single Resolution Authority is able to draw upon a Single Resolution Fund with a targeted level of EUR 55 bn. in which, as result of an intergovernmental agreement, the national resolution funds (that are funded by bank levies over a ten-year period) are progressively mutualised over an eight-year period starting with 40% in the first year and 20% in the second year. The Single Resolution Fund could, if necessary, also borrow in the market to increase its firepower. However, the political agreement to give the Single Resolution Fund access to an ultimate fiscal backstop at the euro area level, for example a temporary ESM credit line (whereby any public sector assistance would be recouped through ex post levies on the financial industry), still has to be implemented.

Finally, a recast EU directive on Deposit Guarantee Schemes of June 2014 provides for the harmonisation of national deposit insurance schemes – fully protecting retail bank deposits up to EUR 100,000 – and ensuring their pre-funding by the banking sector with a targeted level of at least 0.8% of covered deposits (i.e. about EUR 55 bn. for the EU as a whole) to be reached by July 2024. The Commission published in November 2015 a proposal to come to a European Deposit Insurance Scheme that as the third pillar of the European Banking Union should protect retail bank depositors at least across the eurozone. Due to the crisis legacy of weak banks across Europe, the political interest in moving to a single deposit insurance mechanism has so far been limited, also because it would require a fiscal backstop at the euro area level to pre-finance the return of savings to depositors.

The new, much more fiscally conservative European approach towards bank restructuring was evident for the first time in the bail-in measures that were agreed by the Eurogroup on 25 March 2013 to deal with the two largest Cypriot banks in distress (following the big haircut on their holdings of Greek sovereign debt a year earlier). For the first time, also uninsured depositors were hit: with the notable exception of public sector deposit holders, savers lost all their deposits above EUR 100,000 (the maximum under EU retail deposit insurance) held at the bank to be resolved (Cyprus Popular Bank or

Laiki Bank), or their uninsured deposits were used to recapitalise the bank to be rescued (Bank of Cyprus) through a conversion into equity after a haircut of 52.5%. As explained by the president of the Eurogroup, this specific solution was tailor-made to the exceptional situation of Cyprus where the capital needs of a very large banking sector exceeded the fiscal capacity of the sovereign. The political preference for adopting this solution as a template for future cases was nevertheless evident.

The initial plan agreed in the Eurogroup on 16 March 2013, but rejected by the Cypriot parliament, was to impose an upfront one-off stability levy of 6.75% on all bank deposits up to EUR 100,000 and of 9.9% on all deposits above this level. The failed attempt to confiscate a part of <u>insured</u> deposits held across all Cypriot banks irrespective of their capitalisation was justified as an exceptional contribution. This was considered to be acceptable given the relatively high deposit interest rates in Cyprus, the absence of a wealth tax and the large number of rich deposit holders from abroad. However, the subsequent public outcry soon made clear that contravening EU law by throwing retail deposit insurance out of the window could trigger a 'bank run' in Cyprus, with contagion of other euro area countries with a large banking sector and weak public finances. As a result, Cyprus had to introduce a bank holiday and temporary capital outflow controls (see Section 4.4.1).

Against this background, the European Commission (2013d) updated the common conditions under which Member States are authorised to give temporary state aid to ailing financial institutions (the so-called Banking Communication). From August 2013 up to December 2015 failed banks were required to work out a restructuring plan that offers the prospect of a return to profitability. The shareholders of the bank, its subordinated creditors and the bank itself were expected to contribute as a first resort to recapitalisation before public funding and asset protection could be requested (while senior creditors and depositors still remained exempted from burden-sharing). Early public sector support could only be offered when there were overriding financial stability concerns that required an urgent intervention or when the sum involved was relatively small.

The subsequent EU Bank Recovery and Resolution Directive or BRRD (European Union, 2014b) became effective in January 2016 and seeks to ensure that systemic bank failures across Europe are dealt with in an orderly fashion that safeguards financial stability and minimises the costs for taxpayers. This directive provides the competent national authorities with common powers and instruments to pre-empt banking crises, intervene early in troubled banks and liquidate them orderly in the event of their failure. The provisions for restructuring distressed banks make it mandatory for the national resolution authorities to first write down the claims of shareholders and then convert the claims of creditors and, if needed, eligible bank deposits into equity, for a minimum amount of 8% of total liabilities, before granting access to the national bank resolution fund (that must be built up over 10 years by bank levies). Among some other secured liabilities, retail deposits covered by deposit guarantees are excluded from such bail-in operations.

After the BRRD had entered into force, the principle that systemic banks would be resolved by bailing-in its private creditors rather than with the help of a public sector bail-out proved difficult to

uphold in a few cases. The main stumbling block was the fate of retail savers who had been led to believe that buying bank debt was a secure investment. Most bank failures since 2015 were addressed while leaving senior bond holders and depositors untouched and compensating retail owners of junior bonds. Following the rules as laid down in the BRRD, in June 2017, the Italian government financed a precautionary recapitalisation of Monte dei Paschi di Siena, after a failed attempt to organise a private sector capital injection for this systemic bank. On this occasion, the existing shareholders and junior creditors had to accept major losses. Shortly after, the relatively small Veneto Banca and Banca Popolare di Vicenza were dealt with under national insolvency procedures and the Italian government gave substantial subsidies and guarantees to the commercial bank willing to take over what was left of their performing assets. As before, the additional fiscal costs and risks could be an incentive for taking measures of financial repression that relieve the country's budget constraint.

5.4   A composite index of government funding privileges in EU prudential law

This section proposes a new index of government funding privileges based on ten selected pieces of EU prudential legislation introduced over the period 2008-2017, or still pending, as discussed in Section 5.3. A government funding privilege is in this context defined as a preferential regulatory treatment of public sector financial instruments versus those issued by the private sector. The focus is on scoring the main cases of preferential capital market access for governments that can be found in these EU financial laws, as documented in detail in the annex to this section.

The resulting index of government funding privileges is presented both in terms of their *de jure* application as specified in the respective EU legislations and their *de facto* capital market relevance from the moment that the legislative proposals were published. Moreover, the charts show the relative contributions to the overall change of the index of the three main categories of prudential legislation, namely 'banking' (covering credit institutions and money market funds), 'investment' (comprising collective investment funds and institutional investors) and 'markets' (for market infrastructure, credit rating agencies, short-selling and CDS contracts, and the financial transactions tax). The analysis of changes in the index over the period 2008-2020 supports the overall assessment in Section 5.5 as well as the empirical analysis of government borrowing costs in Chapter 7.

5.4.1   *European financial reforms: de jure application and de facto anticipation*

Most adjustments or additions to the EU legislative framework in the area of finance take considerable time to be completed. The European Commission has the right to take legal initiatives. Often, it first issues a communication with ideas and suggestions to sound out the views of stakeholders. This is normally followed by a concrete legal proposal, on which the official opinions of expert institutions (like the European Supervisory Authorities and the European Central Bank) are invited. The EU Council of Ministers (representing the Member States of the EU) and in many cases the European Parliament are the two legislating bodies and both prepare their own legal positions on the proposed law. The three views of the European Commission, EU Council and European Parliament are

subsequently discussed in a 'trialogue' to come to a common position, taking account of the official expert opinions. Once a full agreement on the text has been reached, in the form of a compromise, the new legislation is published in the *Official Journal of the European Union*, after which it enters into force.

EU regulations are immediately enforceable in the Member States, while EU directives oblige the national authorities to transpose them in their domestic legislation within a certain period, albeit with some discretion in terms of the exact national transposition date in case of technical constraints.[56] This study ignores the difference between EU regulations and EU directives in terms of the respective dates of enforceability and transposition at the national level, because the focus is on developments at the European supranational level. EU legislation anyhow often grants a transition or phasing-in period before the new rules apply, so as to give the EU and national regulators concerned, as well as the targeted financial industry, time to prepare themselves.

This brief description shows that new EU financial legislation may already affect the behaviour of market actors as soon as the first, clearly specified proposals are on the table – at least, if these stakeholders consider that the Commission's legal proposals are of material importance to them and have a reasonable chance of being adopted by the legislators (even though lobbying activity might still change them). As observed by the studies reported in Section 5.3, in several instances the announcement of forthcoming European legal changes pertaining to financial markets and institutions indeed had a notable impact on financial variables. This suggests that it is important to distinguish the *de jure* application of new legislation from its *de facto* anticipation effect on market participants, which is deemed to start as soon as the Commission has published its legal proposal (ignoring the fact that the Commission often first issues one or more communications with initial ideas, concrete suggestions, or a consultation to invite the views of stakeholders).

Against this background, this section proposes two variants for constructing a composite index of government financial privileges: one based on the de jure application dates of the EU prudential legislation and the other based on the publication dates of the initial EU legal proposals when they de facto become relevant for forward-looking actors in sovereign bond markets. The former 'de jure index' aggregates the changes in sovereign financial privileges that have been adopted since 2008 according to the dates when they became official (some aspects of which only apply in the coming years, up to 2020). The latter 'de facto index' captures in addition all anticipated quasi-fiscal elements in the new EU financial laws (which includes those in force where technical implementation standards are still to be laid down, those that are still in the legislative process, and those that were deferred), which should be most relevant for the reaction of investors in government bond markets.

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[56] As shown by Kalemli-Ozcan et al. (2010), the transposition dates of the 27 EU directives related to the Financial Services Action Plan (launched in 1998 to achieve legal harmonisation in financial services and promote financial integration) differed considerably across the Member States and in some cases went beyond the common deadline.

5.4.2 Financial repression indices in the literature

To construct a summary measure of individual financial policy interventions with different dimensions and to show their evolution over time, the academic literature suggests building a composite regulatory index of financial repression that groups them together. A number of options are available.

A frequently used method is to construct dummy variables that take the value 0 when a specific financial policy is not in force and the value 1 when it is in effect. This gives a matrix of 0-1 dummy variables for each policy measure that a country has introduced over time. To further reduce the complexity of the matrix, some studies derive the principal components which summarise the joint influence of all the financial policies considered. This calculation method has been used, for example, by Demetriades and Luintel (1997) and Bandiera et al. (2000) to build a financial repression index, or when inverted, a financial liberalisation index.

Williamson and Mahar (1998) produce a simple index that focuses on the evolution of the average level of prudential regulation and supervision for each of the countries included in their review. The more complete the set of prudential rules at each point in time, the higher the score that they assign. Their index ranges from 1 (almost no prudential standards for banks) to 5 (a full set of prudential standards is in place), with intermediate scores reflecting that the relevant laws are not fully enforceable or the regulatory programme has still to be fully implemented.

Kaminsky and Schmukler (2008) construct a chronology of financial liberalisation in emerging and mature economies over the period 1973 and 2005. For each country they capture the liberalisation of the capital account, the domestic financial sector and the stock market in an index by studying the evolution of the relevant regulations. Following a set of criteria each of these three sectors is classified over time as: fully liberalised (with an index equal to 1); partially liberalised (index equal to 2); or repressed (index equal to 3). The sectoral, country and regional indices account for changes in the intensity of financial liberalisation and for reversals.

An alternative method, used by Beim and Calomiris (2001), is to map each financial policy measure associated with financial repression (which retards financial development) onto a scale of 0 to 100 and to produce an index over time that is approximately normally distributed, with a mean of 50 and a standard deviation of 20. Repeating this procedure and averaging the resulting indices for each of the interventions gives an aggregate index of the degree of financial repression per country.

Abiad et al. (2010) build a financial liberalisation index that captures the multi-faceted nature of the financial reform process in 91 countries over the period 1973-2005. They examine the main regulatory dimensions of the financial system of each country (covering credit controls, reserve requirements, interest rate controls, bank entry barriers, nature of banking regulation and supervision, ownership structure of banks, securities markets regulation, financial account restrictions) and assign for every year a score to each of their sub-dimensions. Combining the sub-scores using equal weights gives a raw score for each of the main dimensions that then is normalised to a 0 to 3 scale. Aggregating them

results in a summary index, with a low value indicating a repressed financial system and a high value a liberalised financial system, showing for each country the progress with financial reforms. Given the similarity with EU financial reforms, this thesis adopts the same approach as Abiad et al. (2010).

5.4.3 *Construction of the European index of government funding privileges*

This sub-section discusses the methodology for constructing a composite index of government funding privileges in major EU financial laws proposed, introduced, or forthcoming in 2008-2020, describing in particular the scoring, aggregation and normalisation methods used (see Table 5.5 for the 10 main reforms of EU prudential law during 2008-2017 selected for this index; Table A in the annex to this section for a detailed overview; and Table B in the annex for the scoring choices).

Construction of the index of de jure government funding privileges

This part describes the construction of the proposed index of de jure government funding privileges, summarising how key reforms in European financial legislation from 2008-2017 further extended the existing EU preferential treatment of governments in capital markets. The index focuses on the dates when the respective EU laws entered into force and specific government privileges took effect (see Table 5.5, column: de jure date of application). As indicated in Section 5.3, in a few cases the new legislation also entails elements which mitigate or even offset a preferential treatment of sovereigns.

Table 5.5 – Selection of main European financial reforms 2008-2017

Main reforms of EU financial legislation	Announced de facto	Applies de jure	Status of legislation
1. EU banking regulation/directive (CRR/CRD IV)	July 2011	Jan 2014	In force, phased in
EBA capital exercise	Oct 2011	Oct 2011	Ad hoc measure, repealed in Dec 2014
2. EU banking structure regulation (proposal)	Jan 2014	?	Under discussion
3. EU investment funds directive (UCITS IV)	July 2008	July 2011	In force
4. EU regulation on money market funds (MMF)	Sept 2013	July 2018, Jan 2019	In force
5. EU insurance and reinsurance directive (Solvency II)	Mar 2008	Jan 2016	In force
6. EU directive for occupational pension funds (IORP II)	July 2010	-	Deferred in May 2013
7. EU market infrastructure regulation (EMIR)	Sept 2010	Aug 2012	In force
8. EU regulation on credit rating agencies	July 2011	June 2013	In force
9. EU regulation on short-selling and CDS contracts	Sept 2010	Nov 2012	In force
10. Common financial transactions tax (FTT) (proposal)	Feb 2013	?	Under discussion

Source: Main changes in EU financial legislation 2008-2017 as described in Section 5.3; cut-off date: 30.06.2017.

Following the approach of Abiad et al. (2010), a composite index is constructed by scoring for each year from 2008 to 2020 the de jure government funding privileges entailed in the 10 selected EU financial laws. The annual score for a specific preferential treatment can range from 0 (no new privilege introduced) to 10 (maximum value for a new privilege introduced). A positive score is assigned to the relevant privilege as from the date when it takes effect by law (which may be subject to a phasing-in period, as specified in the legislation). Similarly, a negative score ranging from -10 to 0 is given for a mitigating or offsetting factor related to this privilege in order to capture the net effect. Because the time scale is annual, a government funding privilege in a law that, for example, is introduced mid-year is accordingly given half the normal score for a whole year.

The individual scoring choices are described in detail in the annex to this section (see Table B at the end of the annex for an overview of these scores). They reflect the estimated scope of financial privileges granted to (or taken away from) investors in government bonds. The maximum score of 10 is given in case of a clear and important preferential treatment of the public sector, while less clear-cut and smaller funding privileges receive a lower score. These choices are by nature judgemental, which unavoidably adds an element of subjectivity.[57]

The annual scores are generally built up from sub-scores using equal weights in case various financial favours for the government appear in the same piece of legislation. The scores for each of the 10 European financial laws under consideration are then aggregated, again using equal weights, into the three main components of the financial system, namely 'banking' (items 1, 2 and 4 in Table 5.5), 'investment' (items 3, 5 and 6) and 'markets' (items 8, 9 and 10). The three group scores are subsequently aggregated applying variable weights into an overall score covering all the government funding privileges on a net basis.

These variable weights reflect the relative shares of 'banking' and 'investment' institutions in funding euro area governments on aggregate. These two groups are each assumed to represent also indirectly half of the government debt owned by euro area households and non-financial corporations. The regulations for the banking sector (covering credit institutions and money market funds) thus affect about 45% of general government gross debt, whereas the laws governing the investment sector (represented by other financial institutions including pension funds and insurance corporations) influence some 30%. The capital market regulations are assumed to account for the remaining share of government debt of about 25%. Since the mid-1990s, the weight of banks has slightly declined and that of investors and markets gradually risen. The variable weights are corrected for the share of euro area government debt held by national central banks and from 2010 also for the holdings of the ECB and official lenders like ESM and IMF.

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[57] Eijffinger and Geraats (2006) constructed an index of central bank transparency and cross-checked their scores for a particular central bank by requesting a senior official of that central bank to review the results that they had obtained.

The overall score across these three groups for the applicable government funding privileges in each year is then normalised to the range 0 to 1 by dividing it by the maximum possible score calculated over all the 10 laws under consideration. This procedure gives a time series for the composite index of government funding privileges, as they apply de jure, for the period 2008 to 2020. Moreover, it allows determining the relative contributions to the overall index from the scores for each of the three sub-categories 'banking', 'investment' and 'markets'.

Note that the normalised composite index only captures the starting level of the government funding privileges found in the 10 selected EU laws and the changes in them that occurred in the wake of the financial crisis; there are obviously a number of additional financial advantages for governments in EU laws not covered by this study (see also Kersting, 2012). Another caveat is that sovereign funding privileges laid down in national legislation (such as investment rules for pension funds) are left out of the analysis since the focus in this chapter is on financial laws at the European level.

Construction of the index of de facto government funding privileges

An index of de jure government funding privileges in EU financial legislation can be usefully complemented by a de facto index that focuses on the dates when initial legal proposals were published or announced by the European Commission reflecting its right of initiative. After a legal proposal for financial policy measures at the EU level has been initiated, it often takes considerable time before the legislators reach an agreement on the envisaged changes and even longer when they finally take effect. As might be expected, the legislative process sometimes leads to substantial amendments of the draft legislation. Moreover, specific technical standards may have to be debated and issued after the law has entered into force.

To account for this 'deliberation period', the de facto index focuses on the dates when the EU financial laws under review, or their amendments, were initiated by the Commission (see Table 5.5, column: de facto date of announcement). Hence, the index of de facto government funding privileges captures the effective start of the legislative process and any relevant changes until they enter into force. This is relevant for the timing of their market impact, as knowledge of forthcoming legislative changes may lead the affected market operators to anticipate their introduction and adjust their behaviour accordingly. The de facto index also covers any announced legislative provisions that counteract the government privileges. For example, in the case of EU prudential banking legislation, the score also accounts for the official EBA recommendation that had the effect of temporarily offsetting the de jure preferential zero-risk treatment of bank claims on the government in the required capital buffer.

The annual score assigned to a forthcoming government funding privilege again can run from 0 (no new privilege announced) to 10 (maximum value for a new privilege announced). A positive anticipation score is phased in from the date when it was proposed and/or published in sufficient detail to be known to stakeholders. Similarly, a negative score ranging from -10 to 0 is given for a mitigating or offsetting factor related to this privilege in order to capture the net effect. As from the date when the financial reform takes effect by law, the given score is the same as that for the de jure index discussed

above. The scoring choices made in constructing the de facto index are made transparent in the annex, where Table B gives an overview of these scores; they reflect the relative importance of financial favours granted to (or taken away from) investors in government bonds.

The overall scoring, aggregation and normalisation methods are the same as for the de jure index. The resulting time series for the composite index of de facto government funding privileges therefore comprises the scores for announced legislative changes during the 'deliberation period' as well as those for the legal application period, again shown for the period from 2008 to 2020. The relative contributions of the three main sub-groups of EU prudential legislation ('banking', 'investment' and 'markets') are also calculated. For empirical studies that seek to relate government market access privileges to financial variables the proposed de facto index would appear the most relevant one.[58]

5.4.4 The rising trend of government funding privileges in EU prudential law since 2008

Figure 5.1 shows the two variants of the composite index of government financial privileges in terms of their de jure application by law and their de facto capital market relevance. This sub-section first focuses on the de jure index of privileges from the time they took legal effect. The second part of this sub-section discusses the de facto index of sovereign privileges, covering both their anticipation based on draft EU legislation and the period when they entered into force.

Figure 5.1 – Government funding privileges in EU prudential law: de jure and de facto

(de jure and de facto indices for 2008-2020, respectively covering scores for all privileges in force, and scores for all anticipated privileges as well as those in force)

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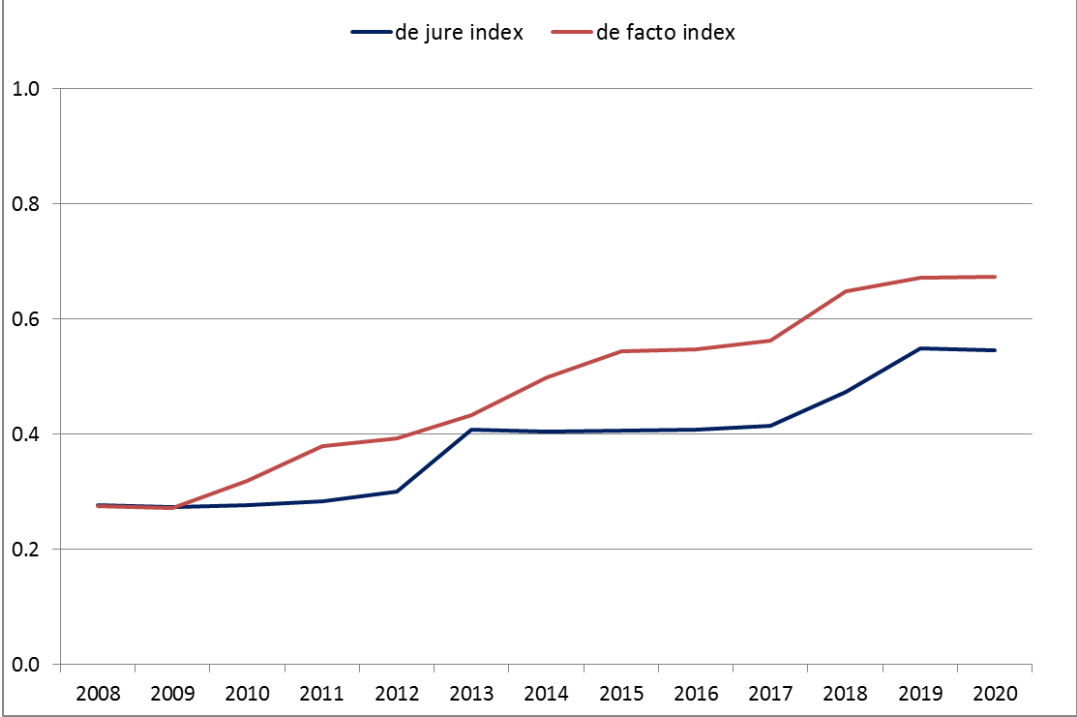
[58] Note that simply using the lagged value of the de jure index in empirical analyses would exclude the anticipated impact of announced EU pieces of legislation that are still under discussion or that have been deferred.

Government financial privileges de jure: only covering laws in force

The starting level of the index of de jure government funding privileges in 2008 (Figure 5.1, blue line), based on the preferential treatment of sovereign exposures in the prevailing EU prudential legislation applicable to credit institutions and investment firms, investment funds, insurance undertakings and occupational pension funds (see Section 5.3.1), was already quite high and provided euro area countries a considerable protection from capital market pressure. After the global financial crisis Europe revamped its financial legislation while taking care that also in these revised or new laws Member States would continue to be protected from market discipline for prudential reasons.

The updated investment funds directive (UCITS IV), effective from mid-2011, simply extends the existing government funding privileges and do not lead to a rise in the de jure index. By contrast, the new EU market infrastructure regulation (EMIR) leads to a significant increase in the de jure index of sovereign privileges as from 2013. From that moment on, also the restrictions placed on credit rating agencies as well as the constraints on short-selling and the ban on naked sovereign CDS contracts carry full weight. The de jure index of regulatory favours for sovereigns is further affected over time by the overhaul of EU banking legislation (CRR/CRD IV) which took effect from 2014 and is gradually being phased in until 2019. The government benefits associated with the new liquidity coverage ratio start to show up in late 2015. The impact of the preferential treatment of sovereigns in the net stable funding ratio is modest, because so far banks only needed to report and monitor this ratio as from 2014. The preferential treatment of sovereigns in Solvency I is replaced by that in Solvency II as from 2016, where it can be found in particular in the provisions for specific market risks. The funding privileges in the EU regulation for money market funds kick in only as from 2018. The EU banking structure regulation and the common financial transactions tax are (at the time of writing) still under debate: the scores for their government funding privileges are of course 0 in the de jure index.

At the same time, there are offsetting factors which explain that between 2013 and 2017 the de jure preferential regulatory treatment of sovereigns is broadly unchanged. As from 2014, banks had to report their leverage ratio (which treats all assets equally) and although it is not yet binding it had to be disclosed as from 2015. In addition, banks are required to be prudent with their concentration risks. Furthermore, all money market funds have to assess and manage their liquidity and redemption risks. Moreover, the own risk and solvency assessment that insurance corporations have to undertake since 2016 has a moderating impact. Also the gradual phasing out after 2017 of the preferential treatment of government bonds issued by euro area countries in the domestic currency of another, non-euro area EU country, modestly reduces the scope of the regulatory privileges in both banking and insurance.

On balance, the de jure index reaches in 2020 about twice the level (0.55) it had in 2008 (0.28). The sovereign funding privileges related to 'banks' and 'markets' explain all of the overall rise in quasi-fiscal regulatory favours over time (see Figure 5.2, blue and green bars). The additional net funding advantages for governments offered by the revised EU legislations affecting the group of financial institutions included under 'investors' remains overall stable (Figure 5.2, red bars).

Figure 5.2 – Government de jure funding privileges in EU prudential law: contributions

(de jure index 2008-2020 covering scores for all privileges in force; contributions from banking, investment, and markets legislation)
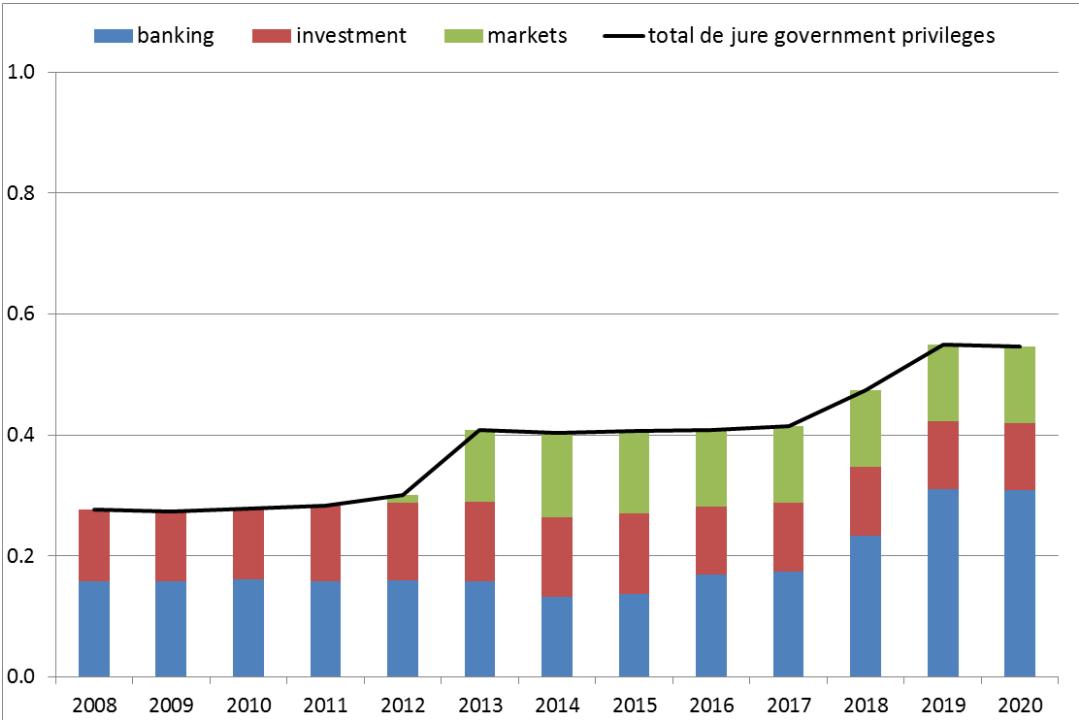
Government financial privileges de facto: also covering anticipation of forthcoming laws

The legislative process of the 10 selected EU prudential laws took considerable time and, as mentioned, is not yet concluded in two cases. This 'deliberation effect' is captured in the index of de facto government funding privileges, which logically shows an earlier increase than the de jure index and (temporarily) reaches a higher level (Figure 5.1, red line).

The early increase in the de facto index is due to Solvency II starting to throw in its weight in terms of the new expected sovereign privilege gradually as from 2008 until it reaches its full score in 2016, while that entailed in Solvency I is assumed to gradually carry less weight over the same period until it disappears from the stage in 2016. The discussion during 2010-2013 on the introduction of solvency rules for occupational pension funds – with a similar favourable capital treatment of sovereign bonds as in the case of insurers – only temporarily raises the de facto index of funding privileges, since this reform was subsequently deferred. In addition, the anticipated quasi-fiscal advantages from EMIR and the restrictions for credit rating agencies, short-selling and sovereign CDS contracts already come into play in 2010-2011. The additional sovereign funding privilege in the revamped EU banking law (CRR/CRD IV) reflected in the liquidity coverage ratio affects market expectations as from mid-2011. The anticipated government privilege related to the net stable funding ratio, which should become binding for banks at some point in the future, raises the de facto index as from 2014. The expectation of government funding advantages in the EU regulation for money market funds shows up in the de facto index as soon as autumn 2013. Anticipation effects regarding the sovereign funding privileges

included in the pending EU banking structure regulation further add to the de facto index as from 2014. The possible introduction of a common financial transactions tax with an exemption for trading in bonds, which was expected to enter into effect as from 2016 but then was postponed, enters the de facto index of fiscal favours in finance already as from 2013.

These expected additional sovereign privileges forthcoming as from 2008 are partially offset by the anticipated mitigating factors mentioned above, notably the future obligation for banks to meet a leverage ratio of 3%, the need for banks to show a prudent behaviour towards concentration risks and the risk assessment that money market funds are required to undertake. The path of the facto index during 2012-2013 also reflects that the preferential regulatory treatment of sovereign claims in the capital requirement for banks was limited considerably due to the EBA's capital exercise that asked them to hold an exceptional buffer against sovereign risk. Furthermore, as from 2015 account is taken of the expected phasing out of the preferential treatment of government bonds issued by euro area countries in the domestic currency of another, non-euro area EU country, both in banking and insurance law. Moreover, the own risk and solvency assessment that is foreseen for insurance companies increasingly dampens the rise in the de facto index over the whole period 2008-2020.

Figure 5.3 – Government de facto funding privileges in EU prudential law: contributions
(de facto index 2008-2020 covering scores for all anticipated privileges and those in force; contributions from banking, investment, and markets legislation)
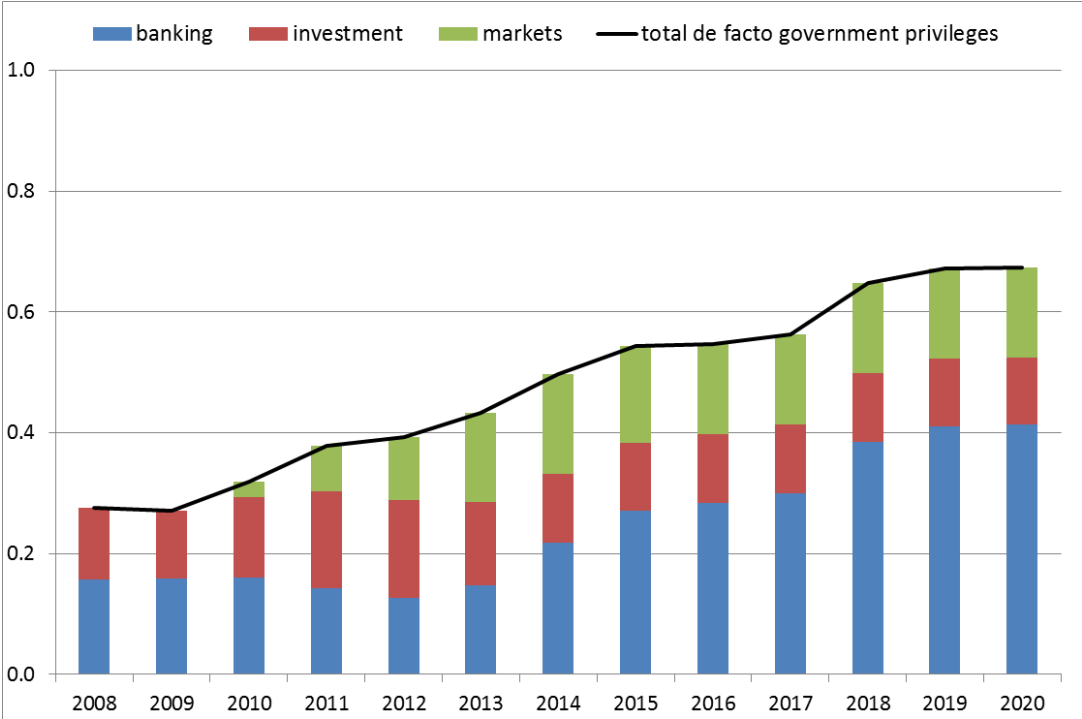
The complete range of preferential treatments of sovereign debt in the 10 cases of EU prudential legislation considered in this section is set to reach its maximum anticipated effect in 2020, with the de facto index then standing at a much higher level (0.67) than in 2008 (0.28). Final political agreements

on the net stable funding ratio and the leverage ratio for banks as well as on the two pending laws (the EU banking structure regulation and the common financial transactions tax) would lead the de jure index to catch up with its de facto counterpart.

Figure 5.3 shows the contributions to the rising de facto index, covering both the expected and actual government funding advantages in the 10 EU prudential laws under consideration. The government privileges found in all the 'banking' laws account for most of the anticipated increase over time (see Figure 5.3, blue bars). Laws affecting the group of other financial 'investors' on balance do not support a growing preferential treatment of governments, given the aforementioned mitigating own risk and solvency assessment in Solvency II (Figure 5.3, red bars). EU legislation focused on financial 'markets' is a new structural element promoting easier market access for sovereigns, with a significant influence as reflected in its contribution (Figure 5.3, green bars). Since at least two of the three EU financial market laws (items 8 and 9 in Table 5.5) (also) seek to deter speculative market behaviour, these regulatory privileges appear more relevant during fiscal stress than in quiet times.

Annex – The scoring of government funding privileges

The purpose of this annex is to provide details on the scores assigned to the various government funding privileges in the 10 EU financial laws selected for the index (as listed in Table A) and their time profile. The scores unavoidably entail some subjective elements and an effort is made to make these choices transparent. Table B offers a broad overview of the end-scores for both the de facto and de jure variants of the index of government funding privileges. The scores are given from a euro area perspective and the final column of Table B shows the end-results without the phasing in or out process that is described below.

1. The previous *EU banking directives* (based on Basel I and II) already contained a preferential zero-risk capital treatment of claims issued and funded in the domestic currency of EU governments. For euro area banks holding claims vis-à-vis their own government this regulatory advantage became the same for claims against other euro area governments, as the exchange rate risk disappeared in 1999. These two regulatory favours are therefore accounted for with a score of 10 in the case of government debt issued by all euro area governments. As claims on non-euro area EU governments issued and funded in their domestic currency (or another EU currency) involve exchange rate risk, the government funding privilege score for these particular claims has been determined at 5, i.e. half the maximum possible score. The exemption of sovereign bonds from the large exposure limit is treated separately and leads to a score of 10.

The European Banking Authority (EBA) called for a temporary capital buffer against sovereign risk, outside the existing EU banking legislation. The relevant recommendation was announced in October 2011, issued in December 2011 and subsequently renewed until it was repealed in December 2014. During this period, the EBA's capital exercise is assumed to have effectively neutralised the regulatory zero-risk capital requirement for the sovereign exposures of banks in the de facto index.

As part of Basel III, in December 2010, the Basel Committee on Banking Supervision (BCBS) published details of the stronger capital adequacy standards and the new liquidity coverage ratio and started work on the new net stable funding requirement and the new leverage ratio, while maintaining the large exposures regime. The corresponding proposals of the European Commission for a regulation and a directive (CRR/CRD IV) came out in July 2011 and entered into force in July 2013. The implementation of Basel III in the EU is being phased in from 2014 over a five-year period. Taking a euro area perspective this affects the range of government funding privileges as follows:

- Between 2017 and 2020 the zero-risk capital treatment of sovereign bonds that are issued and funded in the currency of another (non-euro area) Member State than that of the issuing EU government will be phased out. Over this period, the corresponding de jure score for this government privilege declines from 5 to 0; a small anticipation effect for 2015-2017 has been added to the de facto index.

- Although (at the time of writing) the European authorities still have to formally adopt the applicable rule, the European Commission (2016) has proposed to set the minimum leverage ratio at 3%, which for those banks where it is binding reduces the incentive to buy government bonds because it applies to the ratio of regulatory capital relative to total assets irrespective of their risk-weighting. The step-wise introduction since 2014 first entails a qualitative implementation by national supervisors, which justifies a modest score of -2 for this countervailing element in the de jure index. As for most banks the minimum leverage ratio appears unlikely to be binding in practice, the same score of -2 is assigned in de facto index, after an anticipation period.

- From October 2015 to January 2018 the liquidity coverage ratio is being phased in, which favours zero-risk government securities as 'high-quality and liquid' assets. Moreover, these sovereign instruments are carved out from the diversification requirement for the same category of assets. Both financial advantages attract a full-year score in the de jure index of 6 in 2015 which then rises to 10 in 2018. Given anticipation effects, the de facto index starts already with a whole-year score of 5 from mid-2011 until 2014, after which it rises further to follow the transition path of the de jure index to a score of 10 in 2018.

- The exact definition of the net stable funding ratio was only decided by the Basel Committee on Banking Supervision (BCBS) in October 2014. The net stable funding requirement contains a similar preferential treatment of government securities as the liquidity coverage ratio. The European legislators (at the time of writing) still have to formally adopt the corresponding European Commission (2016) proposal to not ask any stable funds to be held against claims on or guaranteed by sovereigns (in contrast to the 5% put forward by the Basel Committee). Since the observation period for the net stable funding ratio has already started in 2014, this new privilege so far enters the de jure index with a score of 2. To account for an anticipation effect, this financial advantage for governments is de facto phased in with a score of 2 in 2014 which then rises each year to 10 in 2020.

- Under the large exposures regime, credit institutions do not face a maximum on their sovereign bond holdings, which justifies a score of 10 in both the de jure index and the de facto index. As prudent internal bank controls must be in place to address all concentration risks, a counter score of -2 is added, respectively, from 2011 in the de facto index and from 2014 in the de jure index.

2. The Commission's proposal of January 2014 for an *EU banking structure regulation* also specified an exemption of government securities from the ban on proprietary trading as well as from the separation of high-risk trading. These government privileges would take legal effect in January 2017 and July 2018, respectively. As the legislative process is still ongoing, they are so far excluded from the de jure index. However, they are covered in the de facto index with a whole-year anticipation score of 5 from early 2014 which then rises to 10 as from 2018 in order to account for the delay.

3. The *EU investment funds directive* – the first version of which (UCITS I) dates from December 1985 and had to be implemented at the national level by October 1989 – offers scope for national regulators to allow under conditions a much higher public sector exposure limit than for single private sector entities. This government funding privilege was maintained in the fourth version of this directive (UCITS IV) and is reflected in a score of 9 for both the de facto and de jure variants of the index. UCITS III added from February 2002 (applicable within two years at the national level) the possibility of a higher-than-standard exposure limit for covered bonds issued by a credit institution. This addition reduced in a comparative sense the original privilege for government exposures and gets a score of -2 in the de jure index, while allowing for some anticipation effects in the de facto index. National regulators may also waive the concentration limit for public sector bodies, an option which justifies a de facto and de jure score of 9 for this sovereign privilege.

4. The *EU regulation on money market funds* came into force in July 2017 and applies after one year for new funds and as of January 2019 for existing funds. The creation of public debt CNAV funds while excluding private debt receives a de jure score of 10. Half of this privilege is assumed to have been anticipated already since the European Commission proposal of September 2013, even though it was somewhat different.

Money market instruments issued by government entities enjoy an exemption regarding the prudential requirement for eligible investment assets as well as the concentration limit. These two financial favours for sovereigns are each covered (with equal weights) in the de facto index with a full-year anticipation score of 5 as from the autumn of 2013, which then rises to 10 in 2018. Their scores of 10 enter the de jure index from July 2018 and January 2019, respectively. Regarding diversification requirements, national regulators may under conditions accept a much higher public sector exposure limit and also a higher limit for secure bonds from credit institutions than is the rule for private sector exposures. These allowances translate into the same de jure scores of 9 and -2, respectively, as in the UCITS directive; their introduction is foreshadowed by the de facto index as from autumn 2013.

Since each money market fund has to undertake a mandatory assessment of liquidity risk for all assets under management, an offsetting de jure score of -5 has been added as from July 2018. This de facto

weakening of the sovereign privileges is assumed to be anticipated as from autumn 2013 and gradually included in the de facto index, up to the score of -5 in 2018.

5. Under the *EU insurance and reinsurance directive* Solvency I, which applied from January 2004, government national regulators could exempt government securities from asset diversification requirements, justifying an average score of 9 in the de jure index for claims on EU countries. Although Solvency II entered into force in end-2009, it finally took effect only in January 2016 (the official start date was postponed twice). Given the expected changeover, it is assumed that the sovereign privilege entailed in Solvency I gradually carries less weight over this period and, hence, is phased out in the de facto index.

The European Commission announced its proposals for Solvency II already in July 2007, but only a quantitative impact study of March 2008 specified details on how the various risks would be treated. This study indicated that specific market risks, namely credit spread risk and concentration risk, for EU sovereign exposures would receive similar preferential treatment as in EU banking legislation. This government privilege is therefore included with a gradually increasing anticipation effect as from the time of the impact study; it reaches a score of 10 in de facto index for claims issued and funded in the domestic currency (i.e. the euro) as from January 2016, the official start date of Solvency II, when the score of 10 also appears in the de jure index. For non-euro area EU governments bonds the score in the de jure index is 5, the same as discussed in the case of banks, given the inherent exchange rate risk. As Solvency II indicates, this funding privilege is phased out de jure between 2018-2020 to a score of 0 for government bonds that are issued and funded in any other currency than that of the issuing EU country; a small anticipation effect for 2015-2017 has been added to the de facto index.

The fact that each insurance firm must also conduct a proper own risk and solvency assessment, also with regard to EU government bonds which are exempted from accounting for credit spread risk and concentration risk, is acknowledged with a score of -5 (de facto phased in from end-2009, i.e. the date when Solvency II entered into force; de jure from January 2016, i.e. the date of legal application).

6. The *EU directive for occupational pension funds* (IORP I) already included the option for supervisors to exempt government securities from the asset diversification requirement, which is given an average score of 9, the same as that in the case of Solvency I for insurance undertakings. The plan for a new directive (IORP II) to add a solvency rule was already signalled by the European Commission in a Green Paper of July 2010. Following strong resistance from stakeholders, however, the envisaged legal initiative was deferred in May 2013. The foreseen preferential capital treatment of government bonds, similar to that in Solvency II, reportedly affected the investment portfolios of occupational pension funds. This proposed government privilege (only) enters the de facto index, with a score of 9 (excluding an own risk and solvency assessment) for the period July 2010 to May 2013.

7. The Commission published its legal proposal for the *European Market Infrastructure Regulation* (EMIR) in September 2010; it entered into force in August 2012, exempting official public debt management operations involving over-the-counter derivatives from central clearing. This exemption

is treated as a de jure government funding privilege with a score of 10, but only as from March 2013, when the first EU central counterparty was authorised to offer mandatory clearing services. In the de facto index it enters with the same value, but already from the third quarter of 2010.

EMIR furthermore increases the net demand for high-quality collateral, notably sovereign bonds, on a structural basis. This second government financial privilege enters the de jure index, but only with a score of 2.5 as from March 2013, because cash plays an important role as alternative collateral and central counterparties can only accept high-rated government securities subject to a valuation haircut and concentration limits. Market participants requiring collateral for clearing purposes will have anticipated the additional demand for high-quality government bonds. This government privilege is covered in the de facto index as from the third quarter of 2010, with the same (low) score of 2.5.

The third sovereign privilege related to EMIR is that central counterparties are themselves required to observe similar capital adequacy rules as the banking sector. Hence, the same preferential treatment of claims on sovereigns applies (with an average score of 9) and is included in the two variants of the index as from March 2013, when the first EU central counterparty was registered.

8. The government funding privilege associated with the *EU regulation on credit rating agencies* takes as a starting point July 2011, the date when the agencies were placed under ESMA supervision, as this could be regarded as making it de facto more difficult for them to downgrade European sovereigns or to place them on a negative outlook. The European Commission proposed tighter rules for issuing sovereign credit ratings in November 2011, which took legal force in June 2013. The quasi-fiscal benefit of this tightening appears both in the de facto and the de jure index of government funding privileges with a score of 5 as from mid-2011 and mid-2013, respectively.

9. The Commission's legal proposal for an *EU regulation on short-selling and credit default swaps* was published in September 2010. This is the date when the associated government funding privileges enter the de facto index, with a modest score of 5 for the constraints on uncovered short-selling of shares and debt instruments and a full score of 10 for the outright ban on uncovered sovereign CDS contracts. The same two scores are assigned for the de jure application from November 2012.

10. The *common financial transactions tax* (FTT) to be implemented by 11 euro area countries is still undergoing technical work and therefore not (yet) included in the de jure index of government funding privileges that are actually in force. The announcement date refers to the initial European Commission proposal of February 2013. This was followed by the May 2014 commitment of the participating countries to take a first step by introducing a common financial transactions tax for shares and some derivatives, with the start date still being uncertain (in the meantime, Estonia stepped out). The fact that in this first step both public and private bonds are exempted from the tax mitigates the extent of the sovereign privilege. The de facto index includes a modest full-year score of 5 from February 2013 for this anticipated preferential treatment with respect to the common financial transactions tax.

Annex Table A - Preferential treatment of government debt in European financial law

EU prudential legislation	Nature and extent of preferential treatment
1. EU banking regulation/directive (CRR/CRD IV)	
a) Capital adequacy requirements (unchanged)	EU sovereigns in domestic currency risk free,
	but phased out for non-domestic EU currencies
EBA capital exercise	Temporary capital buffer against sovereign risk
b) Liquidity coverage ratio/diversification rule	EU sovereigns highest liquidity and credit quality
c) Net stable funding ratio	EU sovereigns highest liquidity and credit quality
d) Large exposures regime	Exempts EU sovereign bonds,
	but sovereign concentration risk a bank issue
e) Leverage ratio	Focus on total non-risk weighted assets
2. EU banking structure regulation (proposal)	
a) Ban on proprietary trading	Exempts EU government securities
b) Separation of high-risk investment activities	Exempts EU government securities
3. EU investment funds directive (UCITS IV)	
a) Portfolio diversification rules (unchanged)	Allows much higher limits for public sector exposures,
	but a higher limit also for covered bonds from banks
b) Portfolio concentration limits (unchanged)	Allows waiver for public sector bodies
4. EU regulation on money market funds (MMF)	
a) Public sector CNAV money market funds	Excludes private debt, possible future EU public debt quota
b) Favourable assessment of issuer and quality of assets	Exempts EU public debt instruments
c) Portfolio diversification rules	Allows much higher limits for public sector exposures,
	but a higher limit also for secure bonds from banks
d) Portfolio concentration limits	Exempts public sector bodies
e) Resilience against redemption pressures	Mandatory risk assessment/management for all assets
5. EU directive for insurance undertakings (Solvency II)	
a) Asset diversification requirement (Solvency I)	Allows to exempt government securities
a) Capital requirements for specific market risks	Exemptions for concentration risk and spread risk
	related to EU sovereigns in domestic currency,
	but phased out for non-domestic EU currencies
c) Own risk and solvency assessment (ORSA)	All assets valued at market prices, prudent person principle
6. EU directive for occupational pension funds (IORP II)	
a) Asset diversification requirement (unchanged)	Allows to exempt government securities
b) Capital requirements (deferred)	As Solvency II (excl. ORSA)
7. EU market infrastructure regulation (EMIR)	
a) Mandatory central clearing of OTC derivatives	Exemption for official public debt management
b) Only high-quality and liquid collateral	Favours high-quality sovereign bonds
c) Capital requirements for central counterparties	As CRR/CRD IV
8. EU regulation on credit rating agencies	Restrictions on sovereign credit ratings and rating outlooks
9. EU regulation on short-selling and CDS contracts	Restricts uncovered short-selling and
	bans uncovered sovereign CDS positions
10. Common financial transactions tax (FTT) (proposal)	
a) Common financial transactions tax under enhanced cooperation	Curbs trading in all financial instruments except primary issuance and public debt management
b) 1st step: shares and some derivatives	Exemption of public and private debt

Annex Table B - Scoring government funding privileges in European financial law

EU prudential legislation	Scoring of privilege de facto / de jure	
1. EU banking regulation/directive (CRR/CRD IV)		
a) Capital adequacy requirements (unchanged)	Privileged access to banks,	10 / 10
	but a small part is removed	0 / 0
EBA capital exercise	Offsets privileged access to banks	-10 / 0
b) Liquidity coverage ratio/diversification rule	Privileged access to banks	10 / 10
c) Net stable funding ratio	Privileged access to banks	10 / 2
d) Large exposures regime	Privileged access to banks,	10 / 10
	but within bank-specific risk limits	-2 / -2
e) Leverage ratio	Limits privileged access to banks if binding	-2 / -2
2. EU banking structure regulation (proposal)		
a) Ban on proprietary trading	Privileged access to banks	10 / 0
b) Separation of high-risk investment activities	Privileged access to banks	10 / 0
3. EU investment funds directive (UCITS IV)		
a) Portfolio diversification rules (unchanged)	Allows privileged access to investment funds,	9 / 9
	but to some extent also for banks	-2 / -2
b) Portfolio concentration limits (unchanged)	Allows privileged access to investment funds	9 / 9
4. EU regulation on money market funds (MMF)		
a) Public sector CNAV money market funds	Privileged access to money market funds	10 / 10
b) Favourable assessment of issuer and quality of assets	Privileged access to money market funds	10 / 10
c) Portfolio diversification rules	Allows privileged access to money market funds,	9 / 9
	but to some extent also for banks	-2 / -2
d) Portfolio concentration limits	Privileged access to money market funds	10 / 10
e) Resilience against redemption pressures	Sets fund-specific risk limits	-5 / -5
5. EU directive for insurance undertakings (Solvency II)		
a) Asset diversification requirement (Solvency I)	Allows privileged access to insurers	9 / 9
b) Capital requirements for specific market risks	Privileged access to insurers,	10 / 10
	but a small part is removed	0 / 0
c) Own risk and solvency assessment (ORSA)	Sets insurer-specific risk limits	-5 / -5
6. EU directive for occupational pension funds (IORP II)		
a) Asset diversification requirement (unchanged)	Allows privileged access to pension funds	9 / 9
b) Capital requirements (deferred)	Privileged access to pension funds	9 / 0
7. EU market infrastructure regulation (EMIR)		
a) Mandatory central clearing of OTC derivatives	Privileged access to derivatives traders	10 / 10
b) Only high-quality and liquid collateral	Privileged access to derivatives traders	2.5 / 2.5
c) Capital requirements for central counterparties	Privileged access to central counterparties	9 / 9
8. EU regulation on credit rating agencies	Reduced market volatility	5 / 5
9. EU regulation on short-selling and CDS contracts	Reduced short-selling market volatility	5 / 5
	Reduced sovereign CDS market volatility	10 / 10
10. Common financial transactions tax (FTT) (proposal)		
a) Common financial transactions tax under enhanced cooperation	National budget revenues, privileged treatment of government debt and institutional investors	0 / 0
b) 1st step: shares and some derivatives	Lower-costs for public/private debt transactions	5 / 0

5.5   Assessment and conclusion

The overhaul of European financial governance addresses seven weaknesses that have come to the fore in the wake of the global financial crisis. Some elements in this reform signal a revival of market access and debt resolution privileges for governments.

First, the tightening of EU financial sector regulation and supervision aims to ensure that financial institutions hold adequate capital and liquidity buffers and concentrate on providing long-term lending to the economy rather than speculative activities. This reflects legitimate concerns, notably about the insufficient resilience of financial institutions to adverse shocks and taxpayers having to bail out 'too-big-to-fail' systemic banks. At the same time, most government securities continue to be valued as 'high quality' and 'liquid' assets carrying zero-risk by definition, which moreover are exempted from large exposure limits. Similarly, the proposed common financial transactions tax to curb speculative trading may exclude trade in government securities. This favourable treatment of public sector compared to private sector instruments can be found in a growing body of EU financial legislation and fully exploits the opening in the EU Treaty that allows preferential government access to financial institutions for prudential reasons. EMU countries benefit the most from this privilege, since euro area financial firms can generally place their funds in the euro-denominated bonds of any eurozone country without having to weigh the associated credit and exposure risks, or specific market risks.

Second, new EU financial market regulations related to short-selling, credit default swaps and credit rating agencies seek to make the financial system less speculative, less short-termist and less volatile. But these regulatory measures also contribute to ring-fencing governments against market pressure. They establish a new financial privilege for EU countries that is of particular value in times of volatile and rising interest rates, when their solvency may be in doubt, their credit ratings are downgraded, their bonds could face short-selling pressures and investors wish to buy sovereign default protection. This may be successful in silencing the market's voice of concern about derailing fiscal positions.

Third, the new euro area rescue funds offer financial assistance to euro area countries in a funding crisis. In addition, the EFSF/ESM tools for intervention in sovereign bond markets should counter the excessive risk premia that euro area governments in distress are otherwise unable to control in full. An open question is whether this common fiscal backstop will be limited to preserving and facilitating market access rather than suppressing market discipline. Moreover, the conditionality attached to these official support mechanisms could turn out to be less strict than warranted and actual compliance weaker than envisaged.

Fourth, the willingness of the ECB to stand guard for the euro with conditional but unlimited interventions in short-term government bond markets added a monetary backstop to the EFSF/ESM intervention tools. The focus of the OMT on eliminating 'tail risk' in government bond markets and the acceptance of equal (pari passu) treatment with other creditors shows that the ECB's commitment to undertake public debt purchases is meant to preserve market discipline for the sovereigns concerned while avoiding a seniority status that could distort normal price discovery. Moreover, the ECB

maintains its discretion to (dis)continue the OMT depending on a continued monetary policy need and effective compliance with conditionality. Although the ECB did not need to implement the OMT, its credible commitment to do so when the conditions are fulfilled was effective in removing the currency convertibility risk premium in sovereign bond yields and reducing financial market fragmentation.[59] This supported the ECB in carrying out its mandate to maintain price stability throughout the euro area. At the same time, governments enjoyed a substantial decline in sovereign bond yields and thus cashed in the OMT bonus without having to make any new policy commitments in return.

Fifth, by agreeing to introduce CACs in new euro area government securities issued as from 2013 Europe has taken a small step towards establishing an orderly sovereign debt restructuring mechanism for exceptional cases. As such, CACs make it easier for a government under unbearable fiscal stress to dispose of a debt overhang. The resulting moral hazard should be contained by stronger market pressure to maintain sustainable public finances. For this to happen, the risk premium in interest rates should rise as private investors become more cautious in buying sovereign bonds, knowing that they may eventually be hit by a default and their claims will be subordinated to those of the official sector. However, the availability of official sector support in times of fiscal stress could negate this disciplinary effect. Some empirical studies suggest that on balance the use of CACs in bond contracts is associated with lower yields, notably for mid-rated sovereigns, and not with higher interest rates.

Sixth, the new EU framework for bank recovery and resolution clarifies that in the end unviable systemic banks will be allowed to fail at the expense of their shareholders, creditors and eligible depositors rather than being rescued at the cost of the public purse. This restores healthy market conditions by protecting taxpayers from having to bear losses that normally should remain private. As the early experience has shown, there is an issue of time inconsistency because in stressful financial conditions and under political pressure national governments may prefer to renege on their promise to first bail in the private sector, in particular when liquidating non-systemic banks. There is in any case no government funding privilege arising from private sector involvement in bank resolution, whereas a continued involvement of taxpayers would support national incentives for financial repression to relieve the fiscal burden.

Seventh, the experience with bank resolution in Cyprus, where in the first instance a stability levy was placed on all deposits of the whole banking sector, showed how under strong market pressure an expropriation of insured savings came to be seen at the European level as a political solution to a country's combined fiscal and banking crisis. As a result of almost reneging on the EU promise that retail deposits up to EUR 100,000 would be safe, Cyprus had to introduce temporary administrative measures to address a bank run and prevent massive capital outflows. This sequence of events in Cyprus could probably have been prevented if a European Banking Union had already been in place.

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[59] This achievement must be seen in conjunction with the June 2012 agreement of euro area leaders to break the pernicious sovereign-bank feedback loop by establishing centralised banking supervision and resolution and then to allow the ESM to directly recapitalise troubled banks.

Altogether, the overhaul of European financial governance represents a shift from relatively lenient market rules and a fragile EMU to more intrusive market regulation and a less crisis-prone eurozone. This transition also entails a growing number of government privileges in European finance which constrain the effectiveness of capital markets in ensuring fiscal discipline – notably where they help less solid countries to secure their short-term funding needs and keep interest rates at affordable levels by being able to draw on a more captive investor base. In an exceptional situation troubled member countries may even be expected to introduce capital controls, confiscate private savings, or restructure public debt at the expense of subordinated private creditors. Hence, the shift from market freedom to more constrained market powers that is apparent in the process of financial reform in Europe also contributes to (further) easing government funding constraints, reducing sovereign bond yields and making the public debt overhang appear as sustainable.

The composite index constructed in this chapter, covering 10 selected reforms of EU prudential legislation introduced or proposed over the period 2008 to 2017, demonstrated that the range of financial favours for (in particular euro area) governments has already increased considerably and it is set to rise further in subsequent years before their total peaks in 2019-2020 due to new privileges being offset by slightly less generous EU prudential legislation elsewhere. Many observers have called upon regulators to remove the government funding privileges in prudential law, or at least to limit them, pointing to the experience with non-safe government debt during the euro area sovereign debt crisis. By contrast, others have argued that euro area governments could further expand their funding privileges by introducing preferential investment rules (see Koo, 2012, discussed in Box 5.2 below).

The wide-ranging changes in European financial governance are driven by the need to counter the adverse impact of the crisis on public finances, the banking sector and the stability of the euro. European policymakers, in particular, seek to create a more resilient financial system and secure financial and monetary stability in the euro area. However, some of their interventions go beyond the apparent need to correct deficient financial regulations, address market failures, preserve market access for governments and remove excessive risk premia in their interest rates. The obvious argument against such a wide and growing array of financial privileges is that it creates significant moral hazard on the part of sovereigns, promoting a debt-bias and inviting opportunistic behaviour.

Governments are likely to become complacent, knowing that they are protected from market pressure in case of unsound national policies that in the end could endanger financial and monetary stability in the euro area. Even the conditionality attached to EFSF/ESM support could be less credible, as troubled countries know that its euro area partners and the ECB are prepared to do "all what it takes" to preserve the euro and the ultimate way out is an expropriation of private wealth. This political constellation heavily relies on a strict application of the reinforced EU economic governance framework and the effectiveness of combined market and peer pressure for ensuring sustainable public finances, a resilient financial sector and competitive economies.

Box 5.2 – Keeping government bonds in national hands

The proposal of Koo (2012) is to agree at euro area level to put in place a '*nationals-only rule*' which limits the sale of government bonds to citizens and excludes foreigners. This would reduce the dependence of governments on the pro-cyclical intra-euro area capital flows that have characterised EMU and that became destabilising after the financial crisis. By contrast, investments in private sector financial assets would remain free of capital controls in order to secure the efficiency gains from an optimal international allocation of savings. As resident banks need high-quality assets in their capital base that they can post as collateral in refinancing operations with the ECB, and local pension and insurance funds wish to match their longer-term liabilities with secure assets, there should still be a steady demand for the bonds issued by each national government. However, the public sector would only face the market discipline exercised by domestic investors. As another advantage of his proposal Koo (2012) mentions that the government could run more flexible fiscal policies to fight a recession, as domestic creditors are more likely to accept the necessary higher budget deficits.

There are several legal objections to such an investment restriction. First, the EU Treaty ensures the free movement of capital within the internal market and with respect to third countries. Second, the EU Treaty forbids an investment rule for financial institutions that favours governments. Although a 'nationals-only rule' would not force them to buy their sovereigns' debt, their obvious need for secure and liquid assets makes this almost an imperative.

The investment rule would also create a 'cozy relationship' between sovereigns and domestic banks.[1] This has three negative consequences. First, it limits the competition for 'safe' government lending and domestic financial institutions may therefore be able to realise attractive margins. This would also reduce their interest in and resources for offering credit to the rest of the economy and, hence, crowd out private investment. While governments will face a higher liquidity premium in the absence of foreign investors in the sovereign bond market, they might neutralise any upward impact on yields by exercising moral suasion over financial institutions to accept a below-market return. Second, it goes against the regulatory objective to make the financial sector more resilient to adverse shocks, including those from a distressed sovereign (Gros, 2013). Third, it increases the risk that national supervisors engage in forbearance towards distressed banks in their jurisdiction out of fear for the economic and fiscal consequences of intervening (ESRB, 2012). This means that banks will remain undercapitalised and may prefer to roll over impaired household and corporate loans rather than having to recognise losses that would further raise solvency concerns.

On balance, under a 'nationals-only rule' governments would still need to make sure that their bonds are attractive for their own citizens. Under circumstances these may prefer to switch to (domestic or foreign) private assets and create market pressure. Governments may also be confronted with evasion. Foreigners could circumvent the investment rule by investing in domestic private funds that are allowed to buy the government debt issued in their jurisdiction. To make the 'nationals-only rule' work, governments could even seek to close these two loopholes by preventing the outflow of private assets or by directly enforcing below-market sovereign bond yields.

1 A 'nationals-only rule' is similar to a restriction which was applied for example in Belgium for decades, where until 1989 foreign banks were banned from lending directly to the public sector. Even foreign banks established in the country could not profit from the lucrative "cozy relationship" between the public sector and domestic banks (see Wyplosz, 2001).

5.6   References

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6. Monetary policy and the secular decline of interest rates in the euro area

Keynes believed that "in the long run we are all dead," whereas Hayek believed that in the long run we learn wisdom. Robert Skidelsky (2006, p.85).

6.1 Introduction

Market interest rates have been on a declining trend over the past 35 years in all advanced economies and have reached record-low levels after the global financial crisis of 2008 (see Figure 1.2). The euro area was no exception; in fact, after the banking sector had been stabilised and the sovereign debt crisis had played out, some interest rates came further down than elsewhere. Over the course of 2014, the ECB further cut its already low monetary policy rates and broke through the 'zero lower bound' in order to counter deflationary pressures. Longer-term bond yields fell markedly under the influence of a variety of factors including the ECB's non-standard monetary easing operations and in several euro area countries they reached negative values in 2016. Among others, Gagnon (2016) has posed the question of whether the arrival of ultra-low interest rates in advanced economies is natural or artificial.

Central banks use their official interest rates to determine the monetary policy stance that they consider appropriate for achieving their final objective(s) as defined by their mandates. One side of the debate is that the reduction in monetary policy rates did not keep up with the downward path of the natural or neutral (real) interest rate that balances desired savings and planned investments. Others argue that the decline in this equilibrium real interest rate can be ascribed, at least in part, to the conduct of monetary policy because it distorted the free market discovery process between borrowers and lenders. This chapter reviews the two main theories behind these opposing views, namely the secular stagnation hypothesis of Keynesian origin and the financial repression doctrine linked to the Austrian business cycle theory of Mises and Hayek, with an application to the euro area.

The first theory argues that the advanced economies entered an era of *secular stagnation* characterised by low or even negative equilibrium real interest rates. Some observers explain the fact that economic performance steadily disappointed by a trend slowdown of potential growth due to supply-side restrictions such as heavier public regulation and a lower capacity to innovative. Others point to phenomena with a persistent impact such as a 'global savings glut' in combination with an investor strike (see the contributions in Teulings and Baldwin (eds.), 2014, and the overview by Arsov and Ravimohan, 2016). However, in the Keynesian tradition, the notion of secular stagnation reflects a chronical shortage of aggregate demand arising from the propensity to save being structurally higher than the propensity to invest. This generation-long drag is caused by changes in the structure of the economy that – in the words of Summers (2014, p.69) – "have led to a significant shift in the natural balance between savings and investment, causing a decline in the equilibrium or normal real [interest] rate that is associated with full employment". The excess in desired savings in his view reflects long-lasting non-monetary factors such as the uncertainty over post-retirement income and the decline in the working-age population as well as a failure of markets and monetary policy to restore equilibrium.

Since the early 1980s, governments have generally put central banks in charge of macroeconomic stabilisation while concentrating fiscal policy on other objectives. Many central banks adopted an interest-rate rule (first implicitly, later explicitly) which prescribed that the monetary policy rate should be equal to the neutral interest rate that is consistent with a balanced economy with low and stable inflation and set below or above that neutral level to correct an expected macroeconomic disequilibrium. The proponents of secular stagnation argue that central banks have mostly kept their monetary policy rates too high to match the decline in neutral rates caused by a higher propensity to save compared to planned investment. When responding to cyclical contractions, the monetary stance was often too tight to absorb the growing amount of unused resources in the economy. Without demand support from fiscal policy, so the argument goes, this persistent overcapacity has translated into disappointing economic growth and subdued inflationary pressures. More satisfactory output growth was achieved only when central banks allowed the excess in desired savings (part of which came from abroad) to be absorbed by new credit, while ignoring the financial risks from rising private debt-to-income ratios and asset price inflation.

After the global financial crisis the economy has fallen into a liquidity trap where the economy is depressed, the short-term interest rate has reached the zero bound and the neutral rate of interest is negative. Summers (2016) believes that this analysis may be of particular relevance for Europe and Japan where nominal interest rates are extraordinarily low and long-run inflation expectations well below 2%. Secular stagnation implies that monetary policy rates in real terms cannot be reduced below the neutral interest rate to clear the product market at full employment and bring inflation back in line with the target. Since conventional monetary policy using the short-term interest rate has become powerless, central banks have taken resort to unconventional measures to reduce longer-term market rates and revive credit growth. Given the risk of adverse side-effects of prolonged ultra-low interest rates for financial stability, the proponents of the secular stagnation theory instead favour governments to provide a strong fiscal stimulus to catapult the economy into a higher growth orbit.

Economists supporting the second theory see the onset of ultra-low interest rates after the crisis as reflecting a new age of *financial repression* at the expense of savers (Eijffinger and Mujagic (2012), i.e. a public policy of financial market interventions with the aim to suppress interest rates and direct credit at favourable conditions to the government or to politically supported entities. The fact that the major central banks in advanced economies have intervened heavily in money and capital markets in order to maintain very low interest rates far out the sovereign yield curve with fiscal and quasi-fiscal implications indicates that a regime shift has taken place, back towards a more political role for monetary policy. A renewed political dominance over money and finance, if confirmed, would protect wasteful public spending and uneconomical private projects from corrective market pressure and crowds out credit for profitable investments that cannot rely on public policy support.

The financial repression doctrine is concerned with the efficiency of financial markets in allocating scarce savings to productive capital rather than the government and in this sense directly appeals to the

Austrian School (see also Chapter 2). Since the mid-1980s, many central banks have replaced monetary targeting and/or credit control by the short-term interest rate as their operational target to achieve their mandated macroeconomic objective(s). The Austrian business cycle theory argues that they frequently kept the monetary policy rate below the natural free market level in order to stimulate aggregate demand. This asymmetric conduct of monetary policy, coupled with the credit-creating incentives of a profit-oriented banking system, was in this view a causal factor behind the falling trend in nominal and real interest rates. The downward bias in interest rates distorted the intertemporal allocation of resources and as a result the growing amount of bank credit (which the Austrian School sees as 'forced saving') fuelled prolonged phases of overconsumption and malinvestment in both the private and public sector, leading to repeated boom/bust cycles around a falling potential growth path.

The relevance of this analysis was exemplified by overly relaxed pre-2008 monetary policies, which fuelled a housing bubble in several advanced economies and had to lead to a financial crisis. Central banks responded to the credit crunch and the Great Recession as crisis managers by swiftly lowering the monetary policy rate (close) to the zero lower bound and providing ample liquidity in their role as 'lender of last resort', while governments undertook fiscal stimulus measures to prevent a deflationary spiral. Although output growth rebounded, many countries entered a drawn-out deleveraging process characteristic of the downward phase of a debt-driven 'super-cycle' (Rogoff, 2015). As the advanced economies experienced a more sluggish recovery than expected and fiscal policies nevertheless turned to austerity, central banks continued their monetary expansion using unconventional tools like large-sale capital market interventions to further relax financial conditions (Hoffmann and Schnabl, 2016; Schnabl, 2016). Apart from supporting an economic upturn, this monetary policy reaction also kept fragile banks alive, slowed down balance sheet repair and delayed crisis resolution (Borio, 2017). The prolonged phase of ultra-low interest rates eased funding strains of weakened governments, struggling companies and over-indebted households, thereby distorting the unavoidable market-driven correction of misallocated resources and constraining longer-term growth. The Austrians expect that the too low interest rates will again trigger misdirected credit growth and a sub-optimal capital structure and lay the foundations for the next unsustainable financial boom and a further decline in potential growth.

The financial repression thesis states that governments will need to ensure sound public finances as a precondition for successfully accessing capital markets at favourable interest rates in free competition with private creditors. The public sector should also retreat from activities that can be undertaken more efficiently by the private sector and refrain from directing credit and taxing finance on a selective basis. While acknowledging the benefits of financial and monetary stability, the legal provisions should allow for an equal treatment of public and private debt instruments in order for market discipline to work effectively. Taking an Austrian perspective, stagnating output growth and unnatural low interest rates are the direct result of misconceived monetary policies that through financial market interventions and excessive credit creation caused major market dis-functioning. The Austrian School calls for a free market environment in which 'creative destruction' is allowed to set the economy on a higher growth path and central banks accommodate the market-determined rise in the natural interest

rate that aligns sustainable investments with the forthcoming voluntary savings. A more radical solution would be an organisation of the money and credit system in which central banks are fully responsible for money creation and commercial banks are only able to extend credit that is fully backed by the savings that they can attract in a competitive market environment. Austrian circles in this respect also promote a return to the gold standard and support a free banking society.

This chapter reviews the arguments behind these two alternative explanations for the trend decline in market interest rates and the onset of unnatural low rates seen in the wake of the global financial crisis, and examines their relevance for the specific case of the ECB. The analysis takes place against the background of the evolution of interest-rate targeting as an operational monetary policy tool and the emergence of a new style of central banking involving large-scale public and private sector asset purchases at the zero lower bound for monetary policy rates. This study refrains from an effort to empirically validate either of the two theories explaining the emergence of low interest rates, since for both of them the natural interest rate is a key analytical concept whereas in reality it is an unobservable variable – despite some estimates being available in the literature. Moreover, in the euro area context, the presence of secular stagnation should rather be assessed at the level of the member countries, given the structural heterogeneity of their economic fundamentals (Belke and Klose, 2017).

Over the years, ECB monetary policy has consistently focused on its mandate of maintaining price stability for the euro area as a whole. However, the pre-crisis success in maintaining low and stable consumer price inflation at the euro area level was unsustainable in a situation of diverging member economies with Austrian-style imbalances. After the outbreak of the crisis, the ECB gave priority to stabilising the euro area economy and repairing broken monetary transmission channels as prerequisites for the effective conduct of monetary policy. The monetary efforts to establish more affordable borrowing rates in the crisis-affected member countries have unavoidably contributed to delaying the necessary reallocation of resources. The ECB then initiated a demand-led recovery so as to counter secular stagnation and the threat of deflation. This effectively required financial repression favouring vulnerable countries in order to enforce interest rate convergence. Long-lasting monetary easing further reduced already very low sovereign yields in the safe-haven countries, creating risks of driving a financial cycle of overconsumption and malinvestment as predicted by the Austrian School.

Governments came to depend on the ECB maintaining its accommodative monetary stance, 'buying time' for them to strengthen the EMU architecture, address the legacy of the crisis and ensure sustainable economic and financial convergence. Their political hesitation to do all what is needed to safeguard euro area stability put pressure on the ECB to prolong unnatural low interest rates and effectively undermined the credibility and independent conduct of the single monetary policy.

This chapter is organised as follows. Section 6.2 presents a taxonomy of different types of interest rates that are of relevance to monetary policy. Section 6.3 discusses the concept of secular stagnation and the view that non-monetary factors of a structural nature are behind the secular decline in interest rates to ultra-low levels, complicating the task of monetary policy to return the economy to full

employment. Section 6.4 reviews the concept of financial repression as a monetary policy tool to favour public finances and links its economic effects to the Austrian business cycle theory. Section 6.5 reviews the change in monetary policy strategies after the mid-1980s, leading many central banks to adopt a reaction function for their short-term interest rate that pays little attention to money and credit growth. The post-crisis new style of central banking, seeking to exercise more direct control over the sovereign yield curve and financial asset prices in general are the subject of Section 6.6. Section 6.7 examines the conduct of ECB monetary policy during 1999-2016 and its favourable impact on the public finances of euro area countries. Section 6.8 concludes on the distinction between central banks as followers or leaders of the trend decline in real interest rates and the risks for central bank independence, in particular for the ECB.

6.2 A taxonomy of interest rates relevant for monetary policy

This section discusses a variety of interest rates, trying to clarify the existing confusion about the relevant interest rate benchmark for monetary policy and related types of interest rates.

Wicksell (1898) introduced the 'natural' interest rate, an equilibrium concept, which one century later was embraced by mainstream economists as well as many central banks as the benchmark for the monetary policy rate. He in fact proposed three definitions, which triggered heated debates among later academics as to their exact meaning and the right one to follow (see for example Weber et al., 2008; Salerno, 2016). The first description defines the natural rate as "the rate of interest at which the demand for loan capital and the supply of savings exactly agree". This natural or normal loan rate can be interpreted as the equilibrium interest rate in the loanable funds market where the demand for investment funds coming from producers meets the desired savings of consumers. Wicksell's second statement was that this first natural loan rate "more or less corresponds to the expected yield on the newly created real capital", i.e. the expected real return on investment throughout the economy's capital structure. This natural rate stands for the marginal efficiency of capital over time and corresponds to the market equilibrium for goods in which wages and prices are stable. Most frequently quoted, is his third idea that "there is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them." This neutral rate is understood as a balanced economic situation in which the demand and supply for goods are in line with each other and there is price stability. Moreover, he had in mind a commodity-based barter economy in which no use is made of cash and lending takes place in the form of real capital goods.

Mises (1949) presented the 'originary' interest rate as a relative price of immediate and later satisfaction of needs that manifests itself in the market economy as the money rate at which future goods are discounted against present, otherwise identical goods, reflecting individual preferences. The originary interest rate gives a value to consumption in the present relative to the same consumption in the future and determines how much of the available supply of goods is to be devoted to consumption in the immediate future and how much to provision for remoter periods of the future. Since "men are faced with scarcity and must act and economize; they are forced to choose between satisfaction in

nearer and in remoter periods of the future because neither for the former nor for the latter can full contentment be attained" (Mises, 1949, p.525). For an evenly rotating market economy, in which money is neutral, the interest rate in the loan market coincides with the originary interest rate and may be called the neutral rate of interest. This neutral interest rate is equivalent to the rate of time preference assuming that expected inflation or risk premia can be ignored. In a constantly changing market economy, however, everything is in flux and there is only a tendency towards a uniform originary interest rate. Moreover, loan rates will have to include premia for anticipated price changes and various risks and no neutral rate of interest can be established.

As explained by Block (1978), the originary interest rate can never be negative (in contrast to the financial market rate) because of the universal law of time preference for the present, i.e. fulfilling a desire in the present instant is always preferred to that at a later moment – other things being equal. The reason that the value of holding money could still turn negative is the inclusion of additional factors, such as storage costs or insurance premia. The willingness to bear the related costs will be reflected in a market price of cash below the originary interest rate. Similarly, a flight to safety in capital markets during a crisis may push the market yield on top-rated government bonds below the normal interest rate because investors value the non-pecuniary return of holding a safe store of value.

Just like Wicksell, Hayek (1931) stressed the intertemporal dimension of the natural interest rate as embodied in the production structure of the economy. He saw the natural rate as the yield on capital in production that aligns the investment plans of producers with the saving preferences of consumers over time. Current saving involves deferring consumption into the future and freeing up resources for current investment that creates the production capacity to supply that future consumption as part of a 'roundabout process'. Any mismatch created between the market rate and the natural rate will distort the structure of production as the goods produced by the stock of capital over time will no longer reflect the preferences of consumers. This makes the growth path of the economy unsustainable and will ultimately lead to a correction.

Garrison (2001) notes that Hayek's intertemporal rate of time preference leaves out two additional components of the market interest rate, namely inflation expectations and risk premia, both of which also have an intertemporal dimension and may therefore be independent sources of unsustainable output growth. With positive anticipated inflation the real return on capital deviates from the nominal return. As long as inflation is low and stable economic agents will be able to ignore this small difference when taking their saving and investment decisions. However, higher rates of inflation (or deflation) force them to take anticipated price developments into account. With an unstable real value of money the inflation expectations embedded in the production structure are likely to be wrong and in that case will cause unexpected real income losses. A similar story can be told for risk premia, such as for credit risk, liquidity risk and inflation risk. Public policies that downplay the true nature of these risks and induce economic agents to bear more of them and accept lower risk premia will affect saving and investment decisions. Since in a free market environment the assumption of these risks according

to preferences would lead to a different saving and investment behaviour the production structure associated with the policy interventions will be distorted. The risks that are concealed from the risk bearers lead to excessive risk-taking and unsustainable output growth. Market participants will only come to realise their too high risk exposure when confronted with unexpected losses.

Keynes (1936, p. 243) added an extra element. Since the interest rate that equals saving and investment can imply any level of employment, there was a set of natural rates corresponding to different employment levels. To pin this level down, he defined the neutral or optimum rate as the "unique and significant" rate which prevails in equilibrium and is "consistent with *full* employment, given the other parameters of the system". The neutral or optimal interest rate in this sense corresponds to a stable macroeconomic equilibrium that reflects widely accepted public policy objectives such as full employment and price stability. Salerno (2016) points out that this definition refers to the market equilibrium for the loan rate, whereas Wicksell saw the natural rate as the real yield of capital used in the production economy to which the loan rate would adjust. The New-Keynesians that refer to the neutral or natural interest rate as a benchmark in interest-rate feedback rules for monetary policy therefore have a different concept in mind than Wicksell's natural rate. Garrison (2006, p. 58) clarifies that "[t]he natural rate of interest is a rate that emerges in the market as a result of borrowing and lending activity and governs the allocation of the economy's resources over time. The neutral rate of interest is a rate that is imposed on the market by wisely chosen monetary policy and is intended to govern the overall level of activity at each point in time."

Amato (2005) argues that the three Wicksellian definitions of the natural rate discussed above are consistent with each other in a simple model with markets for money, bonds and goods whereby the Law of Walras ensures equilibrium across all these markets. He further mentions three important properties of the natural interest rate according to Wicksell: first, it stands for equilibrium in the economy; second, it is a characteristic of the long run, and third, it is essentially a variable rate because the productivity of capital fluctuates over time.

The property of establishing equilibrium across all market makes the natural interest rate an ideal benchmark for monetary policy, as by changing the official interest rate relative to the natural rate and injecting or withdrawing liquidity a central bank can directly influence market interest rates and affect the state of the whole economy. Wicksell (1898) was the first to explain how a banking sector with the ability to create credit 'out of thin air' could expand its business by setting the loan and deposit rates below the normal equivalence of the natural interest rate. The consequent excess demand for loanable funds by investors will be met by banks providing them with credit and creating excess money balances in the economy. This raises the demand for capital goods, increases their relative price and related wages, triggers higher spending and causes the general price level to rise. This so-called 'cumulative process' of inflation (or deflation in the opposite case) continues as long as the interest rate gap persists, including in cases when the natural rate itself has changed and banks fail to adjust the loan rate accordingly.

Alternatively, the provision of credit could be solely in the hands of a single credit institution. This central bank could steer its monetary policy rate relative to the natural rate and directly determine the demand for its credit and the demand for goods. This feedback rule for the policy rate could be employed for achieving stable prices in a commodity economy without a necessary role for money (while assuming a state of full employment). Leaving out the role of money in this cumulative process was for Hayek a fundamental mistake. He noted that a closing of the interest rate gap is not a sufficient condition for price stability; a constant price level depends on money being neutral, i.e. a constellation in which relative prices are not affected or distorted (see Issing and Wieland, 2013). Hayek therefore favoured a neutral rule of keeping the growth of the money supply in line with nominal GDP, taking account of changes in velocity.

Mises and Hayek built on Wicksell's analysis of the cumulative process to develop a theory in which the gap between the loan rate and the natural rate triggers credit-driven business cycle fluctuations. For the Austrian School this business cycle theory is the reason to argue that interest-rate targeting by central banks leads to a distortion of the economic and monetary equilibrium. Manipulation of the market interest rate through monetary policy prevents the natural rate from appearing spontaneously as the outcome of a market discovery process. These monetary policy interventions make the natural rate unobservable and lead economic agents to take misinformed intertemporal saving and investment decisions. Given the political bias in favour of low market interest rates, a discrepancy will arise with respect to the higher (unobserved and shifting) natural rate of interest. Firms and households will react to the too low cost of borrowing by respectively producing and consuming too much interest-sensitive capital and consumption goods, more than the available economic resources allow. This misallocation sets in motion an economic upswing that must lead to a bust to restore the correct relative prices and realign the market interest rate with the natural rate.

The Wicksellian neutral or natural rate has been widely adopted as the benchmark for the monetary policy rate in New-Keynesian dynamic stochastic general equilibrium (DSGE) models, a century later (see Woodford, 2003), in particular by central banks using inflation targeting strategies. The natural interest rate in these models is defined as the real interest rate that would apply once all nominal adjustment processes are complete and the (hypothetical) economy characterised by rational expectations and flexible prices has reached its equilibrium. According to Amato (2005), this formulation of the natural rate represents a synthesis of the three definitions of Wicksell, apart from the fact that the natural rate in New-Keynesian models is a short-term equilibrium real interest rate consistent with price stability on an ongoing basis instead of the equilibrium real interest rate that the economy tends towards in the long run. Furthermore, DSGE models of that generation assume financial markets to be complete and that finance has no real effects. Amato (2005) mentions a number of true-world imperfections in the financial sector (such as risk premia in long-term interest rates, contractual arrangements, portfolio restrictions and erroneous expectations) which could affect the natural rate and thus the transmission of the monetary stance to the economy.

Since these are real business cycle models, money and credit are absent, a remnant of the concept of a cashless barter economy of Wicksell. By definition, the natural interest rate in these models incorporates all the real economic factors (preferences, technology, government spending) that drive output and inflation in the long run but it leaves out monetary and cost-push factors (like the price of oil) as a determinant. Although the gap with regard to the policy rate constitutes an indicator of the monetary stance, Weber et al. (2008), Fahr et al. (2013) and Juselius et al. (2017) believe that it must be complemented by an analysis of money, credit and cost developments to get a full picture of the risks to price stability.

Summarising, at least five different types of interest rates relevant for monetary policy can be distinguished (see also Garrison, 2006; Hoffmann and Schnabl, 2016; Salerno, 2016; Schnabl, 2016).[60]

1. The *natural interest rate* balances the propensity of producers to invest with the propensity of households to save and it emerges in the market from the interaction between borrowers and lenders arising from these private sector preferences. The natural rate of interest governs the allocation of the economy's resources over time along a sustainable growth path and it will shift when the prospective return of employing capital and labour in the production process changes relative prices and time preferences.

2. The *neutral interest rate* ensures macroeconomic equilibrium, as defined in terms of full employment of labour and capital resources as well as price stability, and offers a benchmark for the short-term interest rate at which monetary policy is neither expansionary nor contractionary. This macroeconomic equilibrium is sometimes extended to include financial stability, i.e. the absence of financial imbalances. Given the direct connection to economic objectives formulated by politicians the neutral rate can be regarded as the monetary policy rate imposed on the market by the central bank acting in conformity with its mandate and it may differ from the natural rate that is freely determined by market forces that drive the intertemporal allocation of resources.

3. The *monetary policy rate* is the official or target interest rate of the central bank at which it provides regular short-term liquidity to the banking system, which may be complemented by key policy rates for banks' exceptional liquidity demand and banks' excess reserves held at the central bank and by forward guidance on the expected monetary stance.

4. An *administered interest rate* is directly fixed by a monetary or regulatory authority and may involve ceilings placed on bank deposit rates, bank lending rates or equivalent restrictions placed on capital market rates for fiscal and/or political purposes. This practice of making debt service affordable from the borrower's point of view is associated with financial repression.

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[60] Hoffmann and Schnabl (2016) also mention the *internal interest rate*, i.e. the expected return on planned investments, which is equivalent to the expected profit rate of individual projects that in a market economy will drive firms to start new activities or to expand their existing production capacity. These investment opportunities must be confronted with the saving preferences to determine which of these projects are feasible at the natural interest rate that ensures equilibrium.

5. The *market interest rate* involves a wide variety of fixed or variable rates attached to financial instruments in bank deposit and lending markets, money markets and capital markets. The market rate would be equal to the natural rate only if public authorities refrain from market interventions.

6.3   The secular decline of interest rates: the secular stagnation view

6.3.1   The origin of the secular stagnation view

Secular stagnation refers to a sluggish economic expansion that is continually too weak to realise full employment because of a persisting shortfall of aggregate demand relative to aggregate supply. Since secular stagnation is associated with a very low or negative natural interest rate, traditional monetary policy easing using the official interest rate is constrained by the zero lower bound and has little if any power to address this demand deficiency. Without effective correction mechanisms the prolonged demand recession may lead to hysteresis effects which also drag down potential growth.

The term 'secular stagnation' was introduced by Alvin Hansen, who in his presidential address to the American Economic Association in December 1938 expressed his concern with the prospect of stagnant economic progress in the United States in the wake of the Great Depression and "the problem of full employment of our productive resources from the long-run, secular standpoint" (Hansen, 1939, p.4). He described the essence of secular stagnation as "sick recoveries which die in their infancy and depressions which feed on themselves and leave a hard and seemingly immovable core of unemployment". This formulation was consistent with his earlier publications on anaemic business recoveries which prolonged economic stagnation and the existence of a Keynesian 'underemployment equilibrium'.[61]

To explain economic stagnation, Keynes (1936) introduced the possibility of a liquidity trap, in which planned investment falls short of planned saving at the income level that secures full employment because the real rate of interest exceeds the equilibrium level. The liquidity trap becomes binding when the nominal interest rate is close to zero and the preference for holding liquidity is infinitely high. When the scope for a further cut in the monetary policy rate is exhausted and/or savings are unresponsive to lower interest rates, for example because precautionary concerns dominate, real income will have to fall to reduce desired savings and balance it with investment. As it is very difficult to get out of such a liquidity trap, the economy could be stuck in a depression for a long time, in line with the secular stagnation hypothesis. The task then falls on fiscal policy to absorb the saving surplus and thereby to remedy the aggregate demand shortfall.

Hansen (1939) presented an alternative understanding of the forces behind secular stagnation, seeing the US as a mature economy consistent with the classical notion of a stationary state. He argued that the sharp decline in population growth, the lack of major innovations and the exhaustion of new territories were responsible for inadequate private investment opportunities that could absorb the

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[61]   Backhouse and Boianovsky (2016) offer an extensive treatment of the history of the secular stagnation doctrine.

available private savings. Moreover, state and local government borrowing for public investment had virtually come to a standstill in the late 1930s as they focused on reducing their outstanding debt. These non-monetary structural factors behind the persistent shortfall of aggregate demand weighed heavily as an explanation for secular stagnation in the specific circumstances of the US. At the same time, he pointed to institutional aspects like the growing power of trade unions and monopolistic firms that frustrated wage and price competition and prevented the vigour of market forces to act as an incentive for introducing new cost-saving techniques that could advance economic progress.

Hansen (1939) saw a dilemma in dealing with secular stagnation. On the one hand, refraining from government intervention and leaving the recovery to the recuperative forces of the market economy could risk continued unemployment on a vast scale. This suggested that there was a role for income-creating public spending to achieve full capacity utilisation, consistent with the philosophy of Keynes that – notably in a liquidity trap when conventional monetary policy had reached the limit of its effectiveness – it was up to the public sector to fil the output gap and ensure full employment. On the other hand, Hansen warned against the dangers from a large public sector and unrestrained government spending to achieve full employment. Carried too far, it would stimulate both workers and employers "to take the easy course", leading to a vicious spiral of rising costs and prices and preventing economic adjustment. As a result, "we fail to achieve the otherwise available flow of private investment" (Hansen, 1939, p.14). To resolve this dilemma, he thought that government expenditures should set a floor to a sharp fall in national income like that seen in the Great Depression while the net amount of public spending should be tapered off as national income approached a more acceptable level again.

6.3.2 *Secular stagnation and the equilibrium real interest rate*

Pigou (1943) remarked that in the classical concept of a stationary state the economy could never deviate from the full-employment equilibrium in the long run. Yet, he examined the case in which a stationary state with full employment can only be attained when the (natural) interest rate is negative in equilibrium. A stationary state in equilibrium ensures that the expected return on capital that balances saving and investment is equal to the (natural) rate of interest. This (natural) interest rate is the same as the discount rate that the representative agent applies to his/her future real income from savings (i.e. the rate of time preference). Pigou (1943, p.346) noted that people also save (and hence invest) for other reasons than to secure an income, out of "the desire for possession as such, conformity to tradition or custom and so on". Even when the discount rate always had to be positive, this suggested that the (natural) interest rate could be nil or negative in some circumstances, even in equilibrium. However, in a stationary state the relative value of future goods is expected to be the same as their present value. This meant that the (natural) interest rate cannot be negative. With the nominal interest rate standing at the zero lower bound, full employment could still be ensured by falling wages and prices leading to higher cash balances in real terms, as the positive wealth effect from growing real "possessions" would reduce the desire to save out of income (the Pigou effect).

Following this suggestion, Klein (1947) identified secular stagnation with a negative natural interest rate in a Keynesian model. This idea was corroborated by empirical findings for the interwar period that the interest-rate elasticity of both saving and investment in the US was small and other explanatory factors dominated their behaviour. Changes in the market rate could therefore not be relied upon to resolve a discrepancy between desired saving and planned investment (let alone when the market rate had reached the zero lower bound). Neither was the automatic demand support from the Pigou effect, when prices were falling, a very strong or reliable substitute. To stop an unstable deflation and lift the economy out of its stagnation, the state had to create income in order to balance ex ante saving and investment at full employment. As noted by Backhouse and Boianovsky (2016), this interpretation gave the secular stagnation thesis a strong Keynesian flavour.

Conventional monetary policy is in this constellation constrained by the zero lower bound for the official interest rate. Adjusted for the expected or targeted positive rate of inflation, the central bank can, at most, achieve the negative market real interest rate (r^m), which is still above instead of below the negative equilibrium real interest rate (r^e), as in equation (6.1):

$$r^e < r^m < 0 \qquad\qquad\qquad (6.1)$$

The excess supply of loanable funds S (or savings) forthcoming at the too high market real rate (r^m) implies a shortfall in the aggregate demand for loanable funds D (or investment; Figure 6.1). Hence, output growth is lower than necessary to achieve full employment, a situation which traditional monetary policy cannot address.

Figure 6.1 – Secular stagnation: negative equilibrium real interest rate
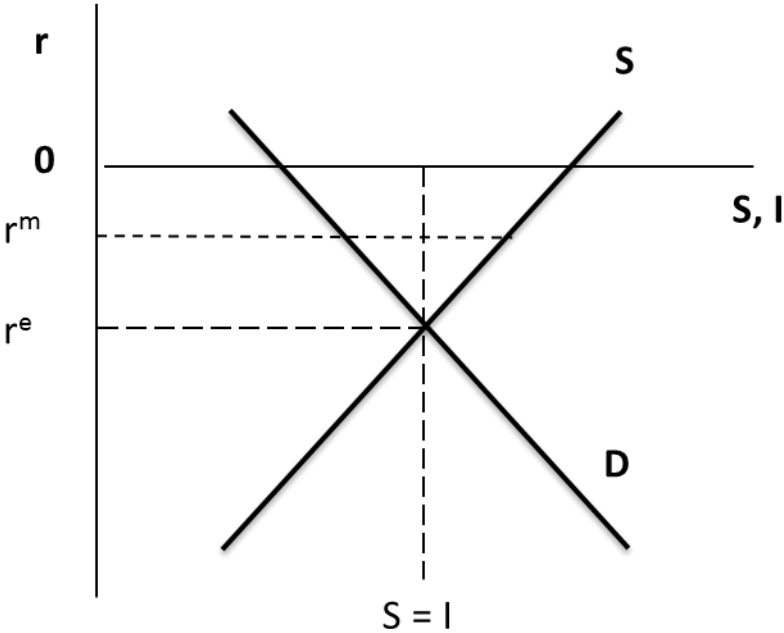
Note: S = real supply of loanable funds, reflecting propensity to save S; D = real demand for loanable funds, reflecting propensity to invest I; r = real interest rate; r^e = equilibrium real interest rate; r^m = market real rate.

Paul Samuelson (1948) introduced secular stagnation in his economics textbook together with the opposite case of 'secular exhilaration', i.e. a situation of excessive private investment driven by rapid population growth and a high pace of innovation. Also in his analysis, an economy trapped in secular stagnation justified running budget deficits to return to full employment. With the real interest rate expected to be negative or zero indefinitely any public investment plan with a positive real return could pay for itself, even when it was meant to "level a hill" in order to save transportation costs (see also Bernanke, 2015). The additional public sector demand would support the profitability of private investment projects and raise the economy's equilibrium real interest rate to a level above zero again.[62]

Nearly 30 years after Alvin Hansen, in December 1967, Milton Friedman noted in his presidential address before the American Economic Association that the post-war expansion of the US economy could be described as secular exhilaration, instead of the secular stagnation feared by Hansen and many other disciples of Keynes (Friedman, 1968, p.14). Just like the US, many industrialised countries had experienced inflation rather than depression. As inflation rose but administered and market interest rates were pegged at low levels, central banks managed to maintain subdued real interest rates at the cost of generating an artificial credit-driven demand impulse with inflationary consequences. At the same time, the real value of government debt outstanding diminished and the debt service burden declined in real terms, thereby artificially creating fiscal space for demand management purposes.

6.3.3   The present age of secular stagnation

After the global financial crisis Larry Summers (2014) was the first economist – soon followed by others – to proclaim that the advanced economies had entered the age of secular stagnation with consequences for the effectiveness of monetary policy and the role of fiscal policy in macroeconomic stabilisation. According to Summers, the industrial world suffers already for a generation from an increasing propensity to save and a decreasing propensity to invest. This has steadily pushed down the equilibrium real interest rate r^e (or rather the medium-term real yield curve), eventually into negative territory, which is a symptom of demand-driven secular stagnation.

On his closer examination, the Great Moderation of the 1990s during which the advanced economies enjoyed both stable growth and low inflation could not only be explained by the success of central banks in re-establishing monetary policy credibility. A number of persisting factors caused the economy to move to a permanently lower growth gear, which also dampened inflationary pressures (see Summers, 2015a,b; 2016). On the one hand, higher desired savings were driven by the growing income share of the wealthy, the increasing uncertainty whether post-retirement income would be sufficient as life expectancy increased, the steady accumulation of financial assets by central banks and sovereign wealth funds, and the post-crisis pressure to reduce high leverage. On the other hand, the propensity to investment was reduced by the slowdown in population growth and the labour force,

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[62]   Subsequent editions of his textbook referred to the US unemployment rate from 1952 to 1960 standing higher at every successive cyclical peak. Although the economy was not stagnating, Samuelson believed that a fiscal expansion was appropriate in these circumstances to address persistent sluggish growth (see Backhouse and Boianovsky, 2016).

the slower pace of technological progress, the demassification of the economy, the falling price of capital goods and the post-crisis restricted availability of credit. Additional factors were the interaction between inflation and after-tax real interest rates, the growing frictions in the intermediation between savers and investors and the high global demand for safe assets that after the crisis put a premium on safe and liquid stores of value.[63]

Several authors have constructed estimates of the equilibrium real interest rate linked to the trend decline in real GDP growth and other factors. Building on the Laubach and Williams (2003) model, Holston et al. (2017) calculate that the (short-term) equilibrium real interest rate (which they take to be the natural rate) has fallen in the United States, the United Kingdom and Canada from about 2.9-3.5% in 1990 to around 2.5% in 2007 and then markedly further to 0.4-1.5% in 2016 (average of first three quarters), showing a close co-movement between these economies over time. For the euro area, these authors find that the equilibrium real interest rate has come down from 2.5% in 1990 to 2.1% in 2007 and was a negative 0.3% in the first three quarters of 2016 (Table 6.1). The statistical margins of uncertainty around all these point estimates are very large, making the exact level of the equilibrium real interest rates open to debate (see, for example, Taylor and Wieland, 2016; Juselius et al., 2017). A fundamental objection to these calculations is that the natural interest rate is an unobserved variable and as such cannot be measured with any degree of confidence.

Table 6.1 – The trend decline in equilibrium real interest rates
(estimates in percentages)

	1990	**2007**	**2016**
United States	3.5	2.3	0.4
United Kingdom	2.9	2.6	1.5
Canada	3.2	2.5	1.3
Euro area	2.5	2.1	-0.3

Source: Holston et al. (2017, Table 3, p. S66).

Note: 2016 estimates are averages of the first three quarters.

Summers argues that the monetary authorities of the advanced economies were chasing a declining equilibrium or neutral real interest rate. As their policy rates could not keep pace, the monetary stance was on average too tight for achieving low inflation as well as full employment. The economy only grew at an adequate pace when it was based on the unsustainable foundations of higher private borrowing that transformed the excess supply of savings into unproductive investments, as manifested by the US housing bubble between 2003 and 2007. As monetary policy rates reached the zero lower bound in the wake of the global financial crisis of 2008, central banks responded to the persistent output gap and below-target inflation rates by introducing forward guidance on their official rates staying low for longer, a negative interest rate on bank reserves, credit and quantitative easing, and other unconventional measures. However, extreme liquidity and ultra-low interest rates also created

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[63]   Rachel and Smith (2017) make an attempt to quantify and forecast these explanatory factors at the global level.

higher leverage, spurred risk-taking in a hunt for yield and inflated asset prices, which altogether undermined the financial soundness of the economic recovery. In the words of Summers (2015, p.13): "it is not that secular stagnation means that the economy will always be stagnant. It is that the monetary policies that are necessary to counter secular stagnation will be able to achieve growth for a time, but at the price of considerable financial unsustainability".

He acknowledges in this respect that a monetary policy of ultra-low interest rates targeted at reviving aggregate demand and spurring higher inflation could make the economic upturn fragile because instead of promoting debt restructuring it is based on further growing financial imbalances. Moreover, the dosage of easy money may have to increase over time to maintain a constant effect of pulling forward future expenditures. These worrisome features could lay the foundations for another financial boom/bust cycle. Hence, in an economy afflicted by secular stagnation monetary policy is unable to keep inflation low and stable while simultaneously achieving full employment and maintaining financial stability (Bernanke, 2015).

6.3.4   *How to escape from a demand-driven secular stagnation?*

Summers considers it plausible that the evolving factors underlying the current low neutral real interest rates in advanced economies are persistent, complicating the task for central banks to set their monetary policy rates at an inflation-adjusted level that keeps the economy growing at full employment with stable inflation in line with the target. When the structural deficiency of aggregate demand is not resolved, the continuous drag on output growth keeps inflation very low and negatively affects the supply-side of the economy due to hysteresis effects characterised by a permanent decline in productivity growth. Some central banks stated that monetary policy would have to be even more accommodative than usual in order to break the persistent low inflation expectations and/or to limit the supply-side damage caused by hysteresis. For a durable recovery, a 'high-pressure economy' was warranted during which it was acceptable for inflation to run above the target of 2%.

Suggestions to accept higher inflation targets as a way to raise the nominal neutral interest rate and to create more room to cut monetary policy rates are generally resisted by central banks since they do not address the fundamental factors underlying the ex ante imbalance between saving and investment. As stated by Summers (2016), "[t]he core problem of secular stagnation is that the neutral real interest rate is too low. This rate, however, cannot be increased through monetary policy". The primary responsibility for resolving the monetary policy dilemma therefore lies with a more active role of the state. The government could take tax and regulatory measures to promote private investment. In addition, a large public investment programme financed by a higher budget deficit could support monetary policy in its counter-cyclical mandate. A more expansionary fiscal stance would reduce national savings, raise the neutral real interest rate and stimulate output growth.

Taking a critical look at some of his arguments, Summers appears to downplay the role of monetary policy in distorting the supply side of the economy before the crisis and to overemphasise the contribution of fiscal policy in reviving aggregate demand after the crisis. To start with, the secular

stagnation view ignores that monetary policy accommodated the pre-crisis credit boom and the expansion of the financial sector which interacted with rising asset prices and growing collateral values in shifting resources into low productivity sectors. The fact that underlying output growth was disappointing therefore may not reflect an overly tight monetary policy and a persistent demand deficiency but rather the misallocation of credit, capital and labour engineered by a financial boom that central banks decided to ignore (Borio et al., 2015). After the crisis, the unwinding of the misallocations took a long time, explaining at least in part the very slow recovery of productivity growth and the hysteresis effects. The ultra-low interest rates only prolonged this necessary supply-side adjustment as it blunted the incentives for financial institutions and borrowers to redress their overstretched balance sheets.

Furthermore, Summers takes the sustained low or negative level of government bond yields corrected for anticipated inflation to be the same as the expected real return on capital that underlies the natural interest rate. Gomme et al. (2015) raise serious doubts about this proposition, as in their calculations for the US the prospective capital returns are positive and show no downward trend. Marx et al. (2017) also find a broadly stable return on productive capital for the US, as well as for the euro area. The mistake is to equate 'risk-free' government bond rates with the 'risk-prone' return on capital in the production process. The post-crisis search for assets that appear like a safe store of value has put a special premium on high-rated government bonds and made investors willing to accept exceptionally low bond yields in a time of great uncertainty (as was also the case in the late 1930s).

Summers also ignores the concerns with a growing public sector raised by Hansen (1939), namely that carried too far it could be inflationary and undermine private incentives to adjust (see Section 6.3.1). The government could instead give more room to market mechanisms to make the economy resilient and flexible in its response to negative shocks. This appears as the most effective way to prevent a demand shortfall from becoming persistent and feeding hysteresis. Moreover, attention should be given to the nature of public investment and the allocation of resources. Summers argues that, with zero or sub-zero real interest rates, government debt service is very cheap. Any public investment project that yields a positive return would then be worth undertaking as it will generate enough direct revenue and/or multiplier effects to service the associated debt. "[P]ublic investment that would have been irrational at a high real interest rate, becomes rational at a lower rate" (Summers, 2015a, p. 64). Yet, undertaking public investment just for the reason that debt financing is cheap but without a proper cost-benefit analysis carries a risk of malinvestment and a distorted capital structure.

Teulings (2016) formalises secular stagnation as a situation whereby the equilibrium rate of return on capital (r) is persistently below the permanent growth rate of the economy (g). He prefers an increase in sovereign debt to resolve this dynamic inefficiency in a Walrasian framework in which all markets clear and expectations are rational: under the condition that $r \leq g$, the investment of savings in extra sovereign debt will bring future consumption forward in time and share risk between generations. A fiscal stimulus is also an efficient way to mitigate the impact of unexpected short-term fluctuations in

investment. Teulings concludes that to counter secular stagnation euro area governments should embrace higher public debt targets and follow the example of Japan. Hailing the experience of Japan is surprising. The many years of fiscal expansion and zero-interest rate policy have not proven effective in resolving its secular stagnation; the country was just left with much higher public debt. As pointed out by Leijonhufvud (2009), the true lesson of Japan's predicament of the 1990s is that "deficit spending will be absorbed into the financial sinkholes in private sector balance sheets and will not become effective until those holes have been filled." Moreover, the misallocation of resources associated with very cheap money may be one of the causes of hysteresis effects that also keep g low.

6.4 The secular decline of interest rates: the financial repression view

6.4.1 The origin of the financial repression view and forced saving

As discussed in Chapter 3, the financial repression theory argues that public policymakers may apply a variety of solutions to impose a discriminatory tax on the financial system to steer the flow of funds in the economy and, in particular, to ease government budget constraints. A favourite option is to impose artificially low administered bank and market interest rates so as to extract resources from savers and to redirect these to a high-debt government or politically supported private borrowers. This strategy also demands that financial transactions are restricted in order to prevent capital flight, creating an artificial 'home bias' for captive investors. An asymmetric monetary policy of allowing or inducing a rise in inflation makes financial repression truly effective, because it increases seigniorage income, lowers the real value of public debt and reduces the real interest rate on debt. The Austrian followers of Mises and Hayek focus in particular on the role of asymmetric monetary policy in accommodating bank lending or suppressing market interest rates and feeding unsustainable credit-driven business cycles. Their analysis offers a suitable theoretical framework for understanding the economic consequences of financial repression characterised by unnatural low interest rates.

During the 1930s, Hayek and Keynes debated the lessons to be learned from the Great Depression. As described by Skidelsky (2006), in the spring of 1929 Hayek condemned the 'easy money' policy initiated by the US Federal Reserve in mid-1927 (which greatly contrasted with the deliberate 'tight money' stance during the depression of 1920-1921 when it wanted to lean against the wind of high stock prices). The resulting credit creation had prolonged the economic boom for too long, distorted relative prices and caused overinvestment in securities and real estate and these excesses inevitably had to lead to a collapse. When the Fed changed course in January 1928 and rapidly raised the discount rate until August 1929 to counter the stock market boom, Keynes lamented this 'dear money' policy. Given plentiful savings and the absence of inflation, he saw the danger of underinvestment and the risk of an economic depression. The solution according to Keynes (1936) was for public policies to actively stabilise the business cycle. "For Hayek the depression was threatened by investment running ahead of saving; for Keynes by saving running ahead of investment" (Skidelsky, 2006, p.89). When the stock market indeed collapsed in the autumn of 1929 both Hayek and Keynes could claim to have predicted the following Great Depression, but using opposite reasoning.

Hayek (1931) concentrated on the relationship between interest rates and the capital structure of the economy and his analysis gave way to the credit-money theory of the business cycle, building on earlier work by other members of the Austrian School. From the point of view of the Austrians, banks operating in a developed financial system have a strong profit motive to provide loans at the going market interest rate. The rapid growth of bank loans creates additional deposit money and increases purchasing power in the economy; if not curbed by higher reserve requirements and a sufficient tightening of monetary policy, market interest rates will decline and fuel an unsustainable financial boom that unavoidably has to turn into a bust. Since households had not reduced their future spending plans the excessive creation of capital at some point would hit the economy's capacity ceiling, trigger price increases, force consumers to save and lead to a collapse of the financial sector. Central banks would provide ample liquidity to a squeezed banking sector and fix the monetary policy rate even further below the market-clearing level to get out of the slump. The Austrians regard this reaction as misguided, both because it prevents the cleaning up of the financial excesses and because it enables banks to go on extending too cheap loans for overconsumption and malinvestment, which forestalls the process of 'creative destruction' that according to Schumpeter (1942) is necessary to return to an efficient and dynamic production structure of the economy. Monetary policy thus sets the stage for a renewed financial boom/bust cycle in a credit-driven economy with savers earning a declining return on production capital and more and more hunting for yield in financial assets and real estate.

During the Great Depression, governments often used their influence over the central bank to keep interest rates at a low level and monetise a fiscal expansion aimed at reflating the economy. The public sector policies of credit controls and capping interest rates continued during and after the Second World War, until rising inflation, financial innovation and the opening up of protected capital markets forced governments to repeal the interest rate ceilings and to give central banks first more leeway and then independence in determining an appropriate monetary policy stance. After capital markets in the industrial world were liberalised in the 1980-1990s, the dampening influence of financial repression on the cost of government funding was hidden behind the veil of prudential policies applied to the domestic financial sector. Giving holdings of public debt a preferential regulatory treatment relative to private debt created an artificial 'preferred habitat' for investors.

The Austrian School further maintains that the monetary authorities have been prone to a low-interest-rate bias related to their increasing focus on the short-term interest rate as their main policy tool. The inflation targeting strategies adopted since the early 1990s either ignored exuberant credit growth and its interaction with asset prices or the monetary policy reaction to financial imbalances was asymmetric. On the one hand, central banks accommodated the rising leverage ratios as long as consumer price increases remained broadly in line with their respective inflation targets, output growth was satisfactory and rising asset values seemed to support higher private debt levels. On the other hand, they were quick to cut official interest rates in the face of financial market tensions and to reduce them further than usual in response to the disinflationary impact of unwinding financial imbalances.

As a consequence of this asymmetric monetary policy, banks had an incentive to reduce screening of borrowers and expand the outstanding amount of credit so as to increase their market share and cash positive valuation effects. The too low interest rates enabled them to forbear on non-performing loans, increase household mortgages and fund capital investments that at the natural level of interest rate would not have passed the hurdle rate of return required by the market. Companies also used the opportunity of the low cost of credit, higher collateral values and rising equity prices to refinance their capital stock and raise its profitability above the equilibrium level. In addition, borrowers looking for speculative gains took the opportunity of the low cost of debt to buy financial assets and real estate, thereby directing resources away from productive capital. Or cheap credit was used for leveraged buy-outs that drove the real rate of return of a private company loaded with debt far above the natural interest rate. While asset prices rose to unsustainable levels in response to ample liquidity, the supply side of the economy was weakened. The misallocation of credit in the face of too low interest rates resulted in overconsumption and malinvestment, which fuelled an unsustainable boom and had to lead to a bursting of the growing bubbles in a low-growth economy. Each downturn triggered a new cycle of central banks setting lower nominal and real interest rates to counter disinflation. By disregarding the rise in asset prices during the recovery, market interest rates were again kept too low to offer the return on capital that would attract sufficient investment demand to absorb the voluntary savings; instead, expanding credit financed another round of low-quality investments through enforced savings.

Frequently, regulatory and tax advantages were extended to private investments in politically favoured but mostly unproductive sectors such as residential property, helping to suppress the cost of debt for house purchase and push up the value of real estate. This motivated banks to make household mortgages available at too high loan-to-value ratios, in particular when house prices were rising, interest payments were tax deductible and the state guaranteed housing loans. For example, the unsustainable US housing boom after the turn of the century was not only financed by ample and relatively cheap domestic and foreign liquidity but also by federal government policies that actively supported the housing market and amplified the impact from favourable financing conditions (see for example Horwitz and Boettke, 2009; Calomiris and Haber, 2014).

6.4.2 *Financial repression, forced saving and the equilibrium (real) interest rate*

Fry (1997, p.76) illustrates the key elements of financial repression in a saving-investment diagram for an economy with a bank-based financial system and market entry and capital flow restrictions, showing how pervasive interest rate ceilings reduce the supply of loanable funds (S) and necessitate a rationing of the demand for loanable funds (D) according to non-price criteria. The 'voluntary savings' that are forthcoming at a particular output growth rate are a positive function of the real interest rate. These loanable funds also determine the feasible level of investment ($S_1=I_1$). Following the McKinnon-Shaw theory of 1973 (see Section 2.3), financial repression consists of the government imposing an administered nominal interest rate (i^a) that (combined with rising inflation) holds the real interest rate (r) below its equilibrium level.

The saving deposit rate may be fixed in real terms at (r^s), below the level corresponding with the equilibrium real rate (r^e) arising naturally in the loanable funds market, as in equation (6.2):

$$r^s < r^e \qquad\qquad (6.2)$$

The ceiling applied to deposit rates constrains the supply of savings relative to the savings that would be forthcoming (S_1) at the equilibrium real interest rate (r^e) in a competitive market (Figure 6.2). The corresponding lending rate (r^d) that clears the market in this situation is positioned well above the equilibrium rate (r^e), as in equation (6.3), and restricts investment demand to the available savings (S_2).

$$r^d > r^e \qquad\qquad (6.3)$$

The 'underinvestment' results in a lower stock of capital and in turn reduces potential output. Since the high cost of borrowing (r^d) ensures that only the most profitable projects are funded, their rate of return well exceeds the equilibrium rate (r^e) and supports an overly productive capital stock. The non-market spread between deposit and lending rates is pocketed by the banking system as long as it is protected from competition.

Figure 6.2 – Financial repression: administered interest rate ceilings
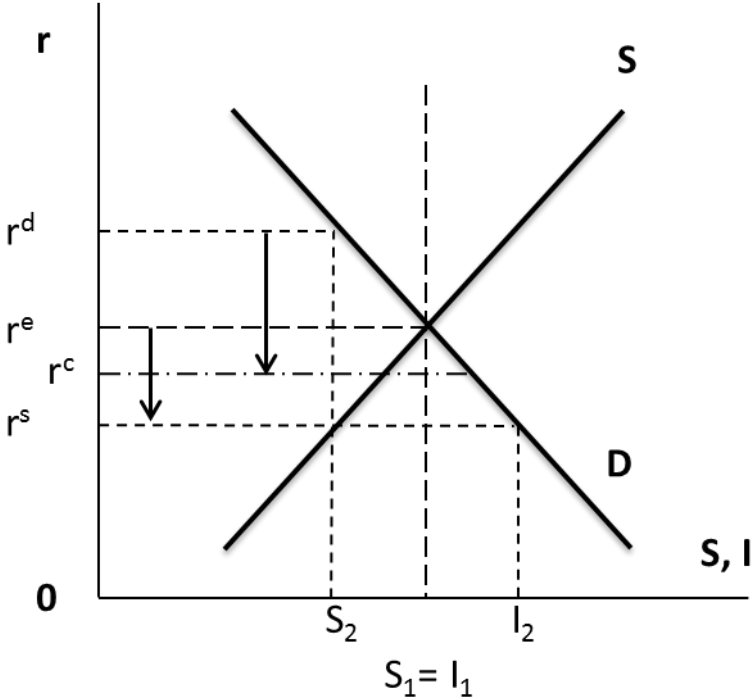
Note: S = real supply of loanable funds, reflecting propensity to save S; D = real demand for loanable funds, reflecting propensity to invest I; r = real interest rate; r^e = equilibrium real interest rate; r^s = administered real saving deposit rate; r^c = administered real loan rate; r^d = real market-clearing loan rate.

Adding a loan rate ceiling (r^c) to this set-up, placed below the equilibrium rate (r^e) but still above the ceiling rate on saving deposits (r^s), as in equation (6.4), means that loanable funds are subsidised and demand will exceed supply.

$$r^s < r^c < r^e \qquad\qquad (6.4)$$

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This disequilibrium produces credit rationing to selected borrowers on the basis of (additional) non-price criteria that do not (only) reflect the expected productivity of their planned investments but (also), for example, political interests. At this artificially low real loan rate (r^c) the selected borrowers that invest in projects expected to earn at least the equilibrium rate (r^e) enjoy an abnormally high profit margin. Yet, also investments with a lower expected return than the equilibrium rate, up to the subsided rate (r^c), become profitable and may pass the selection process. Since the non-market interest rate spread between deposit and lending rates is drastically reduced to favour the borrowers, banks may want to spend less on rigorously assessing the loan applications. As a consequence, the average efficiency of the selected investment projects is reduced. The distortions that the loan subsidies introduce will hurt the productivity of the capital stock. The drag on potential output may be aggravated when banks are furthermore obliged to divert scarce savings towards lending to the government at the below-market real interest rate.

Financial repression also arises when the central bank directly pegs the market yield on government securities (or fixes the yield curve) to ensure an affordable rate of interest for the public sector. Assuming that the monetary authority is successful in capping the nominal yield, a rise in inflation will then translate in the real interest rate falling below the equilibrium real rate (r^e). To contain any upward pressure on the fixed market yield, for example from higher expected inflation or productivity growth, the central bank will need to undertake countervailing purchases of government securities and allow for an increase in the reserves of the banking system, meaning that it can no longer control the monetary base. To some extent, the monetary effect of these additional reserves may be sterilised by the central bank requiring commercial banks to hold higher minimum reserves, which would be another act of financial repression, especially if the reserves are unremunerated. A similar injection of base money occurs when the central bank instead targets an increase in its balance sheet and buys government securities outright in the open market in order to both suppress (the term structure of) market interest rates and engage in indirect monetary financing of the state. As emphasised by the Austrian School, the supply of extra central bank liquidity will enable the banking sector to originate new loans at an artificially low lending rate and it sets a market process in motion that will lead to a boom followed by a bust, as described next.

The main features of the Austrian business cycle theory can be depicted in a similar diagram of the loanable funds market for investable resources, albeit in nominal terms (Figure 6.3). As described in detail by Garrison (2001), the willingness of households to supply loanable funds is determined by the rate of time preference at which they discount their future income, while the eagerness of producers to demand loanable funds is a negative function of the cost of capital for a given rate of output growth. The loanable funds market clears at the equilibrium or natural interest rate (i^e) as the equivalent of the intertemporal rate of return on capital which balances saving preferences with investment opportunities ($S_1=I_1$). Abstracting from inflation in this context allows focusing on how the central bank's injection of reserves changes the relative prices within the capital structure (given by the pattern of interest rates) that govern the intertemporal allocation of resources.

Commercial banks have the capacity to turn their free reserves held at the central bank into money simply by extending credit (ΔC) to their customers and placing the loan money in the borrowers' deposit accounts, thereby "lending money into existence" (Garrison, 2001, p.67) and bypassing the savings constraint. The increased supply of loanable funds forces a decline in the market interest rate to the level (i^f) below the equilibrium or natural rate (i^e) engineered by the central bank. The access to relatively cheap bank loans attracts extra investments at I_2, financed by 'forced saving' (equivalent to ΔC) because households did not increase their propensity to save and yet they are expected to postpone consumption to the future.[64] The central bank may accommodate the credit expansion or use its monetary policy tools to suppress the market interest rate (i^f) even further below the natural rate of interest (i^e) if it wants to give an additional boost to private credit or enable even cheaper government borrowing. Hence, financial repression becomes the transmission channel through which the monetary authority engineers forced savings (cf. Hoffmann and Schnabl, 2016).

Figure 6.3 – Forced savings: credit expansion with suppressed interest rate
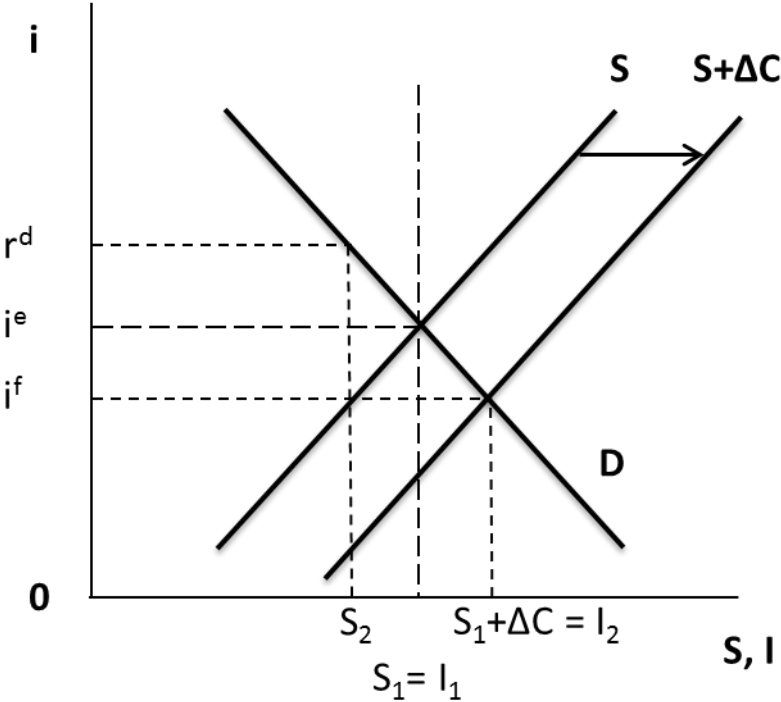
Note: S = supply of loanable funds, reflecting propensity to save S; D = demand for loanable funds, reflecting propensity to invest I; ΔC = change in outstanding bank credit or forced savings; i = nominal interest rate; i^e = equilibrium interest rate or natural rate; i^f = enforced interest rate; r^d = (real) market-clearing loan rate.

The intertemporal resource allocation and the resulting production structure are distorted and give rise to a booming economy characterised by excess consumption, overinvestment and a too large capital stock financed by excessive debt.[65] At the too low lending rate, the banking sector will moreover fund

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[64] Hayek (1932) discusses the history of the doctrine of 'forced saving', which goes back at least to the early 19th century.

[65] See Garrison (2001) for the complementary diagrams that link the intertemporal structure of production (depicted by the Hayek triangle) and the production possibilities frontier to the loanable funds diagram.

malinvestment projects with a relatively low expected return, a consequence also mentioned in the financial repression literature. The distortions introduced in the capital structure diminish the average efficiency of the economy, lower the possible return on capital and may drag down the natural interest rate. The intertemporal misallocation of resources cannot be sustained over time as long as households stick to their original saving preferences and their overconsumption (S_1-S_2). The conflict between producers and consumers over scarce resources will put upward pressure on the market rate and the emerging positive gap with the falling natural rate will tighten credit conditions and eventually turn the boom into bust.

Fry (1997) and Garrison (2001) both suggest how in equilibrium the credit rationing mechanism could cease to operate normally with the loanable funds market responding perversely to an upward drift in the (real) interest rate that in the end leads to a crisis. On the eve of the boom, the (real) interest rate will start to rise to the market-clearing level (r^d) consistent with the actual saving preferences, leading to distress borrowing by investors desperately looking for the complementary funds to finance their later stages of production or to refinance their maturing debt (at a higher interest rate, the demand schedule D will bend to the right). Faced with an increasing share of non-performing loans, banks may be willing to prioritise the urgent loan demand from distressed borrowers at the expense of lending to solvent firms. The general scramble for funds and the process of adverse selection will push up the (real) interest rate to a pathologically high level which will precipitate the crash.

6.4.3   *A new age of financial repression and forced saving*

Reinhart and Rogoff (2011) posit the revival of financial repression in the wake of the global financial crisis of 2008 and the ensuing Great Recession that pushed public debt-to-GDP ratios to high levels in most if not all advanced economies. The need to (re)finance a higher amount of public debt greatly increased the interest of governments in securing low borrowing costs despite in some cases much higher credit risk premia. As discussed later in this chapter, whether intended or not, central banks have given them a helping hand by entering into a substantial and sustained monetary easing which also mitigated the higher burden of public debt.

First, by rapidly cutting monetary policy rates to the zero or effective lower bound; second, by flooding the banking sector with very cheap liquidity that could also be invested in higher-yielding treasury securities, thereby creating an attractive carry trade opportunity; and third, by targeting lower sovereign bond yields further out the maturity spectrum to suppress longer-term real interest rates. The large-scale outright sovereign asset purchases that were effectuated to achieve the latter objective had a direct upward impact on the price of government bonds. The corresponding positive wealth effect implied a steady private sector demand for these debt instruments for the duration of the programmes. Even when the quantitative easing operations had tapered to an end, the stock of government bonds on central bank balance sheets was maintained for a long time by reinvesting the maturing issues. The removal of a substantial part of government debt from the capital market not only reduced public sector refinancing concerns but also implied that the corresponding interest payments would return as

seigniorage to the state as the beneficial owner of the central bank. While the aim was to relax financing conditions for the private sector, the exceptional monetary easing also created significant fiscal space and provided indirect monetary financing. The financial repression thesis sees these exceptional central bank actions as part of a broader political strategy of ensuring that the government is able to provide a significant fiscal stimulus to the economy and can still fund its elevated post-crisis debt at preferential low interest rates to keep the debt service burden down.

The Austrian School criticises in particular the prolonged nature of the monetary expansion that followed the global financial crisis, warning about its unintended but unavoidable consequences. Central banks flooded the economy at large with liquidity at longer than usual maturities and almost for free. Negative interest rates on excess bank reserves and unconventional monetary measures like quantitative easing depressed the term structure to a record-low level. While the initial monetary easing after the financial shock was justified to prevent a self-supporting downward spiral in aggregate demand, the persistence and further expansion of the monetary accommodation also translated into a range of adverse side-effects. These are visible in particular in distorted market prices leading to portfolio shifts higher up the risk ladder and a broad-based rise in asset prices, favouring borrowers over lenders while preventing the failure of unviable firms and the necessary reallocation of resources to profitable companies. The distortions in the capital structure get entrenched and deepen secular stagnation from the supply side (see Hoffmann and Schnabl, 2016). The credit-driven reflation only sows the seeds of a new phase of credit expansion, asset price inflation, overconsumption, malinvestment and excessive risk-taking that will turn the economic expansion into an unsustainable bubble economy that will unavoidably turn into a bust.

Considering a fiscal expansion, the Austrian School has tended to emphasise the crowding out effects in a situation of full capacity utilisation. A higher budget deficit financed in the capital market will increase the interest rate to attract the necessary supply of loanable funds from the private sector. While private savings increase, the effect of the government absorbing part of the loanable funds is to crowd out both private consumption and private investment (Garrison, 2001). But with idle resources in the economy, as in the Great Recession, there is no crowding out effect whereby resources get reallocated from the private to the public sector. A debt-financed fiscal stimulus to raise aggregate demand will not cause higher market interest rates until all resources are fully utilised. The additional government spending, however, still leads to distortions in the production structure, because the output of the public sector arises outside the market context and changes the composition of GDP (Ravier and Cachanosky, 2015). A government that steps into "the shoes which the feet of the entrepreneurs are too cold to occupy" (Keynes, 1930, p.335), rather than letting market forces reallocate excess resources within the private sector, creates public sector jobs that could be unsustainable in the longer run. As argued by Hayek, only the market discovery process is able to generate the information needed to determine where unused capital and labour can be put to their best use. Public sector interference in the market process is mostly seen as detrimental for longer-term growth and prosperity.

6.4.4 *How to secure a sustainable recovery after the crisis?*

The Austrian School and the financial repression doctrine firmly reject attempts of the monetary and fiscal authorities to reflate the economy by suppressing market forces and suspending structural reforms both in the private and public sectors. The focus of policymakers in a cyclical downturn should instead be on facilitating a rapid balance sheet repair and economic restructuring. This supply-side adjustment would correct the earlier misallocation of resources that contributes to hysteresis and restore market incentives that promote voluntary savings and productive investment as a sound basis for a recovery of output and employment to a sustainable path.

As commented by Leijonhufvud (2009), this position fully relies on the stabilising forces of the market process. The economic and financial system is assumed to be stable and 'creative destruction' will quickly bring about a new equilibrium. The risk of the system spinning out of control is disregarded. However, after a financial crash many agents are liquidity constrained, especially when they face a high burden of debt. A rapid fall in wages and prices could trigger a debt-deflation spiral that depresses the economy. Leijonhufvud therefore believes that the market may need support from the government in generating positive feedback mechanisms that guide the economy back to a stable path.

Hayek was aware of such concerns and reconsidered his earlier position on how to deal with a great depression. Originally, he was in favour of exploiting any economic downturn for breaking wage and price rigidities. This was necessary to ensure a quick deleveraging, restructuring and relative price adjustment and to start the recovery with a clean slate. Later he recognised the political constraints to such a cleansing process and made an exception for particularly severe depressions like that of the 1930s. For such seldom cases it was important for monetary policy to expand the money supply and provide sufficient liquidity to a collapsing banking sector in order to prevent a secondary depression (also referred to as a secondary deflation) that could lead to a self-reinforcing negative spiral (a remedy later also recommended by Milton Friedman). In addition, public works could provide a floor to aggregate spending, as there was no benefit in going through excessive deflation.

This remarkable turnaround shows some similarities with the view of Hansen (1939) as presented in Section 6.3.1 and suggests some room for reconciliation between the two positions: the first task after a financial crisis is to stabilise the economy. Afterwards, however, attempts by the government to protect fragile banks and loss-making firms from failing and/or by the central bank to speed up the recovery by maintaining an unnatural low interest rate for long can blunt exactly those market forces that should lead to a reallocation of resources consistent with the newly emerging natural interest rate (Garrison, 2012). Hence, the authorities should allow market processes to run their course in order to put the economy back on a sustainable growth path and in future refrain from interfering in intertemporal prices such as the interest rate if they want to prevent a new artificial boom.

By contrast, Turner (2015) proposes a number of public policies to more actively manage both the quantity and the mix of private debt in order to prevent a repetition of the earlier misallocation of savings and ensure that a credit expansion supports sustainable output growth. He sees benefits in

turning financial repression into a benevolent tool and suggests using higher interest rates to constrain credit booms while introducing an implicit tax on credit intermediation (or removing the tax deductibility of debt interest payments); in particular, directed credit could in his view be exploited as a quantitative tool for steering private savings to "the right sort of debt". Circumventing the market discovery process, however, is unlikely to lead to a better outcome in terms of potential growth.

6.5   Targeting interest rates and managing the yield curve for monetary policy

6.5.1   The economic rationale of pegging interest rates

Ceilings placed on interest rates have been justified for various economic reasons (for a discussion see Fry, 1997). Adam Smith and other liberal economists defended selective usurious practices, notably administered interest rate ceilings on consumer loans, as a public policy tool to reallocate savings from unproductive consumption to productive investment and to increase national prosperity. As Garrison (2001, p.97) put it: Adam Smith was "willing to trade a little bit of liberty for a little more growth". To be effective, however, the loanable funds market had to be segmented, i.e. subject to financial frictions; otherwise the cap on interest rates could be circumvented by shifting affected savings into unconstrained financial instruments, such as bonds and equity, which were just other loanable funds made up of savings in all its forms. This arbitrage effect led Garrison (2001) to argue that encompassing interest rate ceilings have no direct historical relevance.

Keynes (1936, p.351) observed that historically there had been a constant tendency for the rate of interest to rise above the full employment equilibrium level in economies prone to uncertainty. While certain hazards of economic life diminished the marginal efficiency of capital, other uncertainties increased the preference for liquidity. The excessive demand for liquidity destroyed the incentive to invest and reduced the feasible level of employment. Especially in an unsafe world, "it was almost inevitable that the rate of interest, unless it was curbed by every instrument at the disposal of society, would rise too high to permit of an adequate inducement to invest". The objective of preserving social stability could be another motivation for the state to enforce a 'fair' below-market interest rate on saving deposits and loans, even outside war times, using every available tool of public policy.

Tobin (1965) introduced a two-asset portfolio model in which household producers allocate their wealth between capital and money based on the relative returns on these assets. When the return on capital increases relative to that on money they will shift the composition of their portfolios towards capital. Hence, a higher rate of economic growth could also be achieved by pushing down the relative return on money, for example by taxing cash, placing a ceiling on bank deposit rates or creating inflation. With broader portfolios that also include securities the option of influencing the demand for financial assets other than money entered the picture and thereby the possibility of creating wealth effects by engineering a higher price of more risky portfolio instruments, including equity capital.

While Tobin highlighted the portfolio substitution between capital and money, McKinnon (1973) based his analysis of financial repression on the complementary nature of capital and money in

developing and emerging economies. Given the underdeveloped financial system with suppressed capital markets, savings first had to be accumulated into the banking sector before these could be intermediated towards borrowers for productive investments. Suppressing bank deposit rates was, in his view, counterproductive to this objective and the resulting shortage of 'voluntary savings' meant that investors were rationed. In addition, artificially low bank lending rates served to finance excess consumption, low-quality investment and pet projects of politicians with a detrimental effect on the productivity of capital. As a broad-based strategy to control the flow of funds in the economy, financial repression held back economic growth.[66] Following this reasoning, setting administered interest rates below their free market level could contribute to secular stagnation from the supply side.

The Austrian School also stresses the complementary nature of capital and money and arrives at the same result of suppressed interest rates leading to a distorted capital structure, yet from the opposite side of unrationed investment but forced savings to free up resources for producers. Moreover, they linked their analysis to a monetary theory of the business cycle. As long as the central bank maintained a bias towards too low interest rates and facilitated the corresponding unsustainable lending operations of rent-seeking banks, in the upward phase of the financial expansion and even more so in the downturn, the credit-driven business cycle continued with an ever-greater amplitude while the economy suffered from a trend decline in average productivity growth.

Taking a public finance view, governments may instruct the central bank to impose a pattern of affordable interest rates on the market to ensure cheap financing of both public and private spending and stimulate the economy. The need to conduct frequent open-market operations in order to stabilise these interest rates each time when investor preferences change or inflation expectations rise implies that the central bank gives up control over the money supply. The US Federal Reserve has pegged market interest rates under the influence of the US Treasury in a number of instances during the more than 100 years of its existence (see Box 6.1). The central banks of other advanced economies have in their history often applied similar interest rate restrictions, mostly together with credit controls.[67]

Referring to the US experience, Friedman (1968) pointed out that placing a cap on the market interest rate in order to keep it below the natural rate required ever-larger open market purchases, since the easy monetary conditions generated an economic expansion and upward pressure on the market interest rate. As inflation expectations spread throughout the economy, the nominal natural interest rate itself would rise and the central bank would have to undertake additional open-market operations in order to prevent the market interest rate from moving up as well and thus allow an acceleration of inflation. His analysis showed how a monetary policy that suppresses market interest rates prioritises the objective of full employment over price stability. Moreover, the natural interest rate was unknown and changed over time and the market rate was affected by many other variables than monetary policy.

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[66] Only in Japan and South Korea, where the government used its powers to direct scarce credit on favourable terms to a productive export sector did this strategy succeed for some time in supporting sustainable growth.

[67] Monnet (2016) reviews the conduct of monetary policy in Western Europe during the Bretton Woods period.

This made any central bank attempt to align the market rate with the natural rate futile because the outcome was undetermined. While unanticipated inflation could contribute to a temporary reduction in unemployment, a permanent trade-off between inflation and unemployment could not be achieved.

Friedman concluded that an interest rate peg was not a sustainable monetary policy option. He instead advocated central banks to adopt a steady rate of growth in a monetary aggregate under its control in order to provide full confidence in the stability of the average price level in the future. Monetary policy could not affect long-run output growth but it could make sure that the money supply followed a stable course and prevent it from being a major cause of economic instability. In addition, monetary policy could help to offset major economic disturbances from non-monetary sources when they offered a "clear and present danger" for stability. For example, allowing for a slower pace of money growth than otherwise could keep an independent secular exhilaration in check (Friedman, 1968, p. 14). Conversely, to get out of a severe economic depression like that in the 1930s it was important for the central bank to substantially increase the amount of bank reserves and the money supply (see also Nelson, 2013).

After the Bretton Woods exchange rate system had broken down and capital controls were gradually lifted several central banks experimented with quantitative monetary targets (often in combination with credit restrictions) to control inflation, albeit in many cases still acting in a discretionary manner to stimulate aggregate demand and employment. Further financial liberalisation and new financial instruments allowed market participants to arbitrage away from the targeted monetary aggregate, which undermined the stability of the long-term relationship between money and prices. The monetary authorities therefore soon returned to the practice of fine-tuning interest rates, focusing on the short-term part of the yield curve, which was still under their own discretionary control.

When it was necessary for monetary policy to respond to inflationary or disinflationary pressures, they changed their operational target for the short-term (overnight) interest rate and their communication on monetary policy intentions, thereby relying on the effectiveness of arbitrage to pass this change in the monetary stance on to interest rates further out the yield curve. To pin down the desired short-term interest rate some central banks carried out small-scale open-market operations in treasury bills; other central banks regularly conducted tender operations in which they auctioned the necessary liquidity at the fixed policy rate and secured it by demanding good collateral. The central bank balance sheet in both cases endogenously adjusted to the economy's structural liquidity needs in a passive manner.

Box 6.1 – Financial repression and interest rate targeting in the United States

The United States offers a few notable examples of how the US federal government exploited the Federal Reserve and used financial repression of interest rates to ease its own financing constraints.

McCulley and Pozsar (2012) distinguish four episodes in the US Federal Reserve's independence over monetary policy since its creation in 1913:

During the first episode, 1913-1951, the Federal Reserve was made to closely cooperate with the Treasury. Soon after it had been established, the Federal Reserve Act was amended in 1916 to allow the central bank to rediscount Treasury bonds at a preferential rate. The purpose was to keep the costs

of the country's debt financing for World War I low. During the Great Depression, President Roosevelt took office in March 1933 and made monetary policy subservient to the goals of the Administration. Congress effectively abolished the gold standard and initiated a reflationary fiscal policy coupled with monetary financing of budget deficits. With the short-term interest rate already standing near zero, the jump in inflation caused the real interest rate to fall from high levels to below zero (see Carlson, et al., 2008).

As an economic recovery took hold in spring 1935 and bond yields started to rise, the Federal Reserve was asked to buy Treasury bonds to stabilise interest rates. Two years later, the central bank undertook a programme of purchasing Treasury securities with the goal to stem the rise in bond yields that was hurting the value of Treasury bonds held by the banking industry. The Fed again intervened in Treasury bonds in September 1939 to calm down capital markets following the outbreak of World War II in Europe.

The March 1942 agreement between the Federal Reserve and the Treasury initiated a temporary interest rate control program with the aim to maintain "relatively stable prices and yields for government securities" and so to facilitate war financing. Wicker (1969) documents that the plan to place a ceiling on long-term interest rates supported by open market purchases and sales of government securities was initiated by the Fed so as to fend off Treasury demands that it should inject substantial excess reserves. During the discussions this developed into an agreement to fix a pattern of interest rates, starting with the Treasury bill rate, even though the Treasury was initially against "rigged rates". Once the interest rate pattern was established at a level thought to be "fair", the open-market operations necessary to maintain the yield curve seriously constrained the Fed's ability to use monetary policy for controlling inflation, also because the Fed was made to monetise the Treasury's debt and lost control over the money supply. Wicker (1969) concludes that the Fed interpreted its relationship with the Treasury as a partnership whereas their cooperation soon turned into Treasury domination of monetary policy.

Three-month Treasury bills were officially pegged at $^3/_8$%, slightly above the market rate, while the interest rates further along the yield curve were capped (without publicly announcing this) at $^7/_8$% for the one-year rate, 2% for the seven- to nine-year yield and at 2½% for the long-term Treasury yield (a level which was consistent with the yield that life insurance companies required for their solvency). Since investors shifted out of short-term into more attractive longer-term Treasury securities, the Fed was forced to build up a large portfolio of Treasury bills to maintain the peg. The upward impact on the reserve holdings of the banking system interfered on numerous occasions with its monetary policy objectives. Thanks to high investor demand, the cap on long-term yields did not become binding during 1942-1947 – even though the US government periodically issued war bonds – and the Fed did not have to intervene (see Chaurushiya and Kuttner, 2003).

Directly after the war, the Federal Reserve feared a major recession and therefore willingly accepted the monetary easing implied by the support programme for Treasury bonds (see IMF, 2012). During the summer of 1947, as inflation rose, the Fed was allowed to gradually raise the peg on Treasury bills to 1% and to increase the ceiling on one-year Treasury certificates to $1^1/_8$% by year-end in exchange for paying the Treasury 90% of the net earnings of the Federal Reserve Banks to offset its extra interest costs. For the first time the Fed had to enforce the long-term yield cap of 2½% by buying Treasury bonds for about one year. These purchases were initially financed by maturing bills so as to keep the Federal Reserve balance sheet largely unchanged. Later purchases involved a balance sheet expansion the impact of which was partly neutralised by an increase in required reserves. As the economy fell into a recession in late 1948 and bond yields declined, the Fed could terminate its bond market interventions. The outbreak of the Korean War in June 1950 forced the Fed to step-up its short-term securities purchases as the Treasury issued more of them while selling long-term bonds in order to minimise the impact on bank reserves as inflation picked up. This led to a public conflict between the Treasury demand for low interest rates to facilitate war finance and the Fed's desire for higher interest rates to stem the inflation caused by the war. By the end of 1950, the Fed also had to buy government bonds again in order to cap the rise in long-term yields (see Chaurushiya and Kuttner, 2003).

During the second episode, 1951-1978, the Fed rebuilt its independence over monetary policy while fiscal dominance continued to prevail. The interest-rate control programme was officially suspended

in April 1951 and formally abandoned in 1953 because the support for public debt management came to be seen as an "engine of inflation". At the same time, a restructuring of government debt was organised to reduce the losses for banks and insurers from higher long-term interest rates. Under certain conditions, bondholders could convert their marketable 2½% long-term Treasury bonds into 29-year non-marketable bonds with a 2¾% coupon (see Chaurushiya and Kuttner, 2003; Reinhart and Sbrancia, 2015). The 1951 Accord between the Treasury and the Federal Reserve minimised the monetisation of public debt while locking in the low level of bond yields.

During the following years the Federal Reserve confined its open-market operations normally to short-term securities, preferably in Treasury bills. The purpose was to influence the reserve position of the banking sector and to use the government securities market as an efficient medium for the transmission of monetary policy impulses. On two occasions of heightened interest rate uncertainty the Fed still provided some market assistance to support the financing of the Treasury; otherwise, the Fed argued against a monetary policy of pegging interest rates for the reason that this would conflict with its mandate of contributing to stable growth and high employment without inflation (see Young and Yager, 1960). When the Kennedy Administration initiated 'Operation Twist' in February 1961 with the aim of flattening the yield curve at the longer end as a way to boost the economy the Treasury and the Fed closely cooperated in its implementation. The Fed participated by purchasing Treasury notes and bonds trying to nudge longer-term interest rates lower; the Treasury reduced its issuance of notes and bonds and instead mainly issued short-term securities (see Swanson, 2011). Constraints under the Bretton Woods exchange rate system made it difficult at the time to cut the official interest rate.

The third episode started when the Humphrey-Hawkins Act of 1978 shifted the task to be the main steward of the economy from the Treasury to the Federal Reserve, giving it the present mandate "to promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates". This independent mandate enabled the Fed's monetary policy to dominate over fiscal policy and to set the federal funds target rate in line with a disinflationary course in the 1980s and 1990s while realising satisfactory output and employment growth. The apparent success of this Great Moderation also established the conditions for a trend decline in long-term interest rates. Garrison (2009), however, criticises the Fed for maintaining a bias towards too low short-term interest rates and for sowing the seeds of financial cycles by allowing rapid credit creation.

A fourth era has taken hold since 2000, when a more cooperative relationship between the US monetary and fiscal authorities has been apparent, in particular during recessions. McCulley and Pozsar (2012) argue that this can be seen in the Fed's open encouragement of fiscal stimulus during the economic downturn of 2001 and the 2009 Great Recession, the statements favouring an increase in the federal government's debt ceiling in 2011 and 2013, urging it also to limit the deficit-reducing impact of the 'fiscal cliff' (an automatic reversion of earlier tax cuts from 2013). The conduct of monetary policy by the Fed since the onset of the global financial crisis also directly facilitated Treasury financing, in particular the forward guidance of pegging the federal funds rate close to the zero lower bound, as well as its unconventional large-scale purchases in three rounds of Treasury bonds and government-guaranteed bonds (D'Amico et al., 2012), and a new Operation Twist of its own. At the same time, the Fed has been accused of overstepping its mandate by rescuing failing banks and taking extraordinary monetary policy measures during the crisis, leading to Republican calls for a Federal Reserve Transparency Act that would enable an audit of all its activities, including those like monetary policy that are currently exempted.

Finally, the Federal Reserve had to support the government not only through monetary policy but also via interventions in financial intermediation. From 1933 until 1986 Regulation Q prohibited commercial banks in the United States to pay interest on demand deposits and authorised the Fed to impose interest rate ceilings on time deposits and prescribing the different rates on time and savings deposits, which between 1966 and 1986 were set below the Treasury bill rate. This reduced the competition for funding among banks that in addition were faced with credit controls and high reserve requirements. Furthermore, until 1994 banks were not allowed to operate with branches in other states. This created artificial barriers for the free flow of funds inside the US, acting against investors looking for the highest return. However, this also triggered circumvention through e.g. money market funds. Although the official objectives were different, these repressive policies made investments in Treasury securities the most attractive option for both banks and the general public.

6.5.2 The core principles of monetary policy in open markets

As observed by Goodfriend (2007), by the late 1990s, a broad international consensus had emerged on the core principles of monetary policy in open capital markets.

First, it should be centred at achieving and maintaining inflation at a low and stable level consistent with price stability, commonly accepted to be an annual rate of around 2%, which would coincide with full capacity utilisation and was expected to support financial stability. Many central banks translated this in a monetary policy strategy of direct or flexible inflation targeting.[68]

Second, the conventional task of central banks was to direct the short-term interest rate towards the neutral interest rate of corresponding maturity that was consistent with the achievement of price stability in a situation of full capacity utilisation and to adjust the monetary stance in case of expected deviations from this objective. Money or credit growth no longer played any substantive role in these reaction functions, although they could be taken into account as indicators of future inflation risk.

Third, the operational framework of central banks typically involved money market operations aimed at managing the amount of reserves held by the banking system in order to bring the overnight market interest rate in line with their monetary policy rates. For the transmission of the monetary stance from the targeted short-term interest rate to longer-term interest rates and broader financing conditions they relied on the efficient markets hypothesis and the influence of central bank communication on the expectations of market participants.

Fourth, the common view was that central banks should have an independent mandate that allowed them to conduct monetary policy as necessary to achieve price stability. They should refrain from monetary financing or public debt management operations for fulfilling the state's budget needs. On their part, governments were expected to pursue sound fiscal policies subject to market discipline and legal provisions.

6.5.3 The short-term interest rate as an operational target for monetary policy

Central banks moved towards more transparent rule-based monetary policies centred at price stability during the 1980s and 1990s. Taylor (2016) observes that the task was to design central bank models with monetary policy rules that cushioned the economy from shocks while not causing their own shocks. Already in 1993 he recommended a feedback rule in which the monetary policy rate shadows the neutral or equilibrium interest rate and deviates from this benchmark whenever needed to restore a balanced economy, i.e. the output gap is closed and current inflation is in line with the target. When this so-called Taylor Rule was used in practice, so he finds, economic performance improved. However, with an inflation gap in the feedback rule, there is also a risk that a surge in productivity growth which leads to a supply-induced disinflation is interpreted as a deflationary force that must be

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[68] Central banks in continental Europe generally adopted an exchange rate target anchored onto the Deutsche mark given the high credibility and success of the Deutsche Bundesbank in maintaining price stability in Germany based on its monetary targeting strategy. For an appraisal of the evolution of monetary policy strategies in Europe see Houben (2000).

countered by lowering the policy rate. Selgin et al. (2015) characterise such a response as 'naive' inflation targeting and show that in this situation the central bank should allow the real interest rate to rise; if not, too easy monetary policy will trigger asset price inflation that goes unnoticed in the standard Taylor Rule. Therefore, they prefer a feedback rule based on nominal GDP targeting. Alternatively, Fahr et al. (2013) and Juselius et al. (2017) propose that the Taylor Rule is extended with a measure of the credit gap or debt-service gap to bring financial imbalances into the picture.

Considering the experience of the US during the Great Moderation, starting in the mid-1980s, Garrison (2009, p.187) describes the monetary policy of the US Federal Reserve as a 'learning by doing' strategy of looking for the appropriate level of the monetary policy rate after monetary targeting had failed. Ex post it appeared that the monetary policy reaction function of the Fed could be described by a Taylor Rule focused on realising a predetermined neutral real interest rate of 2%. Yet, the true variable that secured an intertemporal economic equilibrium was the natural real interest rate as determined in a market discovery process. Targeting the federal funds rate at keeping the macroeconomy in line with the neutral rate in fact distorted free market borrowing and lending activity and prevented the underlying natural rate to emerge. Since the natural rate is also subject to variation over time, central banks using it in their monetary policy reaction functions were chasing a moving target. The Fed would most likely direct the federal funds rate to the wrong level, usually too low, given a bias towards neglecting credit growth and asset price inflation in the Taylor Rule. The aggressive monetary easing after the 1987 stock market crash therefore contributed to the making of the recession in the early 1990s, a story that repeated itself in ever-larger new boom-bust cycles.

During the second half of the 1990s and the early 2000s, the US experienced a burst of innovation that led to a surge in total factor productivity growth. Selgin et al. (2015) find that the Federal Reserve initially accompanied this supply-driven decline in inflation with a tighter monetary policy but changed course after the bursting of the IT stock market bubble. Around the same time, a flood of savings from emerging market economies entered the global economy, placing downward pressure on inflation and the natural interest rate in advanced economies. This additional liquidity might have encouraged investors to take more risk, search for higher yields and thereby depress the rates on low-risk securities even further. When it was lowering the monetary policy rate during this episode, so Garrison (2009, p.195), "it would have been difficult for the Federal Reserve to know whether it was following the natural rate down or feeding a boom". The federal governments' housing policy combined with financial innovations put further oil on the monetary fire and virtually destroyed the viability of short-term interest rate targeting as a monetary policy rule.

After June 2003, when the Federal Reserve had cut the federal funds target rate to a low of 1%, it felt constrained by the zero lower bound. A further interest rate reduction to address deflation risks was seen as potentially causing adverse side-effects for money market funds and the functioning of the market for Treasury bills. For the first time, it introduced forward guidance about the likely evolution of future short-term interest rates in its monetary policy communication. The Federal Reserve's

forward guidance evolved from a first statement that its policy accommodation could be maintained for a considerable period (August 2003), through saying that it could be patient in removing it (January 2004), to mentioning that it could be removed at a pace that was likely to be measured (May 2004). A series of decisions then increased the federal funds target rate step by step (from June 2004 to June 2006) conditional on changes in economic prospects that affected price stability. Carlson et al. (2008) observe that this forward guidance was successful in holding down and lowering the expected future path of short-term interest rates and hence longer-term yields for some time. Brzoza-Brzezina and Kotłowski (2014) find that, in contrast to the three-month interest rate, the longer end of the yield curve was below their estimate of the natural yield curve in 2003-2004, indicating that monetary conditions remained accommodative and only became restrictive in 2006-2007.

Taylor (2016) observes that, after the turn of the century, the Federal Reserve deviated from rules-based monetary policy and kept its target rate "too low for too long", creating incentives for other central banks to follow suit. A similar asymmetric reaction of monetary policy to the different stages of the financial cycle was observed in the core of advanced economies. Given open capital markets, their collective bias towards an easy monetary policy had implications for global financial conditions. Central banks in the rest of the world wanted to insulate their economies from undesired foreign capital inflows but were reluctant to accept floating exchange rates as a shock absorber and therefore also kept their interest rates low. After the year 2000, monetary policy rates at the global level have thus been systematically lower than the path indicated by standard Taylor Rules (see Figure 6.4), leading to too much risk-taking and a build-up of excessive debt. Compared to the Taylor Rule, policy rates were kept much too low also after the Great Recession of 2009 (see Shin, 2016).[69]

This experience of asymmetric monetary policies suggests that the pre-crisis DSGE models used by many central banks for monetary policy forecasting and simulation had a number of shortcomings. A large output drop as seen in the Great Recession was calculated to be a highly unlikely tail event. This stands in sharp contrast with the Austrian School, which early on associated too low interest rates, strong credit growth and the attendant rapid expansion of the financial sector as a strong signal of overconsumption, malinvestment and a distorted production structure. Since consumers had not freed up resources, it was inevitable that the debt-driven boom would turn into a bubble and lead to a collapse in output. Bezemer (2014) and Turner (2015) also argue that the neglect of credit growth fuelled unproductive activities and asset price inflation and explains why nobody saw the financial crisis coming.[70] Bezemer et al. (2016) examine different categories of bank credit since 1990 for 46

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[69] A critique of the standard Taylor Rule depicted in Figure 6.4 is that monetary policy is forward-looking and should therefore be based on the expected inflation rate and output gap instead of their current period values. See for example Gorter et al. (2008).

[70] According to White (2016, p.190), "all the relevant policy makers were seduced into inaction by a set of comforting beliefs", leading them to disregard the excessive risk-taking by credit intermediaries and their borrowers: central banks believed that inflation was under control and that if there was a bust in asset prices they could quickly clean up afterwards, regulators thought that if all financial institutions were healthy the system as a whole would also be stable, and governments spent buoyant tax revenues instead of building a fiscal buffer for rainy days.

economies. They find that bank credit growth was mostly accounted for by household mortgages for real estate as well as credit for other asset markets. These categories of bank lending are found to have a negative relationship with output growth, in contrast to credit extended to non-financial firms.

Figure 6.4 – Global monetary policy rates compared to Taylor Rules

Source: Shin (2016).

Note: The Taylor Rule in Figure 6.4 takes the following form:

$$i = r * + \pi * + 1.5 \, (\pi - \pi *) + 0.5 \, y$$

where i is the nominal monetary policy rate, r* is the long-run or equilibrium real rate of interest set equal to the trend real output growth rate, π* is the central bank's inflation objective or otherwise the sample average or trend, π is the current period inflation rate, and y is the current period output gap. Ranges are based on a variety of inflation/output gap combinations. The global weighted average of advanced and emerging market economies is calculated using 2005 GDP and PPP exchange rates.

Central banks have since amended their DSGE models to the changing financial environment; for example, by incorporating financial frictions, financial accelerators, a banking sector, or the possibility of default (see Beyer et al., 2017). Whereas this may improve their forecasting performance, Taylor (2016) regards a monetary policy bias towards low interest rates as the main culprit of forecast mistakes. He recommends central banks to use his Taylor Rule again as a guidepost, as they implicitly did during the Great Moderation. Yet, his advice implies that monetary policymakers will continue to follow a political definition of the neutral interest rate which will deviate from the natural rate emerging in a free market economy.

6.6 Central bank interventions in public and private debt markets

6.6.1 A new style of central banking

Following the global financial crisis of 2008, a new monetary policy approach has emerged. The first traditional reaction of central banks was to rapidly cut their monetary policy rates (close) to zero,

passively accommodate the banking sector's heightened demand for reserves to resolve liquidity freezes in the interbank market and directly intervene in a broad range of financial markets to repair monetary transmission channels. The next question they faced was: how to further ease financing conditions to counteract a credit crunch and secular stagnation? Central banks feared that pushing their monetary policy rate well below zero, such that corrected for below-target inflation it would stand sufficiently below the neutral real interest rate, could trigger a massive flight into paper currency[71] and create unsurmountable difficulties for the financial system. As a consequence of this 'monetary paralysis' to enter into an effective negative interest rate policy (Rogoff, 2017), the shortfall in aggregate demand had to be addressed with other monetary tools, except for direct monetary financing of government spending.

Keynes (1930) had already dealt with the question of how to respond to a persistent slump that defies all normal methods of control. He recommended the central bank in this situation – in addition to lowering the short-term interest rate to a very low figure – to "change the abundance of credit for affecting the fringe of unsatisfied borrowers" (p.325, i.e. credit easing), to purchase securities in "open-market operations to the point of saturation" (p.331, i.e. quantitative easing), and "to produce a general belief in the long continuance of a very low rate of short-term interest" (p.346, i.e. forward guidance), all with the aim to bring long-term interest rates and the cost of funding sufficiently down to stimulate investment.

Central banks closely followed his advice and shifted attention to forward guidance, medium-term credit operations and the direct management of the yield curve to achieve a further relaxation of the monetary stance. To escape from the 'secular stagnation trap' in the present time, they took a deep dive in the monetary policy toolbox, employing conventional tools in an unusual manner as well as unconventional monetary instruments in an experimental way. Sooner or later, all major central banks aggressively pursued a quantitative and/or qualitative target for expanding the size and changing the composition of their balance sheet, notably through large-scale public and private sector asset purchases, the continuous reinvestment of maturing assets, and a mixture of implicit subsidies and taxes in credit operations with the banking sector. As a result, the balance sheet became an operational tool of monetary policy and increased dramatically in size for all major central banks (Figure 6.5).[72] The extraordinary monetary policy measures were generally accompanied by a more explicit communication strategy to signal the intention of maintaining a very accommodative monetary stance – both in terms of interest rates and asset purchases – over a longer horizon than usual, just as Keynes had recommended.

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[71] Since exercising this cash option to earn at least a zero nominal return will entail some costs for both households and firms, the effective lower bound on central bank interest rates is slightly lower than zero.

[72] The literature tends to use 'quantitative easing' for any programme of large-scale asset purchases that leads to a rapid expansion of the central bank balance sheet. However, the objective associated with this monetary easing can be different. The Bank of Japan targeted a particular growth rate of the monetary base. Others like the US Federal Reserve and the ECB actively sought to relax credit conditions across financial markets and revive malfunctioning credit markets. For the latter case 'credit easing' appears a more appropriate formulation for large-scale asset purchases (see ECB, 2015).

Figure 6.5 – Balance sheet size of major central banks, 2007-2016

(index of total assets, January 2007 = 100)
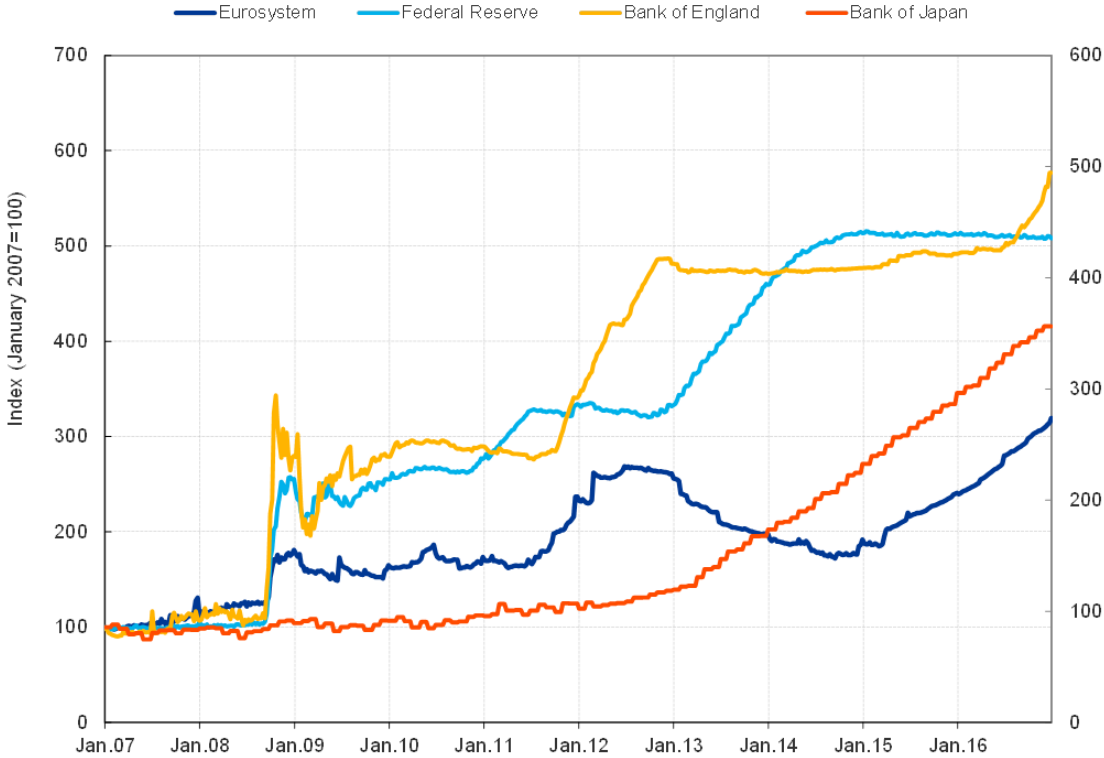
Sources: ECB, US Federal Reserve, Bank of England, Bank of Japan. Latest observation: December 2016.

Note: The balance sheet of the Bank of England is approximated after 24 September 2014 since the Bank only discloses 90% of its consolidated balance sheet after this date.

This new-style central banking sought to expand the direct influence of monetary policy beyond the traditional short-term interest rate, using unconventional instruments to reach out far along the yield curve and across financial asset prices while injecting an increasing amount of risk-free reserves. The objective of this monetary policy activism was to provide banks with ample overnight liquidity, stabilise disrupted financial markets, reduce longer-term interest rates, create wealth effects and relax financing conditions for the private sector as usual.

Several academics have tried to capture the changes in the short-term interest rate and the additional impact of unconventional measures and forward guidance on the monetary stance in a single variable, the so-called shadow interest rate. This hypothetical variable stands for the short-term rate that would prevail in a situation when economic agents cannot turn their savings into paper currency at the zero lower bound. Applying this assumption allows constructed interest rates to fall into negative territory, as if there was no zero bound constraint. The estimates by Krippner (2016) of the shadow short-term rates for the major advanced economies visualise the money market impact of unconventional monetary policies at the zero lower bound, which for the Bank of Japan started around the turn of the century and for the other three central banks in the wake of the global financial crisis (see Figure 6.6).

Figure 6.6 – The shadow short-term interest rate in major advanced economies, 1995-2016

(monthly averages of daily data in percent)
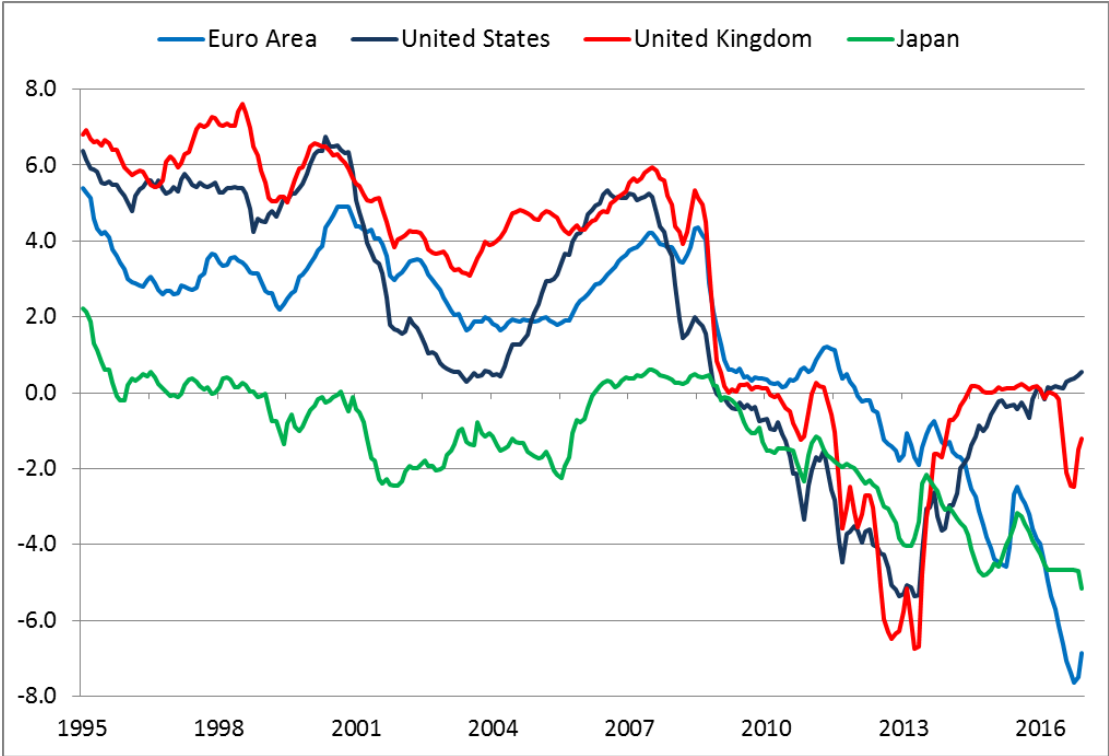
Source: Krippner (2016).

The conduct of monetary policy between 2008 and 2017 was highly unconventional by the Western standard of the previous decades and marked a 'new era of central banking' (Santor and Suchanek, 2016). For all major central banks the novel and evolving dimensions of the monetary policy framework entailed "a fair amount of policy experimentation" (Woodford, 2012, p.2) – although in fact it amounted to rediscovering central bank tools known from the past. According to Goodfriend (2000) and Bernanke (2002), quantitative monetary policy was not 'logically harder' to implement than traditional interest rate policy. The shift in operational target from the short-term interest rate to the yield curve, which can be affected by additional tools, mimicked the practice of pegging various interest rates in the decades following the Great Depression. Draghi (2016) and Gagnon (2016) also describe the use of unconventional measures as a straightforward extension of conventional monetary policy aimed at lowering interest rates, following the same logic of making financial conditions more expansionary relative to the neutral interest rate. Brzoza-Brzezina and Kotłowski (2014) point out that in these circumstances the monetary stance should be measured by the gap between the whole term structure of interest rates and the natural (or rather neutral) yield curve.

At the zero lower bound, monetary policymakers concerned about their credibility were adamant to show that there were plenty alternative tools to achieve the 'divine coincidence' of full employment and price stability (Rogoff, 2017). Yet, unconventional monetary policy operations could also face what Keynes (1930, p.334) called "limiting factors", such as missing international cooperation, a lack

of ammunition to go on buying securities, and the risk of serious financial losses when selling them again. Yates (2004) also observes that something must be 'harder' about quantitative monetary policy; otherwise central banks would have applied it more frequently in the past, also away from the zero lower bound. While it is easy to start, the exit strategy from quantitative easing appears more complicated and central bank balance sheets will remain bloated for many years.

Maintaining low-for-long interest rates also raises potential concerns about the functioning of financial markets, the profitability of banks, the health of financial institutions, the incentives for excessive risk-taking and other unintended adverse side-effects (see also van Riet, 2017c). For example, the risk management strategies of institutional investors may trigger an endogenous feedback loop between the decline in risk-free interest rates and the hunt for duration. When interest rates fall, typically, the negative duration gap between their fixed-term obligations and long-term assets will widen. Prudence suggests that they should try to close the gap by adding more long-dated government bonds to their portfolios. However, in the aggregate, this reaction only pushes long-term interest rates further down and undermines the solvency of institutional investors (see Domanski et al., 2017).

Central banks also ventured ever-more deeply in fields that were traditionally considered to be the prerogative of fiscal policy, such as public debt operations, credit allocation, and income and wealth distribution, while assuming substantial risks on their balance sheet on behalf of taxpayers (Blinder et al., 2017). Although the focus of large-scale asset purchases was on 'safe' (central) government bonds or government-guaranteed debt securities, Woodford (2012) suggested that the central bank could also buy private rather than public sector assets and activate a direct transmission channel to influence private wealth and spending decisions. This type of monetary policy action involves favouring some private issuers over others and is normally seen as the preserve of fiscal policy.

Actively expanding the balance sheet and changing its composition has altogether much wider political implications than conventional monetary policy and lender of last resort operations in an emergency. The fiscal and quasi-fiscal character of large balance sheet operations raises questions of democratic legitimacy and accountability. Orphanides (2016) believes that as a result public trust in monetary policy might become more tentative. Growing dissatisfaction with the greater reach of central banks and the larger distributional implications could undermine public support for their statutory independence (de Haan et al., 2017).

Against this background, new-style central banking put the relationship with fiscal policies to the test. Woodford (2012) therefore calls for a close coordination between the monetary and fiscal authorities. To clarify the borderline between monetary versus fiscal responsibilities, the treasury in some countries (for example, the United Kingdom and the Netherlands) promised to indemnify the central bank against potential capital losses related to their growing portfolio of securities (as recommended by Buiter, 2014). Elsewhere, the central banks mainly tightened their risk management procedures and/or reduced their dividend payments to the state so as to build up extra financial buffers against the cost of higher future net interest payments, valuation losses and the risk of default on security

holdings. Avoiding negative equity was important for these central banks to preserve their financial independence, operational autonomy and the public perception of a strong monetary capacity.

6.6.2   *The Bank of Japan leading the way*

The Bank of Japan was already in the 1990s confronted with a large financial crisis followed by deflation and had to look for additional operational tools after having cut its monetary policy rate to zero in February 1999 in combination with forward guidance on future interest rates. As from March 2001, it started with quantitative easing operations in the form of outright purchases of Japanese government bonds in exchange for central bank money (for an overview, see Shirakawa, 2013). The new operational target became a strong expansion of the monetary base. The large injection of central bank liquidity was in line with Milton Friedman's recommendation to not only meet but to exceed the higher demand from the banking sector for reserves that emerges in a financial crisis (see Nelson, 2013). The initial concern on the part of the Bank of Japan of taking on too much interest-rate risk on its balance sheet was waved away by Bernanke (2003). He argued that it was important for the Bank of Japan to rapidly expand its balance sheet to fight deflation and it could always agree with the ministry of finance to swap the long-term government bonds that it purchased for government securities with floating interest rates. Additional credit easing in the form of outright purchases of risky private assets (stocks held by financial institutions, asset-backed securities and commercial paper) later complemented this quantitative easing. Moreover, the Japanese government initiated a strong fiscal expansion. Given the long delays in bank and corporate restructuring, the central bank's balance sheet operations were unsuccessful in engineering higher output growth and positive inflation in Japan, although in terms of GDP per capita economic performance was more satisfactory.

After the global financial crisis of 2008, the Bank of Japan started a second wave of comprehensive monetary easing measures in October 2010 involving purchases of exchange-traded funds (ETFs) and securities issued by Japanese real estate investment trusts. This was followed by a third wave in April 2013, after the price stability target had been raised from 1% to 2%. The Bank of Japan launched quantitative and qualitative easing operations to double the monetary base by actively expanding its balance sheet and changing its composition and started purchasing record-large amounts of private sector and in particular public sector securities in exchange for central bank liquidity. Given its dominant market role and strong influence over asset price formation financial analysts compared the Bank of Japan to a 'whale in the pond' (see Iwata et al., 2016).

Since other advanced economies now faced similar challenges as Japan, the other major central banks followed the early 2000s example of the Bank of Japan in actively expanding their balance sheets – notably with government bonds or government-guaranteed securities – and pumping a large amount of central bank liquidity into the economy (see Figure 6.5). However, the Bank of Japan was the only one among its peers to actively buy securities on the stock exchange, concentrated on the ETF market, with the intention of supporting financial asset prices and reducing the cost of capital of domestic firms. Through its portfolio of index-linked ETFs the Bank of Japan became the largest indirect

shareholder of many Japanese firms listed on the three stock exchanges. By late 2016, it was the largest shareholder for a quarter of the Nikkei 225 companies (Iwata et al., 2016). While exercising substantial control over share prices, the central bank thus also exposed itself to sharp stock price declines in the exit phase even though it started to sell some of its other equities.

After many years of a zero interest rate policy, the Bank of Japan broke through the zero lower bound in January 2016. A three-tier system of interest rates (0.1%, 0% and -0.1%) was applied to the banking system's current account balance with the central bank, with the negative rate only affecting marginal increases so as to lower the money market rate but mitigate the impact on bank profits. While the ECB had already introduced a negative remuneration for its deposit facility in June 2014, the US Federal Reserve and the Bank of England were more cautious in this regard, fearing the negative consequences of negative policy rates for the functioning of financial markets in general and the vulnerability of money market funds in particular.

After the summer of 2016, following a review of its monetary policy framework, the Bank of Japan again broke new ground as it extended its quantitative and qualitative monetary easing framework with yield curve control. In addition, it committed to overshooting its price stability target of 2% and to stabilise it there – without indicating at what level and for how long – in an effort to break backward-looking inflation expectations based on low or negative inflation realisations.[73] The new intermediate objective of directly targeting a desired term structure of interest rates meant that it would henceforth adjust the pace of securities purchases as necessary to peg the 10-year sovereign bond yield at around zero, also in order to maintain a slightly positive interest rate margin relative to the negative money market rate in the interest of the banking sector. The tighter this intermediate policy target was followed, the more the Bank of Japan gave up control over the size of its balance sheet and the monetary base, although in practice it managed to taper the volume of asset purchases. The objective was to absorb not only a very large amount of public debt but also most if not all of the interest rate volatility in the sovereign bond market. The upshot is that the Japanese government could in future undertake any fiscal stimulus leading to higher public debt without fear for triggering higher bond yields. One observer referred to this new framework as "a wartime monetary policy in peace times", because it was similar to the US Federal Reserve's objective of fixing the yield curve during 1942-1951 under instigation of the Treasury (see Box 6.1).

6.6.3   *Managing the term structure of government bond yields*

As explained in this sub-section, the successful transmission of a quantitative monetary stimulus to output and inflation is dependent on its ability to exploit financial frictions in the economy, such as the presence of arbitrage constraints, preferred habitat investors and segmented bond markets, as reflected

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[73]   When the US Federal Reserve was scaling back its monetary stimulus in 2016-2017, it indicated that a gradual path of rising interest rates was appropriate, even if inflation would run above its symmetric target of 2%. A relatively accommodative monetary stance during the recovery phase, so it argued, could allow for a high-pressure economy to reverse hysteresis effects, while keeping an eye on the risks for both financial stability and price stability.

in term premia in interest rates. The central bank must reduce the overall amount of safety, liquidity and duration in the economy and exchange its risk-free overnight reserves for relatively less safe or even risky assets of lower liquidity and longer duration.[74] The net injection of safety and liquidity into the economy while extracting net duration directly compresses term premia in longer-term interest rates. This quantitative easing in turn triggers a process of portfolio rebalancing with spill-over effects across many asset markets, as a result of which it lowers as well as flattens the forward yield curve, contributes to a deprecation of the exchange rate, generates higher stock prices, creates positive wealth effects and thereby eases general financing conditions and increases the demand for financial and real assets. This monetary policy operation also signals the intention to maintain an accommodative stance.

For a certain class of environments, outright transactions by the central bank in sovereign bond markets to alter the composition or riskiness of private portfolios are ineffective in changing bond prices and affecting the economy. Sophisticated agents would take an encompassing view; they would understand that their ultimate exposure to changes in public spending and taxes remained unchanged and was simply the mirror image of the initiated change in the consolidated public sector portfolio of the government and the central bank. This neutrality proposition, formulated by Wallace (1981), rests on several strict assumptions, in particular: the existence of complete and competitive markets, the absence of financial frictions or market segmentation, central bank losses are offset by private sector taxes, private agents have perfect foresight and they value assets solely for their pecuniary yields and ignore any non-pecuniary advantages (see Woodford, 2012). Since these assumptions are unlikely to apply in reality, for example due to regulatory requirements, the neutrality proposition fails and the central bank's outright open-market operations in risk-prone securities that affect private sector portfolios will have a measurable impact on asset prices and the economy.

Government bond yields and the term structure of interest rates are commonly modelled using the expectations theory. The strong form of this theory assumes complete and perfectly functioning financial markets with forward-looking private agents who are neutral to taking risk and value all assets equally. According to the strong form of this theory the fixed interest rate on a sovereign bond of a particular country and currency denomination is determined by the average of current and expected future short-term interest rates summed over the remaining life of the bond, i.e. the expected return from rolling over investments in a sequence of 'risk free' short-term bonds over its horizon. Assuming frictionless financial markets, there are no barriers to executing trades and, hence, arbitrage ensures that the economic information underlying these short-term interest rates is incorporated in the bond prices for all maturities, which establishes an expectations-based sovereign yield curve.

A weaker form of the expectations hypothesis allows for adding a constant wedge between the prevailing bond yield for each maturity and that implied by the anticipated path of short-term interest rates. With a normally upward sloping yield curve the wedge is positive. This constant term premium

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[74] See Cour-Thimann and Winkler (2016) on the role of the central bank 'balance sheet of last resort' in absorbing financial risks and reducing risk exposures in the balance sheets of other economic sectors.

could reflect the given risk of falling bond prices over the fixed term to maturity in a stable macroeconomic environment where the expectations of market operators are well anchored.

These considerations lead to the basic specification (6.5) of the two determinants of the nominal yield on a government bond of country i at time t denoted by $R_{i,t}$ as comprising the average of current and expected future short-term interest rates $S_{i,t}$ over the residual maturity (m) of the bond and the constant term premium (ρ_i) related to that bond (see for example Joyce et al, 2011):

$$R_{i,t} = \left(\frac{1}{m}\right) \sum_{t=1}^{m} S_{i,t} + \rho_i \qquad (6.5)$$

Assuming the presence of financial frictions, the expectations-based model (1) must be extended by a variable instead of a constant term premium denoted by $\rho_{i,t}$ to account for time-varying constraints on the adjustment of agents' portfolios to economic shocks, as shown in equation (6.6):

$$R_{i,t} = \left(\frac{1}{m}\right) \sum_{t=1}^{m} S_{i,t} + \rho_{i,t} \qquad (6.6)$$

These financial frictions may arise in particular from the heterogeneity of investors in terms of their preferences and/or their arbitrage abilities, including their (home) country bias. The term structure of interest rates will then result from the demand and supply of bonds with various residual maturities whereby the interaction between the different types of investors leads to the clearing of the government bond market(s) in equilibrium (as explained by Vayanos and Vila, 2009).

The first financial friction can be connected to a class of investors having a strong preference for national government bonds with specific characteristics (so-called *preferred habitats*). Their bias may be explained by the unique conveniences that these securities offer, notably in terms of their maturity and/or their security.

As regards maturity, many commercial banks, asset managers, pension funds and life insurance companies are typical clients for government bonds of a specific duration. They may value the stable long-term cash flows of these fixed-income assets to match their future spending needs, or they may rely on long-term government securities to match the long duration of their fixed-term liabilities (Vayanos and Vila, 2009; Domanski et al., 2017). Furthermore, the government may itself have a preference for offering longer-term bonds with a fixed coupon as it seeks to reduce interest-rate risk when it has to roll over its debt. Such a public debt management strategy will 'lock' a growing proportion of investors into longer-term bonds which they may wish to hold to maturity.

Considering the security aspect, many of these buy-and-hold investors also value the high degree of liquidity and safety of treasury bonds compared with corporate bonds, expecting that reflecting these characteristics they will rise in value in turbulent times and offset falling market prices of their private sector assets. Some institutional funds have a legal mandate that allows them to invest only in (high-rated) government bonds for prudential purposes. Similarly, foreign central banks and sovereign wealth funds wishing to diversify their reserves internationally are often only interested in government bonds issued by a country deemed to be safe, taking account of expected exchange rate volatility.

The portfolio bias of investors towards government bonds may also reflect a preferential treatment of public relative to private sector exposures in financial legislation, moral suasion exercised by the treasury, or outright financial repression. The liquidity and safety of these government bonds may in reality be fragile, i.e. these desirable features only exist in tranquil times and are vulnerable to negative shocks. Yet, during market volatility domestic investors may be forced to buy even more of them.

As a result of this financial friction, there is a group of price-insensitive government bondholders. Shocks in the 'local' supply or demand of these preferred government bonds cannot be easily absorbed through substitution with other assets (unless these are comparable) and changes in their scarcity will initially only transmit to the interest rate for this sub-set of bonds without affecting yields outside this habitat (see D'Amico et al., 2012). Taken on its own, the imperfect substitutability between preferred and alternative bonds causes persistent market segmentation along the lines of their maturity and/or security. Note that for financial repression to work the government must be able to maintain market segmentation, otherwise investors will flee to other jurisdictions or to private sector bonds

The second financial friction consists of risk-related *arbitrage restrictions*. These arise when another group of investors in principle treats all national securities as perfect substitutes and is ready to initiate carry trades between them in response to demand or supply shocks but is hesitant to fully assume the role of arbitrageur in a risky world. Their portfolios may be sensitive to risk and these investors may themselves be risk averse. The importance of this financial friction may depend on the size of their liquidity and capital buffers, i.e. the ability to continue trading in the face of declining liquidity and absorb unexpected capital losses from trading. The resulting arbitrage restrictions and under-reaction to demand and supply shocks may relate to a multitude of duration risks – including inflation risk, interest-rate risk and credit risk – that tend to increase when investing further out the maturity spectrum. To overcome their risk aversion this group of investors will demand a positive expected return for changing the composition of their portfolios, i.e. they will require compensation for the duration risk associated with adding longer-term government debt securities that promise a higher but more uncertain return. This condition will manifest itself in time-variant term premia that cause a deviation in prevailing sovereign bond yields from those that are derived solely from the anticipated path of short-term interest rates (see D'Amico et al., 2012).

The available compensation for the duration risk of holding government bonds with a longer maturity induces arbitrageurs to trade with preferred-habitat investors. This arbitrage activity clears the government bond market and integrates the capital market across all maturities and associated risks. Reaching this equilibrium after a localised shock assumes that preferred-habitat investors – although they are reluctant to substitute across bonds with different maturity and/or security characteristics – are nevertheless willing to step in or out of their comfort zone of 'local' sovereign bonds if the price is right (for example, by moving into or divesting from real estate), since this is necessary to clear the otherwise segmented markets (Vayanos and Vila, 2009). The localised shock should be expected to generate the strongest initial yield reactions in the affected and adjacent market segments while

arbitrage activity would spread the effect of the shock to other parts of the maturity spectrum as well. As the necessary change of asset preferences by preferred-habitat investors and the process of market clearing may take time, the term premium will likely also reflect adjustment costs.

Recent empirical studies confirm the existence of a variable term premium in sovereign bond yields and throw a new light on the ability of treasuries and central banks to influence the cost of borrowing by changing the 'local' demand and supply of sovereign bonds as well as their attractiveness as relatively safe and liquid assets. For example, considerable interest rate effects were observed when the United Kingdom undertook a pension reform in 2004 and pension funds responded by tilting their sovereign exposures towards long-term bonds (Vayanos and Vila, 2009). As another case in point, the US Treasury implemented from 2000 to 2002 a buyback program for high-yielding very long-term debt securities while cancelling its issuance of 30-year bonds in order to shorten the average maturity of government debt and reduce the overall cost of debt service. The announcement of this debt-management operation caused significant expected scarcity effects and depressed very long-term interest rates relative to yields on shorter maturities in line with the preferred habitat theory. As trading subsequently became more concentrated in debt securities of shorter duration the intervention also had the opposite effect of raising the liquidity premium in the thinner market segment of very long-term bonds (Kuttner, 2006). A significant negative relationship was also observed between the supply of US Treasury bonds (as an indicator of the availability of liquid and safe instruments) and the spread between triple-A rated corporate and sovereign bonds of the same maturity (Krishnamurthy and Vissing-Jorgensen, 2012).

These empirical findings suggest that treasuries could in theory vary the supply of government bonds and the maturity composition of public debt and exploit their debt management operations as a macroeconomic or financial stability tool to influence the term premium, longer-term interest rates, the yield curve, corporate bond spreads and bank lending spreads, and thereby affect not only their own funding costs but also private borrowing costs, the exchange rate and economic growth. This changing view on the relationship between public debt management and market interest rates – going back to views prevailing in the first decades after World War II – had a major impact on recent academic and central bank thinking about the efficacy of alternative tools available to monetary policy, notably in situations when the official interest rate had reached the zero (or effective) lower bound and other approaches for providing monetary stimulus were sought for. The main conclusion was that central banks could also – as a complement to or substitute for reducing short-term interest rates and giving forward guidance – directly target lower interest rates further out the yield curve (Kuttner, 2006).

At least five options have been put forward for monetary interventions in the sovereign bond market.

A central bank could first of all swap treasury bills for bonds in order to tilt the slope of the sovereign yield curve down at the longer end. This 'Operation Twist' changes the composition of the central bank balance sheet while keeping its size constant. As mentioned in Box 6.1, it was initiated in the US by the Kennedy Administration in 1961 and repeated by the Federal Reserve between September 2011

and June 2012 when it bought Treasury securities with remaining maturities of 6-30 years while selling an equal amount of short-term Treasury paper with a remaining maturity of 3 years or less.

Second, it could announce the firm intention to undertake unlimited interventions in sovereign bond markets as necessary to achieve macroeconomic or financial stability objectives. When fully credible, as might be expected given the monetary powers of a central bank, such a commitment to a contingent balance sheet expansion might already be sufficient to move bond yields in the desired direction – although at some point market participants may want to test this promise (see the remark by a discussant in Krishnamurthy and Vissing-Jorgensen, 2011). The ECB's contingent programme of sterilised Outright Monetary Transactions (OMTs) in volatile national sovereign bond markets is the most prominent example of this option (see also ECB, 2015; Cour-Thimann and Winkler, 2016).

Third, the central bank could purchase a substantial amount of treasury securities as an instrument to manage expectations; not so much because it expects a significant impact on bond prices but to signal to markets its commitment to keeping the official interest rate lower for longer. Eggertsson and Woodford (2003) show that when financial markets are frictionless, a programme of buying safe government bills or bonds in exchange for monetary reserves that earn a market-based interest and are default-free by definition is neutral in its effect on the price and volume of safe and liquid assets. However, forward guidance in this situation could still affect market expectations and ease monetary conditions. A large balance sheet expansion serves in this respect as a signalling and commitment device. After all, raising the policy rate would inflict valuation losses on the central bank's own bond portfolio which it would prefer to avoid for as long as possible. The monetary transmission of this communication would take place along the usual channel of expected future short-term interest rates.

Fourth, the central bank may undertake large-scale outright purchases of government bonds of medium to longer-term maturities with the aim to absorb duration risk from investors and compress credit and liquidity risk premia. This quantitative easing will directly lower the level as well as the slope of the sovereign yield curve. As the desirable expansion of the central bank balance sheet over the horizon of the purchase programme is laid out in advance, the announcement effect on sovereign bond yields will dominate the subsequent impact of the actual purchases. The ultimate effect remains uncertain due to other factors affecting longer-term interest rates in the meantime, such as changes in inflation risk, and global capital market shocks (Krishnamurthy and Vissing-Jorgensen, 2011, discuss various channels through which the impact on interest rates may materialise).

Fifth, public debt operations have been suggested as a way to underpin a central bank strategy of capping long-term interest rates at a specific level or also yield curve control, as applied by the Federal Reserve from 1942-1951 (see Box 6.1) and by the Bank of Japan since August 2016 (see Section 6.6.2). The resulting expansion of the central bank balance sheet in this case becomes endogenous, as the quantity of government securities that the monetary authority will have to buy in order to successfully peg a pattern of interest rates depends on evolving market conditions and must be kept open-ended (see Friedman, 1968; Bowman et al., 2010).

These five forms of monetary interventions in the sovereign bond market each have their costs and benefits. They are reminiscent of old-style monetary policies. As happened automatically in the past when the central bank was an arm of the state, such unconventional measures by an independent central bank would nowadays also require coordination with treasuries and supervisors (Hoogduin and Wierts, 2012). Without it, public debt managers focused on cost minimisation are likely to use the opportunity of declining long-term interest rates to issue more long-dated bonds, which counters the intention of monetary policy to take out duration risk (Greenwood et al., 2014). Micro-prudential supervisors might call for precautionary measures when they worry about falling bank interest margins, declining sovereign asset returns for institutional investors, the scarcity of high-quality and liquid assets and the reduced incentives for market-makers in government debt securities. Macro-prudential authorities may have systemic concerns and could decide to raise counter-cyclical capital buffers to avoid that financial institutions, in a search for higher yields, substitute into too risky assets.

6.6.4   *Managing the sovereign yield curve in the special case of the euro area*

EMU is a monetary union without a fiscal union and there is therefore no federal or supranational treasury in the euro area that issues its own eurobonds. A single sovereign benchmark asset for the euro area capital market and financial system is missing (van Riet, 2017a). A euro area government bond yield and a single euro area yield curve therefore do not exist and can only be approximated by taking the average of the national sovereign bond rates and the corresponding yield curves (possibly restricting the aggregation to 'risk-free' triple-A rated member countries).[75]

Since the eurozone capital market is characterised by national debt securities issued by subsidiary governments it is important for risk-sensitive investors to consider *country-specific risks* in addition to common risk factors (while intra-euro area exchange-rate risk has been eliminated by the single currency). This <u>third financial friction</u>, which is typical for EMU, requires arbitrageurs to act as a bridge between preferred habitat investors across the whole euro area. The dispersion of country-specific risks is therefore a significant fundamental factor affecting sovereign bond spreads between euro area countries as well as the euro area average of national government bond yields.

The aggregated euro area sovereign bond yield R_t for a specific maturity (m) is an average of the corresponding national bond yields $R_{i,t}$ of the c member countries (c = 19 at the time of writing), each weighted by a factor ω_i, as in equation (6.7). These portfolio weights could, for example, reflect the relative size of national government bond markets, relative GDP, the ECB's capital key, or any other preferred variable depending on the purpose of the aggregation (with the weights ω_i adding up to 1).

$$R_t = \sum_{i=1}^{c} \omega_{i,t} \left[\left(\frac{1}{m} \right) \sum_{t=1}^{m} S_{i,t} + \rho_{i,t} \right] \qquad (6.7)$$

Taking the perspective of an individual euro area country i, the price of the government bonds that it issues will combine factors that are common to all EMU members, notably the monetary policy rate of

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[75]   A relatively new option is to calculate the risk-free overnight index swap curve for the euro area; see ECB (2014).

the ECB, as well as domestic risks associated with national bond market conditions (abstracting from the common term premium related to duration risk). Aggregating across all member countries c, the euro area average sovereign bond yield for maturity m (and the corresponding yield curve) can be related to the common anticipated path of short-term interest rates S_t and to the average of country-specific term premia $\rho_{i,t}$ weighted, for example, by the share of each national government bond market, as in equation (6.8):

$$R_t = \left(\frac{1}{m}\right) \sum_{t=1}^{m} S_t + \sum_{i=1}^{c} \omega_{i,t}\, \rho_{i,t} \qquad (6.8)$$

At the eurozone aggregate level the average term premium therefore comprises country-specific risk factors, such as liquidity risk, default risk and even currency redenomination risk. As an illustration, equation (6.9) splits the weighted average term premium $\rho_{i,t}$ of equation (6.8) into country-specific liquidity risk $\alpha_{i,t}$, credit risk $\beta_{i,t}$ and currency redenomination risk $\gamma_{i,t}$:

$$R_t = \left(\frac{1}{m}\right) \sum_{t=1}^{m} S_t + \sum_{i=1}^{c} \omega_{i,t}\, [\alpha_{i,t} + \beta_{i,t} + \gamma_{i,t}] \qquad (6.9)$$

Some investors exhibit a strong (home) *country bias within EMU* rather than a euro area bias, reflecting the nature of the economic and financial policies of the 19 member countries (see for example Darvas and Schoenmaker, 2017). This preferred habitat derives inter alia from cross-country differences in the protection of property rights, a mandatory demand for debt securities issued by the country of residence, or moral suasion of residents to invest in own government bonds, i.e. the existence of captive national sovereign bond markets. The temporary capital controls applied in Cyprus and Greece even separated the domestic capital market by law from the rest of the eurozone and other parts of the world (with some exemptions). Moreover, the fiscal sustainability, financial stability and economic performance of euro area countries differ appreciably and will affect the perceived country risks. Absent top-rated eurobonds, some institutional investors typically may only hold national sovereign bonds with a triple-A rating, which restricts their choice among member countries considerably; in extreme situations, they may only be able to hold the benchmark bonds of the safest country, i.e. Germany. Over the years, the preferential regulatory treatment of claims on EU sovereigns, labelling them as 'zero risk' and exempting them from exposure ceilings, likely helped to contain these fundamental sources of market segmentation and bond price differentiation within the eurozone.

These capital market frictions based in deviating national policies and the home bias of investors function as *cross-border arbitrage restrictions* and would be much less prominent in a mature monetary union governed by a single sovereign. Again, arbitrageurs will interact with the preferred-habitat investors in response to demand or supply shocks to clear the national government bond markets and their cross-border activity will also integrate the euro area sovereign bond market. However, their tolerance for adding country-specific risks to their euro-denominated portfolios is presumably limited for debt securities issued by low-rated member countries or those with captive

domestic bond markets, even more so when these portfolio adjustments also require them to accept sovereign exposures over a longer period. To overcome these arbitrage constraints, risk-averse arbitrageurs will require a reward in the form of country-specific sovereign risk premia that offer them a positive expected return while taking account of spill-over effects. The more risk averse they are, the higher the national bond risk premia must be to induce them to undertake these trades, especially for longer maturities further out the yield curve. A shock to the 'local' demand or supply of national government bonds which affects the magnitude of country-specific risks (on top of common duration risk) will therefore trigger price changes across the whole maturity spectrum for that country. Arbitrageurs may propagate the negative risks across all member countries with implications for EMU stability if the correlation is very strong. On the opposite side, their arbitrage activity may spread the positive stabilisation effects of EMU-wide public policies across the whole eurozone.

Following the creation of the euro, a search for yield across the single currency area (which was also fuelled by large gross capital inflows from outside the euro area) suppressed these risk premia for a long time, leading to an unsustainable convergence of sovereign bond yields. By contrast, the flight to safety in the euro area sovereign debt crisis explains the correlated spikes in the bonds yields of vulnerable member countries and the interest rate discounts (negative risk premia) for safe-haven countries, notably Germany. The resulting fragmentation in the euro area sovereign bond market seriously hampered an even monetary transmission across the whole eurozone. Confidence-building measures taken by the European leaders and especially the ECB's exceptional monetary interventions helped to remove the euro break-up risk premia in the bond yields of vulnerable countries and contributed to a steady narrowing of their interest rate spreads vis-à-vis Germany after mid-2012 (see Section 6.7.3 and Krishnamurthy et al., 2017).

As consumer price inflation fell to around zero and output growth remained sluggish, the ECB subsequently set out to provide additional credit easing for households and firms. With the public sector purchase programme (PSPP) announced in January 2015 the ECB targeted a reduction in the euro area average sovereign yield curve but unavoidably also suppressed national term premia. The monthly purchases of government bonds according to each country's share in the ECB's capital were intended to make them overall scarcer and more valuable in the market as well as to extract general liquidity risk and credit risk. The equal treatment of euro area countries in this quantitative easing, irrespective of the country-specific risks associated with their government bonds, helped to overcome the cross-border arbitrage restrictions and to integrate national preferred habitats. The non-discrimination principle unavoidably enforced a narrowing of sovereign bond spreads and reduced the existing fragmentation in terms of financial prices, at least for the duration of the PSPP and the reinvestment of maturing bonds (see Section 6.7.4 for more details).[76]

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[76] The equal treatment of national government bonds applies to investment-grade bonds (unless the country had received a waiver) and is subject to issue and issuer limits and an allocation of most potential losses to the national central banks, which taken together should have sustained some country-specific risk spreads in government bond yields.

6.7 ECB monetary policy and the secular decline of interest rates in the euro area

6.7.1 Two perspectives on ECB monetary policy

The ECB assumed responsibility for the single monetary policy of the Economic and Monetary Union (EMU) on 1 January 1999, when the euro was introduced. EMU membership increased from 11 Member States of the European Union (EU) at the start to 19 on 1 January 2015. The primary objective of the ECB is to maintain price stability for the euro area. Without prejudice to this objective it is called upon to support the general economic policies in EMU. In addition, it is expected to contribute to the smooth conduct of the policies relating to financial stability and the prudential supervision of credit institutions that initially remained under responsibility of the competent national authorities.

ECB monetary policy during 1999-2016 and the secular decline of interest rates in the euro area can be judged from two opposite perspectives (neither of which necessarily corresponds to the Governing Council's own explanations to the public). On the one hand, if the euro area was affected by secular stagnation from the demand side, as suggested by Summers (2014), monetary policy was too tight compared to estimates of the natural or neutral real interest rate. This assessment applies especially after 2012 when the key interest rates were constrained by the zero lower bound while inflation fell durably below the level consistent with the ECB's medium-term definition of price stability. Absent a euro area fiscal capacity or euro area budget, national fiscal policies should have been more supportive of ECB monetary policy to lift aggregate demand in the euro area, in particular in the current account surplus countries. Arguably, this would have been preferable to experimenting with non-standard monetary tools after the crisis which created budgetary advantages, carried risks for financial stability, affected the income and wealth distribution and may have hurt public trust in the Eurosystem. Assigning a greater role for national fiscal policies in the euro area policy mix assumes, however, that investors consider the subsidiary governments of the euro area as 'safe' borrowers with the necessary fiscal space to contribute to euro area macroeconomic stabilisation (van Riet, 2017d, 2018).

On the other hand, taking an Austrian perspective as put forward by Cachanosky and Hoffmann (2017), ECB monetary policy was too complacent in response to strong money and credit growth in the run-up to the banking crisis of 2008. By contrast, during the euro area crisis and even more so during the low inflation episode the single monetary policy was too interventionist and distorted asset prices by pushing interest rates to ultra-low levels along the entire yield curve. Apart from the adverse side-effects in the private sector, the low-interest-rate bias and the ample supply of central bank liquidity significantly eased the budget constraint of national governments, suggesting evidence of financial repression with Austrian-style economic consequences. A preferable alternative was for the ECB to let financial market prices anchored by the natural interest rate guide private agents as well as the public sector in repairing their weakened balance sheets, in particular in the high-debt countries. For a sustainable economic recovery euro area public policies had to rely much more on market processes for correcting misallocated resources and strengthening the supply side of the economy.

Since the natural interest rate is by definition unobservable, an empirical assessment of whether ECB monetary policy was too tight or too loose with regard to this benchmark is hardly possible. This study therefore refrains from passing a judgement. The following sections instead try to identify important signs of secular stagnation as well as key features of financial repression related to the euro area monetary stance over the past 10 years. As regards the Austrian aspects, Oppers (2002) proposes to examine relevant business cycle indicators in each of its three phases:

1. Harbingers of recession early on in *the cyclical upswing*, notably, strong credit growth in particular in sectors suggestive of overinvestment or malinvestment.

2. A too large and unproductive capital stock *after the cyclical peak*, as evident from a low-quality portfolio of banks and unprofitable firms that are kept alive by cheap credit.

3. A slow response of the economy to a monetary stimulus *after the recession has taken hold*, because public and private sector deleveraging and restructuring are postponed or cancelled, triggering (political calls for) further monetary accommodation that then sets off a new boom/bust cycle.

As will become clear, secular stagnation and persistent low inflation have been a powerful argument for the ECB – in addition to financial stability concerns – to maintain an easy monetary stance. At the same time, it is plausible that suppressed interest rates have distorted the euro area flow of funds and propagated unsustainable Austrian business cycle dynamics.

6.7.2 *ECB monetary policy 1999-2007: a credit boom fuelling imbalances*

At the introduction of the euro the countries that joined were assessed to have achieved a satisfactory sustainable convergence of their economies in terms of price developments, public finances and long-term interest rates, as demonstrated by their ability to keep their mutual exchange rates in narrow fluctuation margins over at least a two-year period. Euro area members were henceforth under the obligation to treat their economic policies as a common concern and to maintain sound fiscal policies in line with agreed budgetary rules and subject to market discipline. Altogether, this justified the initial expectation that the EMU member countries would have the necessary buffers and flexibility to address asymmetric shocks and the differential impact of the single monetary policy.

The two-pillar monetary strategy

When the ECB assumed responsibility for monetary policy in the eurozone it faced the challenge of earning at least the same high credibility for successfully maintaining price stability as the Deutsche Bundesbank. This resulted in the design of an ambitious monetary policy strategy. Over the previous five decades German inflation had been only 2.6% on average (see Issing and Wieland, 2013) and the Governing Council of the ECB defined price stability (after a review of initial experience) as corresponding to a euro area inflation rate of below, but close to, 2% over the medium term (see Figure 6.7).

Figure 6.7 – Consumer price inflation in the euro area, 1999-2016

(annual percentage changes)
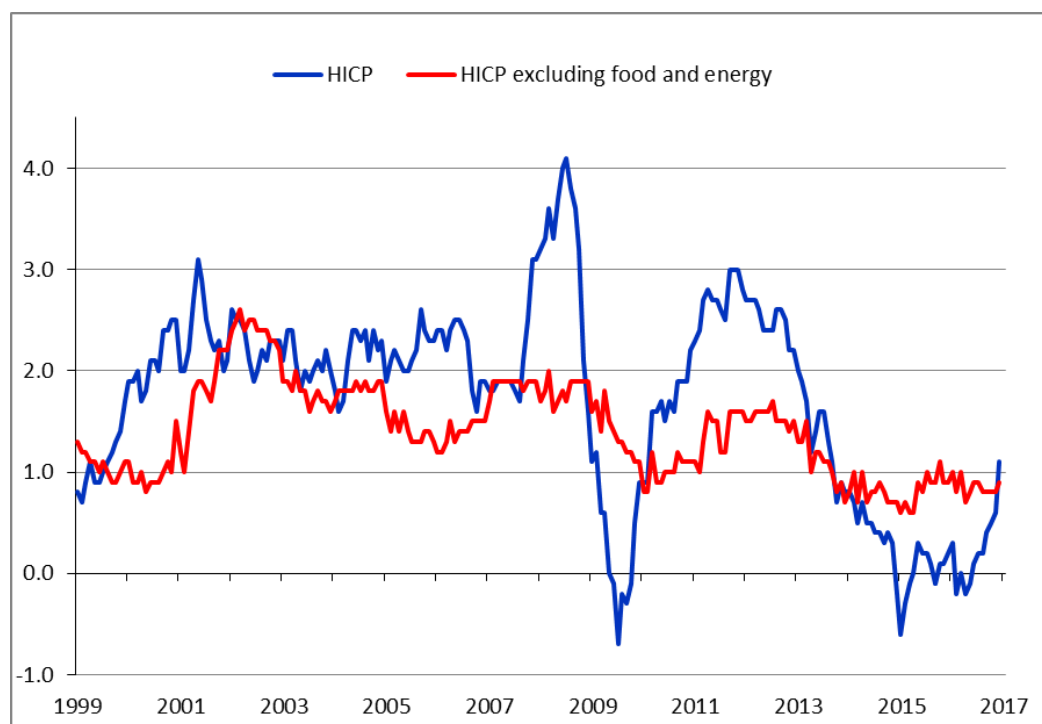
Sources: Eurostat. Latest observation: December 2016.

Note: HICP = Harmonised Index of Consumer Prices for the euro area in changing composition.

The ECB announced a two-pillar monetary policy strategy – targeting neither money, nor inflation – which entailed a comprehensive forward-looking analysis of economic as well as monetary conditions in the euro area. The short-term inflation outlook based on macroeconomic conditions was always to be cross-checked with the medium-term inflation trend associated with money and credit growth.

For the acceptable annual growth rate of the broad monetary aggregate M3 a reference value of 4½% was set. This benchmark recognised the existence of a stable long-run relationship between money growth and inflation at the euro area level, as confirmed by empirical studies. At the same time, monetary policy would not react in a mechanic way to deviations of M3 growth from its reference value. A monitoring of credit naturally found its way in the monetary analysis as a key counterpart to M3 on the balance sheet of the money-creating sector.

During the first nine years of its existence, the single currency was perceived as delivering remarkable stability (ECB, 2008). The ECB was successful in securing medium-term price stability for the eurozone broadly in line with its definition (Figure 6.7). Furthermore, all countries participating in the euro appeared to enjoy its economic benefits, leading to a decent albeit no stellar performance of the euro area economy, also in comparison with the United States.

Figure 6.8 – ECB key interest rates and EONIA, 1999-2016

(percent per annum)
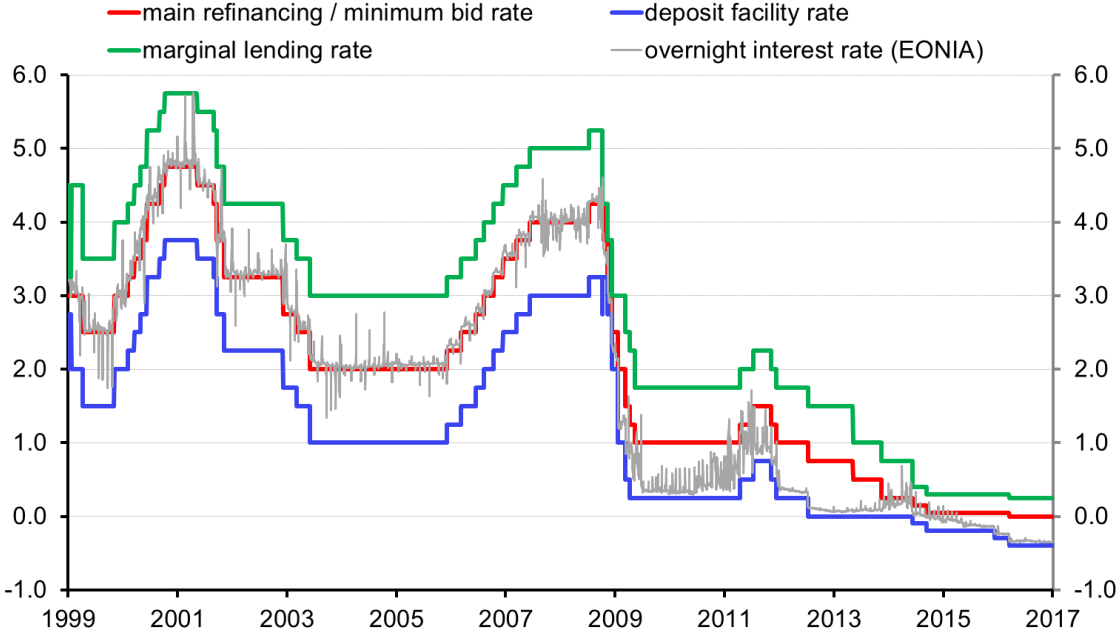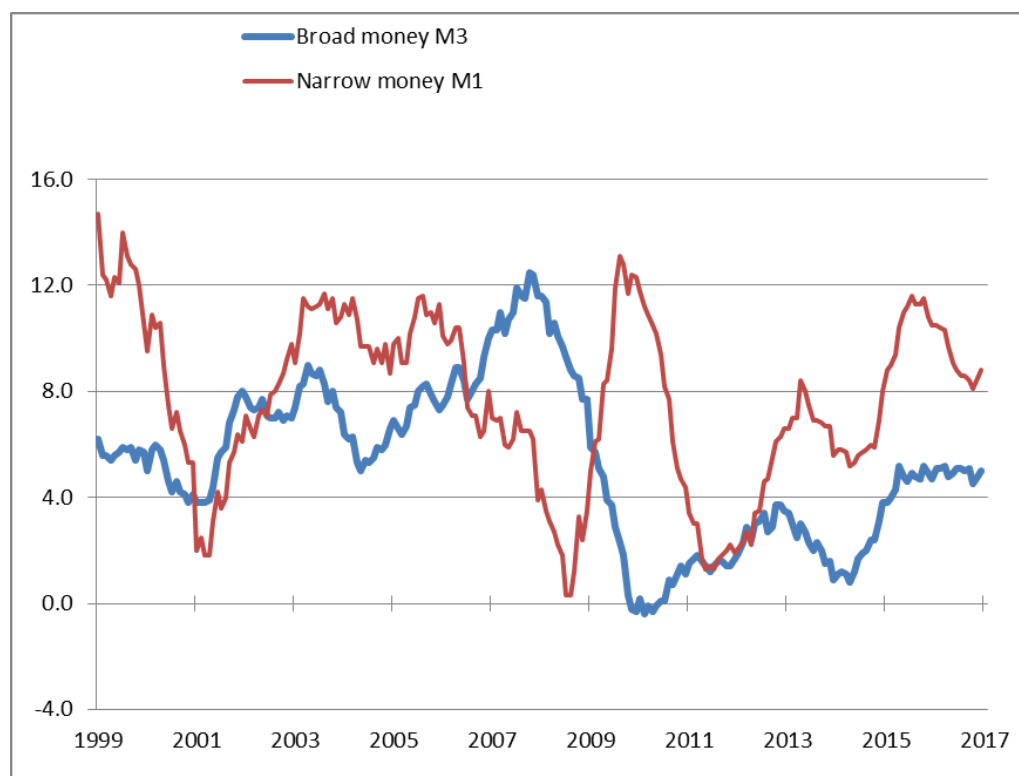

Source: ECB. Latest observation: 31 December 2016.

Note: EONIA = euro overnight index average.

After a temporary reduction of the minimum bid rate in the spring of 1999, the following monetary policy decisions involved a path of rising official interest rates from late 1999 until spring 2001 (Figure 6.8), inter alia to deal with the inflationary implications of the substantial depreciation of the exchange rate of the euro. Soon it received unsolicited advice from politicians to ease its monetary policy stance, which was naturally put aside. There was also pressure to translate the expectation of a permanently higher potential growth rate of the 'New Economy', thanks to the boom in information technology (IT), into a higher reference value for M3 growth and to maintain correspondingly lower key interest rates. After having analysed the evidence, the ECB stated that in its view the conclusion of a higher euro area potential growth path was premature. This initial experience showed that the ECB guarded its political independence and was perceived as relatively hawkish.

The IT-boom indeed turned out to be a bubble. Once it had collapsed, official interest rates were reduced in response to the outlook for lower inflation. After a pause, the ECB cut its key rates further and the minimum bid rate was set at a relatively low level of 2% (implying a real rate of about zero) from early 2003 to late 2005. This reflected inter alia that core inflation declined (Figure 6.7) and the gradual appreciation of the euro kept the upside risks to inflation in check. Yet, from that moment on, the growth of bank loans to the private sector, closely followed by M3 growth, steadily accelerated to 10-12½% in 2006-2007 (Figures 6.9 and 6.10).

Figure 6.9 – Narrow and broad money growth in the euro area, 1999-2016

(annual percentage changes; adjusted for seasonal and calendar effects)

Source: ECB. Latest observation: December 2016.

Disregarding the signals of the monetary pillar

As explained in ECB (2008), the initial pick-up in M3 growth in these years was considered to be relatively modest and affected by statistical uncertainties and, hence, did not pose a serious monetary policy concern. This assessment was too complacent, given the fact that M3 growth continuously exceeded the reference value of 4½% (at least since 2001), which created a growing excess supply of money. Only in December 2005, when broad money and private sector credit growth already stood at 8-9% and headline inflation was well above 2%, did the Governing Council interpret the underlying monetary expansion as signalling a risk to medium-term price stability and initiated a step-by-step increase in official interest rates. Although the ECB's key interest rates never reached their earlier peak of the year 2000, the short-term real rate was equally high as at the turn of the century. Narrow money and household loans decelerated, but the growth rates of broad money and credit to the non-financial corporate sector initially stayed very high (Figure 6.9 and 6.10).

Fahr et al. (2013) identify two countervailing financial factors which still relaxed monetary conditions, especially for the corporate sector: first, long-term interest rates were on a steady downward path in line with the global trend and second, credit risk premia for firms fell steeply. Strong credit growth for corporations in turn fuelled broad money growth. According to the ECB, M3 growth also reflected to some extent speculative demand for monetary assets outside M1 in response to the relatively flat and

at times inverted yield curve, which overstated the underlying monetary dynamics. Furthermore, foreign savings searching for safe investments contributed to growing gross capital inflows, favouring the core countries. The relaxation of financial conditions spilled over to the rest of the eurozone.

Figure 6.10 – Bank loans to the private sector, 1999-2016

(annual percentage changes; unadjusted)
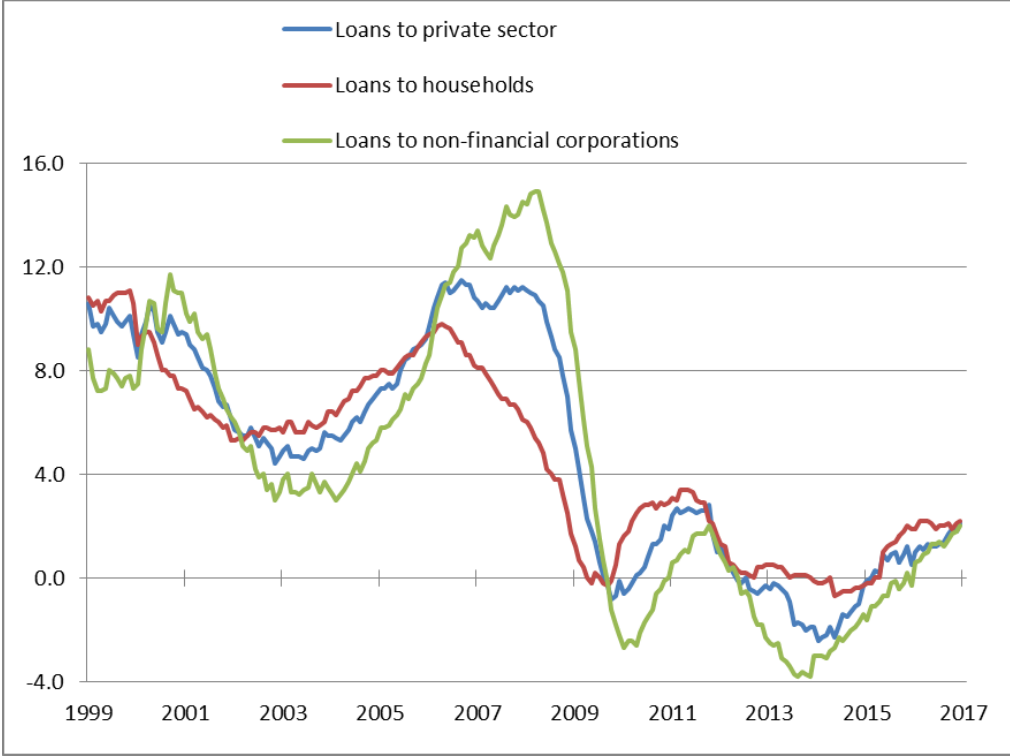
Source: ECB. Latest observation: December 2016.

Cross-border banks in the core countries in search for higher yields were keen to intermediate credit at relatively favourable conditions to their counterparts in other euro area countries and their booming commercial and residential property sectors. The debt-based capital flows fuelled in particular real estate markets that offered the prospect of strong price increases but as speculative investments made little if any contribution to productivity growth. The attending rise in property prices created wealth effects which together with rising labour and dividend income gave a boost to private consumption and inflated local consumer prices and asset values, despite higher short-term interest rates.

This combination of malinvestment and overconsumption showed the typical features of a credit-based Austrian boom; it was further amplified by national tax and regulatory policies that promoted home ownership and restricted land use, as well as public investments in infrastructure (roads, airports) based on exalted expectations of future output growth. Meanwhile, the German housing market remained stagnant. The mediocre economic performance of Germany (at that time widely seen as "the sick man of Europe") acted as a drag on euro area average output growth and inflation in the first half of the 2000s, explaining the half-hearted response of the single monetary policy.

Governments also enjoyed a high demand for their semi-safe bonds, on the back of the equal regulatory treatment of euro-denominated sovereign debt as entailing zero credit risk without the need for exposure limits. On this basis, investors may have assumed that public debt was free from default risk. The euro area countries with a past record of high inflation and interest rates saw their sovereign and corporate bond yields converge towards the corresponding German yields (which declined in line with international trends), thereby reaching historically very low levels. Minenna (2016) observes that in fact a single sovereign interest rate curve arose across the eurozone.

Growing economic imbalances inside the euro area

Over the years 1999-2007 several member countries saw increasing macroeconomic imbalances, fiscal vulnerabilities and financial risks. These resulted in deviating balance of payments positions, creating a cleavage between current-account deficit and surplus countries inside EMU (van Riet, 2016). As Summers (2014, p.69) put it: "the strong performance of the euro in the first decade of this century was unsustainable and reliant on financial flows to the European periphery that in retrospect appear to have had the character of a bubble". The underlying euro area average growth trend may, in his opinion, already have been characterised by secular stagnation due to a long-lasting shortage of effective demand, suggesting that the monetary stance was too tight relative to a decreasing natural or neutral real interest rate.

An early ECB (2004) review also indicated that the natural real rate may have declined since the early 1990s. This was related to fundamentals like the slowdown of productivity and population growth in the euro area, lower default risk premia thanks to progress with fiscal consolidation in the run-up to EMU, the reduction of inflation risk premia and the disappearance of intra-euro area exchange rate risk premia since the euro was introduced. At the same time, the ECB clarified that it did not rely on the concept of the natural real interest rate in the actual conduct of its monetary policy given the statistical uncertainties around the estimates for this unobservable variable. To assess the monetary stance it was important to undertake a broad-based analysis of all relevant information, including money and credit, in a medium-term framework (see also Weber et al., 2008; Fahr et al., 2013).

Cette et al. (2016) relate secular stagnation to the disappointing growth rate of total factor productivity in continental Europe relative to the US frontier, as witnessed already since the mid-1990s. They find that the sharp fall in nominal and real interest rates in Spain and Italy before and after their adoption of the euro fuelled corporate credit growth and capital misallocation which lowered the productivity level, notably in manufacturing. Gopinath et al. (2017) reach similar conclusions, notably for Spain, Italy and Portugal, where the decline in real interest rates fuelled a misallocation of capital inflows towards firms characterised by higher net worth rather than higher productivity. Taken together, these findings suggest that an Austrian-style unsustainable production structure had emerged.[77]

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[77] Gamberoni et al. (2016) find that, among other factors, also the tightening of credit conditions in 2006-2007 contributed to capital and labour misallocations because it prevented credit-constrained firms without own funds from adjusting their production structure.

The missing response to an unsustainable credit boom

Looking back on the pre-crisis episode, at least three interrelated aspects of the single monetary policy would have deserved more attention. First, the weight assigned to the monetary pillar in assessing the risks to price stability was too low and the exclusive focus on consumer price inflation too narrow. This question of the appropriate monetary strategy was for the ECB to address.

The original reference value for M3 growth was not shown any longer in the ECB's *Monthly Bulletin* since December 2007; with 11.5% in Q3 2007 and 12.3% in October it had reached the highest annual growth rate since the early 1980s, based on synthetic estimates of M3 prior to 1999. Issing and Wieland (2013, p.439) wonder "whether the ECB should not have given more weight to its monetary pillar", so that an earlier and faster rise in the monetary policy rate could have weighed against the building up of a credit boom that fuelled M3 growth and led to inflated asset prices and financial risks.

Second, even when focused on the euro area as a whole, the prevailing monetary stance still affected the allocation of credit and contributed to diverging national financial cycles. This aspect required coordinated action of national prudential authorities in promoting healthy financial institutions and safeguarding a stable financial system.

At the euro area level, the credit boom from 2004 to 2008 was mostly driven by bank lending to households for purchasing a house and to non-financial corporations for financing construction and real estate-related activities and, hence, clearly showed its Austrian features (see Figure 6.11).[78] Kim et al. (2013) highlight that money is the balance sheet counterpart of bank lending and its analysis may assist in assessing the vulnerability of the financial system. The composition of monetary aggregates reflects the pro-cyclical increase in bank leverage and may convey information on the degree of risk-taking in the economy. A rising share of the least liquid versus the most liquid components of a broad monetary aggregate can be associated with the expansion of foreign liabilities of the banking sector.

Applied to the euro area, the increasing positive spread between M3 and M1 growth from 2006 to 2008 correctly signalled that cross-border banks from core countries intermediated foreign wholesale funding to banks in the periphery countries which resolved the local shortage of retail savings as a source of financing the high credit demand before 2008. Adding a detailed flow-of-funds analysis of the source and destination of credit flows and their impact on asset prices, this monetary indicator could have given the ECB an earlier warning of the unsustainability of the ever-expanding cross-border bank lending and borrowing activity.[79] Given low real interest rates in the periphery countries, there was also a need for tighter prudential supervision to contain the attendant risks of strong credit growth for private sector balance sheets and financial stability as well as for structural and institutional reforms to support a resource allocation that was more favourable for total factor productivity growth.

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[78] Bezemer (2014) and Turner (2015) stress the importance of distinguishing between credit for financing productive corporate investment and unproductive spending on property and financial assets – as Schumpeter recommended already in the 1930s.

[79] See Winkler et al. (2014a,b) on the usefulness of flow-of-funds data for monetary and financial analysis.

Figure 6.11 – Bank loans to non-financial corporations and households, 2004-2016

(contributions to total annual growth rate in percentage points; end-of-quarter data)
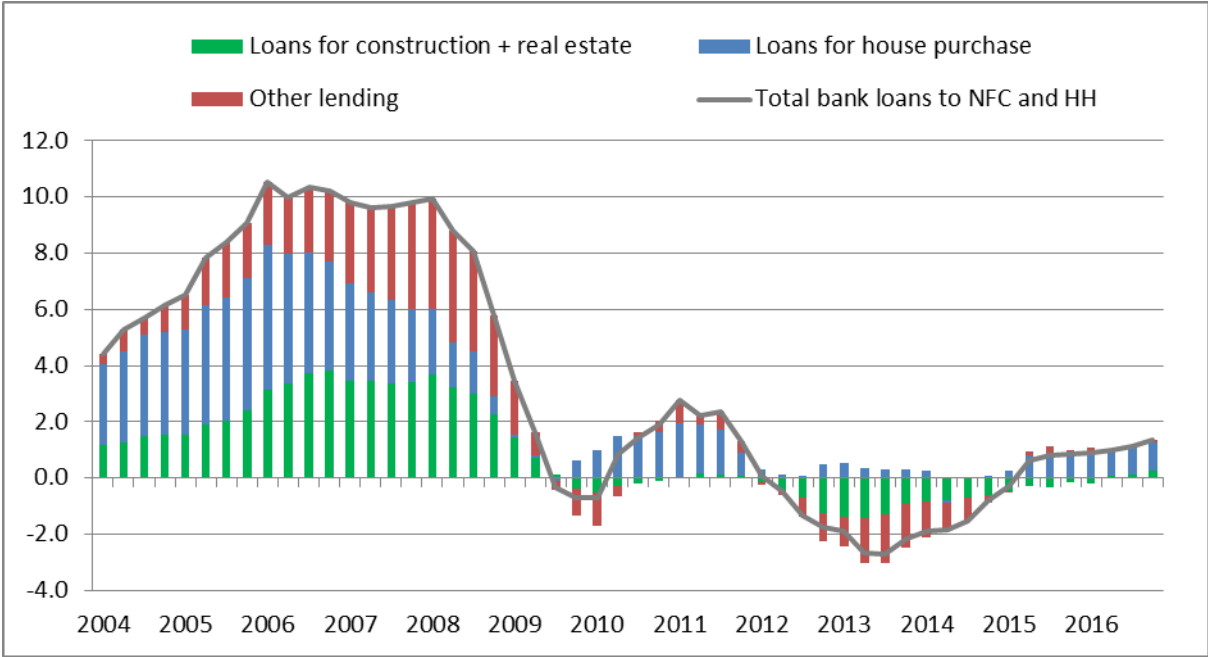
Third, the single monetary policy could not deal with economic divergences and inflation differentials. The member countries were responsible for conducting economic policies that supported sound public finances, flexible wages, dynamic labour markets, competitive product markets and a productive capital structure that enhanced their ability to grow and absorb adverse asymmetric shocks.

Although the euro area authorities were aware of the growing cross-country imbalances, they did not initiate adequate corrective policies, neither on their own, nor under peer pressure or collectively. The strong output growth of the countries with a lower GDP per capita was welcomed as a structural catching up with the more prosperous members. Given that monetary policy was naturally focused on price stability in the euro area as a whole, the ECB had no targeted instruments to address, for example, the one-directional capital flows, continuous credit growth divergences, persistent output growth and inflation differentials and growing regional property bubbles – it could only point to the corresponding risks for EMU stability and tell the national authorities that it was their responsibility to preserve sound public finances, a competitive economy and a resilient financial sector.[80]

Overall, ECB monetary policy could have been more pro-active with regard to strong money and credit growth. Micro-prudential oversight of the banking sector was a national task and often seemed oriented at facilitating the cross-border expansion of domestic banking champions. National macro-

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[80] In the mid-2000s, the ECB published a few studies on the nature of output growth and inflation differentials between euro area countries. The ECB president also regularly showed charts to the euro area finance ministers of the growing deviation between public and private sector wages within some euro area economies and the rising unit labour cost differences between member countries, which carried risks for public finances and competitiveness.

prudential tools that could have dealt with the systemic risks from an ever-expanding financial sector and high asset price inflation were virtually non-existent. A European Banking Union had been excluded from the start of EMU and a European Macro-Prudential Authority was badly missing. Absent more political coordination and integration to enforce sound economic policies the EMU architecture failed to prevent and correct the misallocation of resources. The ever-growing economic and financial imbalances made several euro area countries vulnerable to a large adverse shock. The global financial crisis of 2008 exposed these weaknesses and the fierce market reaction culminated in a combined banking and sovereign debt crisis in 2010-2012 (see Section 4.2.2 and van Riet, 2016).[81]

6.7.3 ECB monetary policy 2008-2012: crisis management [82]

The first sign of cracks in the system became apparent in August 2007 when the sub-prime mortgage crisis in the United States spilled over to the eurozone and the ECB was quick to provide extra liquidity to the banking system in order to stem money market volatility. Following the bankruptcy of Lehman Brothers in September 2008, euro area interbank lending froze as no bank trusted any of its counterparts before getting more clarity on their creditworthiness. While the European Commission and Member States orchestrated a coordinated fiscal stimulus in late 2008, the ECB tried to manage the fall-out from the financial crisis, fighting market volatility and counteracting a credit crunch. The ECB assumed the roles of lender of last resort for the banking sector in order to relieve liquidity stress and of market-maker of last resort in the dysfunctional covered bond market to repair the disrupted channels of monetary transmission. Over time, a plethora of non-standard monetary interventions complemented the traditional interest rate tool, whereby bank refinancing operations were conducted at a fixed interest rate with a full allotment of the requested amounts for as long as necessary (see also Pattipeilohy et al., 2013).

A monetary policy response to financial fragmentation

The financial crisis in the eurozone caused a deep V-shaped economic recession followed by a rapid recovery in 2009. Soon after the ECB had indicated that it would start phasing out its exceptional crisis-related measures, the euro area was hit by a sovereign debt crisis in the most vulnerable member countries, starting in Greece. The spreading of volatility in euro area financial markets and the retreat of foreign investors from the crisis-hit countries to the safer core countries caused sharply rising sovereign yield spreads (see Figure 4.2). This flight to safety triggered a process of financial disintegration and fragmentation of the euro area money and capital markets along national lines of sovereign creditworthiness which hampered the full transmission and singleness of monetary policy.

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[81] The experience of distressed euro area countries looks similar to that of emerging market economies that after the 1970s said goodbye to financial repression, liberalised their financial markets and adopted a fixed exchange rate regime but ignored the vital need for sound macroeconomic and prudential policies alongside. As a result of foreign debt finance, Chile and other Latin-American countries became increasingly exposed to adverse shocks and 'sudden stops' in capital inflows (see Diaz-Alejandro, 1985).

[82] This sub-section partly draws on van Riet (2017b).

Conversely, weakened banks in the vulnerable countries engaged in carry trades and used cheap ECB funding to buy more of the high-yielding debt of their own governments. The adverse interaction between an undercapitalised banking sector and over-indebted governments unable to keep their banks afloat in the end threatened the very existence of the euro (see Mongelli and van Riet, 2013).

Fearing the fall-out from a Greek sovereign debt restructuring for their banking sector, policymakers decided to organise EU/IMF financial assistance for troubled countries that had lost capital market access. Meanwhile, the ECB started a Securities Markets Programme (SMP) of temporary and limited interventions in the disrupted sovereign bond markets in order to ensure continuous monetary transmission throughout EMU and thereby preserve the singleness of monetary policy. Since it was only meant to be a market-making tool, the monetary impact of the SMP was sterilised.

When market conditions looked more stable and inflation risks rose in the first half of 2011, ECB key interest rates were increased twice. However, the ECB again had to reverse course as market volatility returned in mid-2011 and the adverse sovereign-bank feedback loop intensified. Apart from continuing to provide unlimited short-term liquidity to the banking system, the ECB conducted longer-term refinancing operations (LTROs) with an unusual maturity of up to three years and again sought to revive covered bond markets. The ECB's key interest rates hit the floor as the deposit facility rate reached zero in July 2012 (Figure 6.8). When at the end of that month market volatility reached new highs, the ECB president stated that "[w]ithin our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough" (Draghi, 2012). Concretely, the ECB set up a contingent programme of sterilised Outright Monetary Transactions (OMTs) that could be activated in those national sovereign bond markets were price formation was affected by currency redenomination risk in order to safeguard monetary transmission. As Draghi (2012) clarified, "[t]o the extent that the size of these sovereign premia hampers the functioning of the monetary policy transmission channel, they come within our mandate", explicitly excluding liquidity and default risk premia that were inherent to the sovereigns themselves. Hence, the status of euro area sovereigns remained that of semi-safe debtors and their debt issuance was still subject to market discipline (see Section 5.3.2).[83]

Following these extraordinary monetary policy interventions, confidence was broadly restored and the flight for safety abated. This market stabilisation was supported by growing confidence in the strengthening of the EU/EMU economic and financial governance framework as well as the reforms being undertaken in the vulnerable countries. To break the national feedback-loops between banks and their sovereign, euro area leaders agreed in June 2012 to start a European Banking Union – which non-euro area EU countries may join – and to assign both micro- and macro-prudential tasks to the ECB (see Section 3.5.1 and Box 5.1). The subsequent narrowing of sovereign bond spreads reduced financial fragmentation inside the eurozone but the cross-border interbank market remained segmented, notably for unsecured transactions.

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[83] Minenna (2016, p.271) calls the OMT an "anti-spread shield" designed to fight the adverse dynamics of the sovereign bond spreads which could hinder the transmission of monetary policy.

A delayed adjustment and restructuring process

Looking back, the crisis response of European institutions and euro area governments was a quest for structural solutions to stabilise and reintegrate a fragmented EMU and to avoid a repetition. The main burden of dealing with market disruptions in the short run came to rest on the shoulders of the ECB. The banking sector was split geographically in two groups: a group of relatively sound credit institutions in the core countries with more stable economies, where if necessary the governments had the fiscal capacity to provide support, and a category of fragile banks in periphery countries where the governments were mostly in a precarious fiscal position. The monetary policy interventions provided ample liquidity to the banking sector, countered capital flight and financial fragmentation and avoided a breakdown of the euro. These monetary policy actions favoured in particular the crisis-affected countries by removing excessive risk premia in their interest rates and restoring normal financial market conditions. As a result of this stabilisation the stronger nations that had enjoyed capital inflows and lower interest rates lost some of their safe-haven bonus. However, the dire situation in the vulnerable member countries also demanded a fundamental correction of the legacy of misallocated resources entrenched in undercapitalised banks and over-indebted public and private sector borrowers.

The ECB's monetary policy and crisis-related interventions to establish more affordable credit conditions also contributed inadvertently to delaying the necessary consolidation and reallocation of these resources. This assessment can be illustrated by five points.

First, maintaining very low short-term interest rates during the crisis meant that it became more attractive for all euro area governments to shift new debt issuance to short maturities (see for example Hoogduin et al., 2011). To some extent this was also motivated by the need to finance bank rescue operations which initially were expected to require only temporary public money injections (see Section 4.3.1). This maturity shift made governments more vulnerable to a future rise in money market rates and may have formed a political barrier for the ECB to quickly raise its key interest rates again after financial stability had been restored.

The ECB's selective capital market interventions under the SMP slightly dampened volatile sovereign bond yields of the crisis-hit countries, at least temporarily. Even without any interventions in government bond markets, the OMT announcement was interpreted as a credible pledge by the ECB to preserve the euro in the context of a creditor run out of sovereign debt of countries perceived as risky. This virtually removed the currency redenomination risk premia in sovereign bond yields and – although not intended – also steadily reduced the market's perception of sovereign default risk. While the vulnerable euro area countries only slowly proceeded with fiscal consolidation, their rapidly falling bond yields quickly rewarded them with more affordable funding conditions.

Second, the ECB's supply of credit at a low fixed rate and with full allotment of the requested amounts was taken up mostly by liquidity-constrained banks in vulnerable countries. The special offer of longer-term refinancing (LTROs) with a maturity of up to three years was intended to give the banking sector more certainty about the availability of funds for repayment once their own bonds

matured. The allocation in two operations in December 2011 and February 2012 amounted to about EUR 1 trillion in gross terms (or half of this amount when subtracting maturing central bank loans). As it turned out, public debt managers of several crisis-affected countries strategically aligned their issuance to the maximum three-year maturity of this liquidity operation, seeking to benefit from the steepening of the yield curve at the short end (see Section 4.3.2). Also following political calls, many banks parked this exceptional liquidity in own government bonds with a residual maturity of up to three years (see Section 4.4.1). One could therefore argue that the central bank liquidity indirectly financed these governments. As this result was unintended, the ECB later introduced targeted longer-term refinancing operations (TLTROs) which were conditional on banks using the funds borrowed from the central bank for extending their private credit business while excluding mortgage loans for house purchase.

Third, the ECB lowered the minimum credit rating requirement for sovereign bonds accepted as collateral in its refinancing operations to the investment grade level. For countries participating in an EU/IMF adjustment programme a waiver applied to this floor, i.e. for Greece (2010), Ireland (2011), Portugal (2011) and Cyprus (2013) the credit rating threshold for debt instruments issued or guaranteed by these governments was suspended as long as their EU/IMF programmes were on track. As soon as the successful conclusion of the programme was in doubt, such waivers were lifted, as occurred a few times for Greece and Cyprus (see Bindseil et al., 2017, and Figure 6.12). On balance, the waivers helped to ensure a continuous demand for eligible government bonds from domestic banks, enabling them to engage in a profitable carry trade by borrowing cheap from the ECB and investing in higher-yielding, albeit more risky own sovereign debt.

Figure 6.12 - Timeline of minimum credit quality threshold suspensions for government bonds
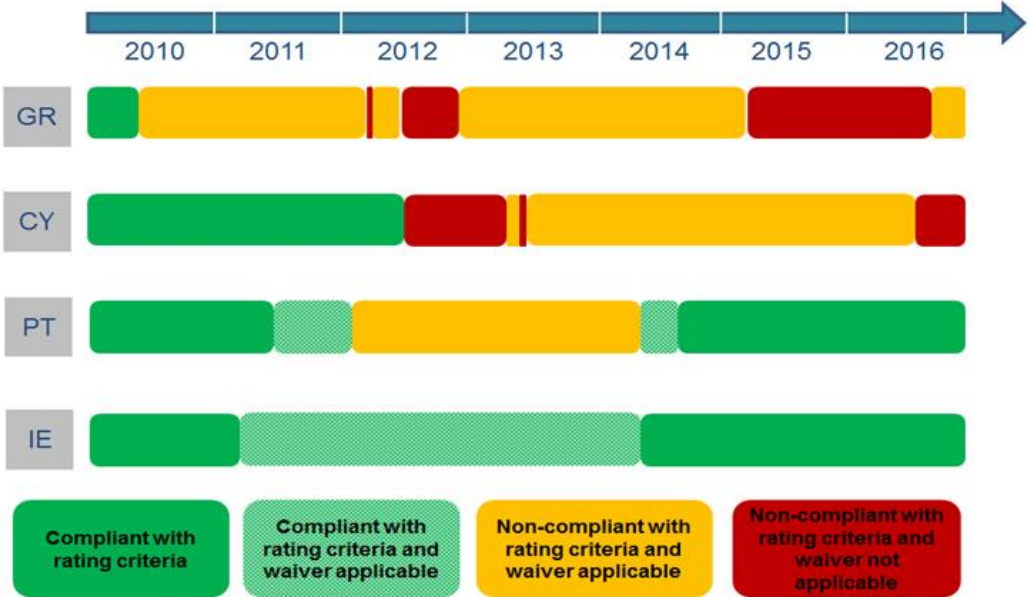
Source: Bindseil et al. (2017, Figure 13).

As noted in Section 4.4.1 of this thesis, state aid also played a role. After the European Commission in the summer of 2011 had extended the temporary relaxation of state aid restrictions, some governments used this opportunity to issue state guarantees against a fee to secure the value of bank bonds issued by domestic credit institutions with sufficient capital but with funding strains in wholesale markets. Some banks retained these newly issued government-guaranteed bank bonds on their balance sheet for own use as collateral in ECB credit operations and were able to place the cheap central bank liquidity in higher-yielding own government bonds – an undesirable feature of the collateral framework which was therefore phased out after March 2015 (Bindseil et al., 2017).

Where a troubled bank has no future, the government will either have to restructure it, arrange for a (new) public entity to take over the impaired assets, inject additional tax money, or else dissolve it. Until a solution was found, the Eurosystem could not provide further liquidity, as this would potentially amount to monetary financing of a public credit institution. However, in some cases the national authorities took their time to wind down the problem bank. As the uncertainty over their future dragged on, these 'zombie' banks were still able to draw on emergency liquidity assistance (ELA) from their national central bank, as long as this temporary support was guaranteed by the government. The ability for credit institutions to get ELA from their national central bank offered opportunities for distressed governments to use this channel for their own funding needs. For example, while the Greek government lost access to the capital market it could still issue short-term treasury paper to resident banks receiving ELA. The only restriction to this route for indirect monetary financing is that the monthly ELA envelope must be approved by the Governing Council of the ECB. Moreover, when the troubled bank failed, the national central bank took hold of the collateral and de facto purchased government debt (see Box 6.2 on the case of Ireland).

Box 6.2 – Emergency Liquidity Assistance for the Irish Bank Resolution Corporation

An example of how a national central bank can end up with government debt on its balance sheet when acting as a temporary backstop for a failed bank is the case of the Central Bank of Ireland and the state-owned Irish Bank Resolution Corporation (IBRC). The IBRC was created on 1 July 2011 out of a merger of two troubled banks taken into public ownership, namely the Anglo Irish Bank and the much smaller Irish Nationwide Building Society. Awaiting its liquidation, this new institution was kept afloat with approximately EUR 42 bn. in emergency liquidity assistance (ELA) from the Central Bank of Ireland (as long as the IBRC was still classified as a monetary financial institution instead of as a government body under control of the treasury).

As security for the central bank's exceptional liquidity provision, the IBRC pledged the non-marketable promissory notes that the Anglo Irish Bank had received in 2010 from the government as part of a bailout operation, as well as most of its assets (with a ministerial guarantee). The nominal value of the promissory notes was some EUR 31 bn. (19% of GDP) and required the Irish government to make substantial interest and note (re)payments to the IBRC over their 20-year maturity, which the IBRC in turn passed on to the central bank as payment of interest on the ELA that it had received. The Central Bank of Ireland valued these promissory notes at EUR 25 bn. after applying a haircut to account for the sovereign credit risks involved.

For the Irish government, ELA was a relatively cheap source of temporarily funding the IBRC as the treasury's own interest payments on the promissory notes pledged as collateral ended up with the central bank, which ultimately passes its profits on to the treasury. However, this was not a durable solution, given the fact that the Governing Council of the ECB had to approve the ELA ceilings and

the emergency lending involved latent monetary financing. Moreover, the promissory notes caused a large burden of annual interest costs and repayments on the government budget (EUR 3.1 bn. or about 2% of Irish GDP over more than a decade) and had to be refinanced. The Irish government was therefore keen to find an alternative way to resolve the IBRC.

As no such solution was found, the government decided in February 2013 to wind up the business and operations of the IBRC. The Irish government took back and retired the non-marketable promissory notes with an average life of 7-8 years in exchange for EUR 25 bn. of marketable treasury bonds with a maturity of 27-40 years priced at a floating interest rate. These government debt securities were passed on to the Central Bank of Ireland as it took ownership of the IBRC collateral. The assets pledged by the IBRC to the central bank – including the ministerial guarantee – were purchased by the National Asset Management Agency that issued government-guaranteed bonds for this purpose (the NAMA is a body created by the government in late 2009 with the task to manage the low-value property development loans taken over from the banking sector).

At the end of the process, the latent form of monetary financing by the central bank was changed in a substantial outright holding of marketable treasury bonds and government-guaranteed NAMA bonds. The central bank is selling these in the international bond market following a schedule of minimum annual bond sales agreed with the Governing Council of the ECB, provided that financial stability conditions permit this. The Irish government immediately saved some EUR 1 bn. in annual interest payments and got a cash-flow benefit of EUR 20 bn. over the following 10 years given the much longer maturity of the floating rate treasury bonds.

Fourth, the OMT announcement was followed by an upward repricing of government bonds, which raised the value of bank holdings of fragile sovereign debt and implied a 'recapitalisation by stealth'. On the one hand, this made countries with weak public finances less exposed to additional bank rescue operations and mitigated the risks from the bank-sovereign nexus. On the other hand, the capital windfall caused banks to resume lending. However, credit constraints were relaxed mainly for existing borrowers. Acharya et al. (2016) find that banks that remained undercapitalised extended some of these loans to low-quality firms at interest rates below those paid by high-quality corporations. This zombie lending – which occurred mostly in Italy, Spain and Portugal – enabled banks to extend non-performing loans and to wait for an economic recovery to improve their borrowers' debt-servicing capacity (see Figure 6.13). Storz et al. (2017) confirm that over the period 2010-2014 weak banks enabled zombie firms to further lever up, in particular in vulnerable countries, whereas healthy firms decreased their leverage. Where national supervisors allowed this forbearance, banks avoided having to recognise losses on their loan portfolios and to report disappointing profits to their shareholders in a 'gamble for resurrection'. Postponing bank restructuring, however, also acted as a brake on the extension of credit to new customers and obliged the ECB to prolong its easy monetary stance.

Fifth, ECB monetary policy and crisis management also lowered funding stress for non-financial corporations. Less well-capitalised banks could thus extend their non-performing loans on relatively favourable terms and conditions. Also, lengthy insolvency procedures were an impediment for banks to initiate corporate restructurings and kept zombie firms alive (Andrews and Petroulakis, 2017). This market distortion reduced credit availability for more productive firms and depressed wages and prices in competitive markets. As a result, less productive firms may have been able to survive, despite realising a lower return on their assets than more profitable competitors (see Acharya et al., 2016).

Figure 6.13 – Non-performing bank loans in the euro area, 2005-2016

(excluding bank provisioning for loan losses, percentage of total gross loans, year-end)
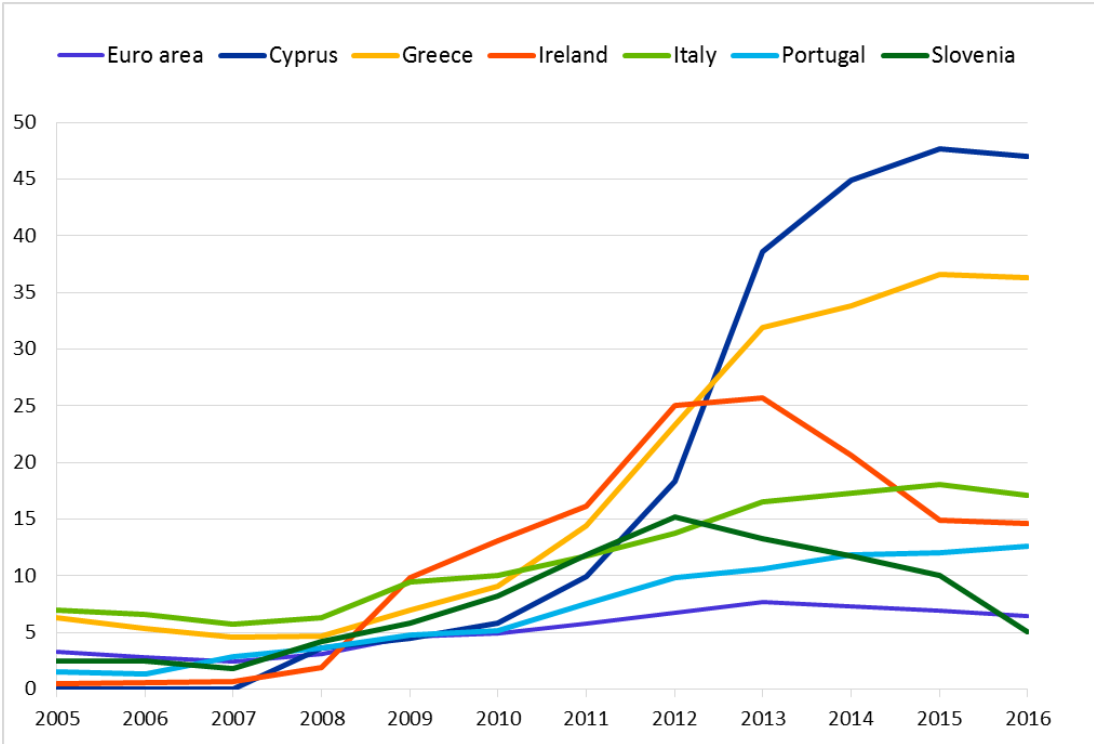
Sources: ECB (2016, Chart B.1, p.134, updated with 2016) and IMF Financial Soundness Indicators.

Note: Comparability of the data across countries may be limited due to the use of different NPL definitions and consolidation perimeters of national banking sectors. Euro area = aggregate of national data, weighted by total loans.

OECD analysis shows that the share of zombie firms – defined as old firms that have persistent problems in meeting their interest payments as compared to a benchmark – increased between 2007, 2010, and 2013. Among the euro area countries, the proportion of zombie firms rose in particular in Belgium, Greece, Italy and Spain, whereas it declined in France and Slovenia (see Figure 6.14, taken from Adalet McGowan, 2017). The capital and labour sunk in zombie firms that are kept alive constitutes a barrier to the reallocation of resources and constrains productivity growth. Hence, the ECB's credit easing measures – instead of relaxing financial constraints on firm restructuring – may have contributed inadvertently to prolonging capital and labour misallocations in the corporate sector, reducing the chances of a rapid pick-up in productivity growth, notably in the vulnerable countries.

Overall, the euro area suffered from a deep financial fragmentation along national lines with the vulnerable member countries suddenly facing much higher interest rates due to liquidity, default and currency redenomination risks and the strongest countries by contrast enjoying a safe haven premium in their interest rates. These public sector interest rate spreads translated in corresponding spreads for domestic private sector borrowers even when these had the same risk profile as their peers across the border. The ECB's non-standard monetary policy interventions tried to reduce this excessive spread in borrowing costs while also providing monetary stimulus by keeping its key interest rates close to or at zero. This prevented a self-fulfilling sovereign debt crisis and stabilised the banking sector but the

ample liquidity and very low interest rates also weakened national policymakers' incentives to consolidate public finances, resolve fragile banks, speed up corporate insolvency procedures, address excessive household mortgage debt, and reform labour, product and housing markets.

The Austrian School argues that postponing the unavoidable adjustment of the production structure after a financial crash will translate in a supply-based secular stagnation, or at best an anaemic recovery, misleading the central bank into easing monetary policy even further. Moreover, the ECB's commitment to stabilising capital markets removed the urgency for euro area governments to advance political integration and to fundamentally strengthen the EMU architecture. As stressed by Eijffinger and Hoogduin (2012), the ECB's intention to buy time carried the risk of time being wasted.

Figure 6.14 – Zombie firms in selected OECD countries in 2007, 2010 and 2013

(share of zombie firms and their capital and labour shares in percent)
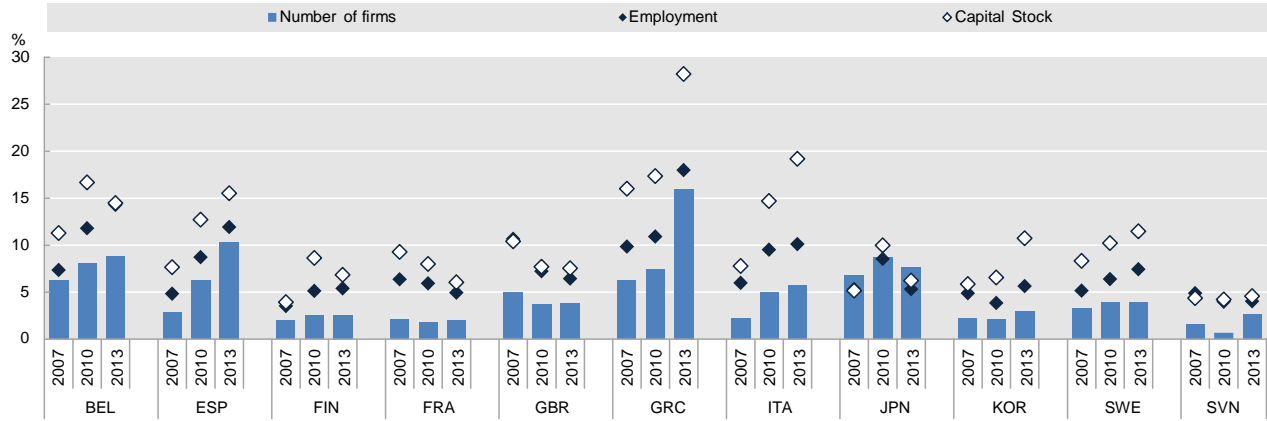
Note: Firms aged ≥10 years and with an interest coverage ratio<1 over three consecutive years. Capital stock and employment refer to the share of capital and labour sunk in zombie firms. . The sample excludes firms that are larger than 100 times the 99th percentile of the size distribution in terms of capital stock or number of employees

Source: Adalet McGowan et al. (2017), Figure A1.

6.7.4 *ECB monetary policy 2013-2016: fighting low inflation* [84]

The sequence of euro area crises was halted in mid-2012 and afterwards financial market volatility gradually dissipated. However, the heterogeneity of economic and financial conditions across euro area countries persisted (Figures 6.15 and 6.16). This situation created challenges for the ECB in ensuring the efficacy and singleness of its monetary policy, which is vital for its ability to anchor price stability. The drawn-out national adjustment processes of fiscal consolidation, bank recapitalisation, private sector deleveraging, restoration of competitiveness and structural reforms constrained the expansion of aggregate demand, dampened credit growth and held back price increases, notably in the vulnerable countries. The steady disinflation of euro area consumer prices to an annual rate far below 2% and the gradual sliding of inflation expectations implied a tightening of short-term monetary conditions since ECB key interest rates already stood at the zero bound. This constellation raised

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[84] This sub-section partly draws on van Riet (2017c).

growing concerns of secular stagnation, persistent low inflation, or even a secondary deflation, challenging the credibility of the ECB in fulfilling its price stability mandate for the whole eurozone.[85]

Figure 6.15 – Composite interest rates on bank loans to the private sector, 2008-2016

(percent per annum; three-month moving averages)

a)   Non-financial corporations   b) Households for house purchase
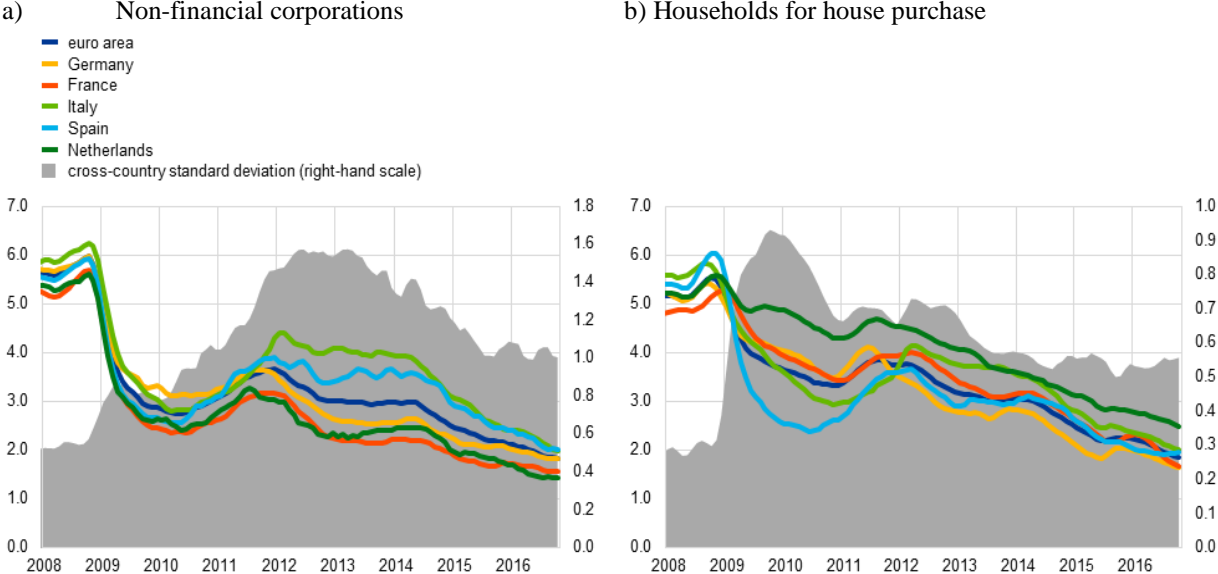
Source: ECB, *Economic Bulletin*, Issue 8, December 2016. Latest observation: October 2016.

Note: The composite cost of bank lending is calculated by aggregating short and long-term lending rates using a 24-month moving average of new business volumes. The cross-country standard deviation is calculated using a fixed sample of 12 euro area countries.

Figure 6.16 – Notional amount of bank loans to the private sector, 2008-2016

(annual percentage changes)

a)   Non-financial corporations   b) Households
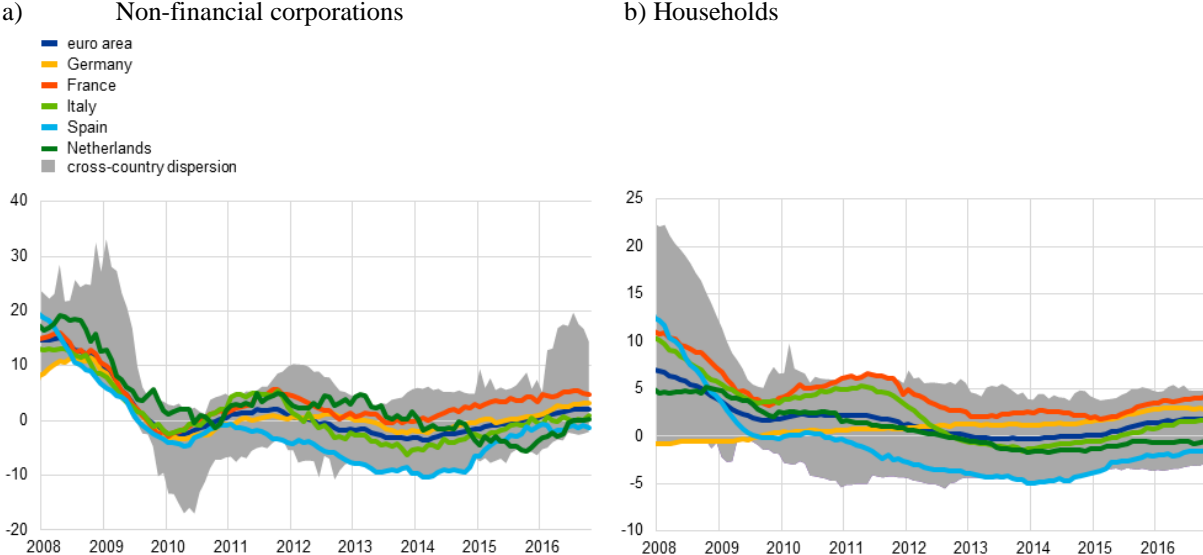
Source: ECB, *Economic Bulletin*, Issue 8, December 2016. Latest observation: October 2016.

Note: Bank loan growth is adjusted for loan sales, securitisation and notional cash pooling. The cross-country dispersion is calculated on the basis of minimum and maximum values using a fixed sample of 12 euro area countries.

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[85] Ciccarelli and Osbat (eds.) (2017) analyse the causes and consequences of low euro area inflation.

As the scope for reducing key interest rates any further had become very limited, the ECB introduced forward communication on its reaction function in June 2013. To influence longer-term expectations of the future monetary stance, it signalled that its key interest rates would stay at the prevailing low or even lower levels for as long as necessary. When consumer price inflation declined to 0.5% in spring 2014, the ECB initiated a comprehensive package of measures to provide the additional monetary accommodation deemed necessary to assist the economic recovery and secure a sustained return of inflation to a medium-term level below but close to 2%. Starting in June 2014, the main refinancing rate was reduced to zero and the deposit facility rate applicable to banks' excess reserves was cut below zero until it reached -0.4% in March 2016 (Figure 6.8). Although the exact position of the effective lower bound was left open, it was clear that the limit of supplying monetary accommodation through the standard interest rate tool had practically been reached.

Belke and Klose (2017) study how the room for interest rate manoeuvre worked out at the national level for the first 12 euro area countries, adopting a similar approach for estimating equilibrium real interest rates as Laubach and Williams (2003). They find that after the financial crisis of 2008-2009 the three-month interbank rates corrected for national ex ante or ex post inflation entered into negative territory and fell below their estimates of the national equilibrium real interest rates – although the latter also turned negative after the start of the crisis. Although the confidence bands are too large to draw a firm conclusion, their empirical evidence suggests that, looking at the national level, ECB monetary policy was able to avoid the 'secular stagnation trap' where a surplus of savings can no longer be corrected by cutting the key interest rates. The only exception was Greece, since its equilibrium real interest rate reached a very negative value. Since the end of 2015, equilibrium real rates are estimated to have been slightly positive again for most other member countries.

As from September 2014, the ECB initiated a quantitative expansion of the Eurosystem's balance sheet to deliver the additional monetary stimulus that was thought necessary to counter the risk of sustained low inflation becoming embedded in longer-term inflation expectations (see ECB, 2015). To begin with, it offered two series of targeted longer-term refinancing operations (TLTROs) for up to four years on very favourable terms for banks expanding their private sector credit base (excluding household mortgages). Moreover, it restarted its purchases of covered bank bonds while adding asset-backed securities and then expanded this quantitative easing from March 2015 with large-scale purchases of public sector bonds in the secondary market and from June 2016 with purchases of non-bank corporate bonds in the primary and secondary markets. The asset purchase programme (APP) was restricted to investment-grade securities (with a waiver for government bonds of countries meeting the conditions of an EU/IMF adjustment programme) and was recalibrated a few times to last at least until September 2018; or beyond, if necessary. The principal payments from the maturing APP securities were reinvested for as long as necessary (the public sector bonds in the jurisdiction where they were issued) so as to maintain the corresponding central bank liquidity. This forceful action

confirmed and strengthened the earlier forward guidance that monetary policy was expected to remain accommodative for an extended period of time. The objective of these non-standard monetary policy measures was to further flatten the sovereign yield curve, create positive wealth effects, relax bank funding costs, ease private borrowing constraints, address the frictions in monetary transmission and to provide a major stimulus for credit growth, domestic demand and job creation in order to return inflation to a medium-term path just below 2% on a sustained basis.

The Governing Council of the ECB considered the public sector purchase programme (PSPP) as a legitimate monetary policy instrument provided that sufficient safeguards against monetary financing were made and the sovereign credit risks were not mutualised at the euro area level. Eligible were debt instruments issued by euro area central, regional and local governments, recognised public sector agencies, and European supranational institutions located in the euro area. The allocation of the monthly purchases between euro area countries (so far excluding Greece) was guided by the ECB's capital key (with some flexibility), and not by the proportion of their outstanding debt.[86] Moreover, the Eurosystem observed a black-out period (during which its secondary-market purchases are suspended, also for securities with neighbouring maturities) around the dates when new public sector bonds are issued in the primary market. The total amount of public sector bond purchases was capped at 25% of a given issue (which was raised to 33% as from November 2015)[87] and an aggregate holding limit of 33% per issuer.[88] These ceilings served to preserve market discipline for governments and to safeguard pari passu (i.e. equal) treatment with respect to private creditors.

The PSPP was furthermore subject to a special regime for sharing possible (but unforeseen) losses. Only 20% of any losses on the whole monetary policy portfolio of public sector securities would be fully shared within the Eurosystem. This part covered the ECB's own acquisitions of national government bonds (first accounting for 8% of the total, since April 2016 for 10%), as well as the national central banks' purchases of securities issued by European supranational institutions (initially covering 12% of the total, but 10% since April 2016). Hence, potential losses on the remaining 80% of the portfolio were for the sole account of the national central banks relating specifically to their purchases of public sector bonds of their own country. This special arrangement also reduced possible incentives for sovereigns to default on their debt obligations because in such a situation their own national central bank rather than the Eurosystem would bear the brunt.

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[86] For countries with a low stock of government bonds, substitute purchases of public sector bonds of other jurisdictions as well as European supranational institutions are conducted in order to reach the relevant country's share of total purchases.

[87] The issue limit refers to the maximum share of a single PSPP-eligible security that the Eurosystem was prepared to hold so as to avoid having a blocking minority in case collective action clauses in a government bond contract would be activated in an orderly debt restructuring. The original issue limit of 25% still applies for public debt securities containing a collective action clause that differs from the model used by euro area governments as of January 2013, unless it was confirmed that holding 33% would not lead the Eurosystem to have a blocking minority. For European supranational institutions the issue limit was further raised to 50% in April 2016.

[88] The issuer limit refers to the maximum share of a single issuer's outstanding securities that the Eurosystem was prepared to hold so as to safeguard market functioning and price formation as well as to mitigate the risk of the Eurosystem becoming a dominant creditor of euro area governments. For European supranational institutions the issuer limit was raised to 50% in April 2016.

These provisions notwithstanding, the German Federal Constitutional Court (2017) expressed doubts that the PSPP is compatible with the prohibition of monetary financing, inter alia because the pre-announced monthly purchases gave near certainty to market participants that bonds issued by governments in the primary market would subsequently be bought by the Eurosystem in the secondary market. Given the large volume and the multi-year implementation period inherent in its design, the PSPP could also prove to be disproportionate, in which case it was no longer a monetary policy measure but primarily of an economic policy nature, which is not covered by the ECB's mandate (see Tuori, 2017, for a discussion). In addition, it was uncertain whether the PSPP effectively ruled out risk-sharing within the Eurosystem and the possibility that the German government might be obliged to supply budgetary resources to recapitalise its national central bank. The case brought by German complainants was referred to the European Court of Justice for a preliminary ruling (which at the time of writing was still outstanding).

The combination of negative short-term interest rates and large-scale asset purchases compressed public and private sector bond yields across the term structure because the eligible marketable securities became scarcer while the concomitant expansion of bank reserves injected net safety and liquidity into the economy and extracted net duration. This monetary intervention triggered portfolio substitution into more risky and less liquid assets with longer duration (see Sections 6.6.3 and 6.6.4). Euro area average sovereign bond yields for short to medium-term maturities as a result fell below zero (see Figure 6.17).

Figure 6.17 – Euro area average sovereign yield curve, June 2014 to September 2016

(synthetic yields in percent per annum and maturity in years)
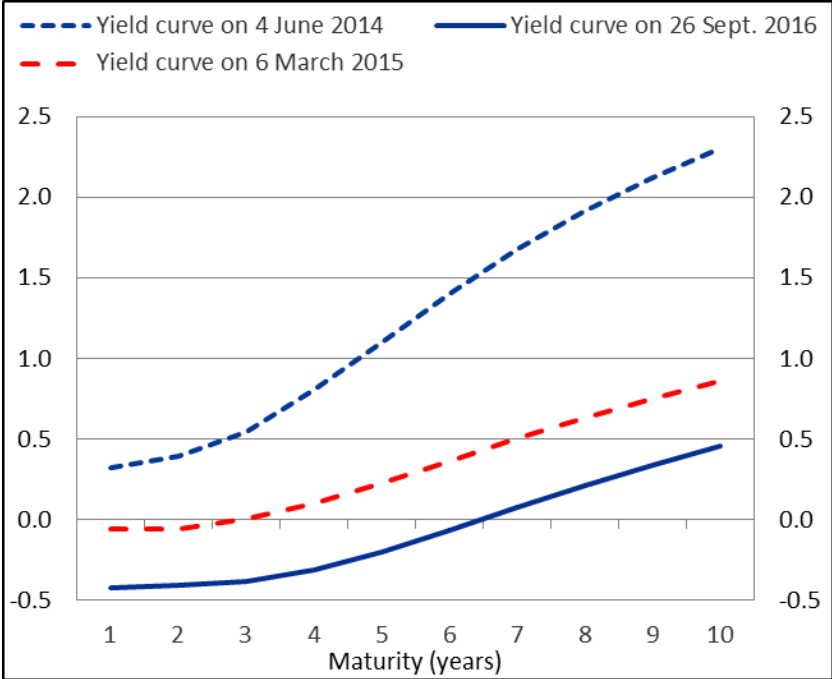
Source: Bloomberg, ECB.

Since all investment-grade public sector bonds of member countries were eligible, the start of the PSPP not only reduced sovereign credit risk in general but also contributed to a significant narrowing of interest rate spreads relative to the German bund, notably for longer durations (see Altavilla et al., 2015). This is visible in the immediate market reaction to the PSPP announcement on 22 January 2015, as the yields on individual government bonds of Italy and Spain declined considerably more than those of German and French bonds, up to twice as much for very long maturities (Figure 6.18).

Figure 6.18 – Changes in yields on public sector bonds of Germany, France, Italy and Spain

(yield changes in basis points on 22 January 2015 during the ECB press conference between 14:30 and 16:00 CET for individual securities at ISIN level by country and year to maturity)
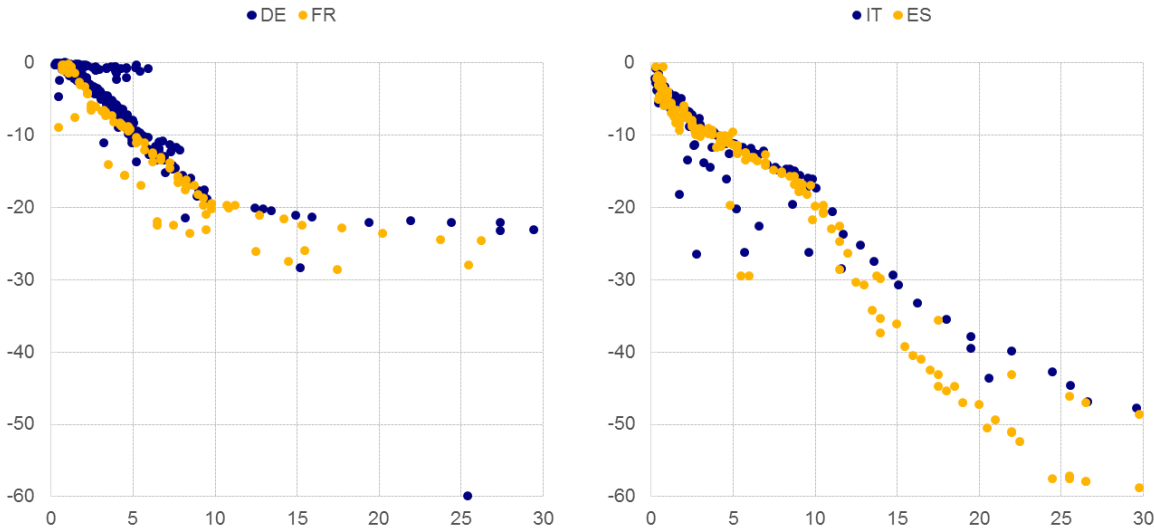
Source: ECB (2017).

As a continuous buyer in the market, the Eurosystem also compressed the liquidity risk premia in public sector bond yields. Other than that it tried to preserve market functioning and smooth price discovery by mostly carrying out a large number of small-scale public sector bond purchases on a daily basis, acting as a marginal buyer and taking account of trading liquidity and market activity. Towards the end of 2016, a growing number of market actors had difficulty raising secured short-term funds because the PSPP as well as the EU's regulatory requirements favouring high-quality and liquid assets reduced the pool of sovereign bonds traditionally used as collateral in repurchase agreements. As a partial solution to this scarcity, the ECB and some national central banks made a modest amount of their acquired government bonds available to interested counterparties for securities lending, also accepting cash as collateral, so as to support bond and repo market liquidity and collateral availability.

Corporate sector bond purchases were conducted on the basis of a market-neutral benchmark that reflected the share of the bonds issued by an eligible company in the nominal value of the whole universe of eligible corporate bonds. Deviations from that benchmark were allowed to take account of the liquidity conditions across individual issuers and bonds and the applicable issuer-specific limits.

The intended and unintended effects of ultra-easy monetary policy

Considering the intended effects, the ECB's substantial monetary stimulus transmitted to financial conditions as expected and succeeded in realising more equal private sector borrowing rates across the eurozone (see also van Riet, 2017c). Although the standard interest rate tool practically hit the effective lower bound, with its non-standard credit easing and asset purchases the ECB contributed to the relaxation of private sector balance sheet constraints that held back credit supply and demand. Empirical studies show that the various announcements of non-standard monetary stimulus measures over the period from June 2014 to December 2015 significantly lowered the bank lending rates offered to non-financial firms and households, with a more pronounced effect seen in the vulnerable euro area countries (Figure 6.15) and benefiting above all banks with less capital, a higher sovereign exposure and more non-performing loans (see Altavilla et al., 2016). As a result, the credit contraction at an annual rate of 1.75% bottomed out in early 2014 and bank lending to the private sector reached a modest growth rate of about 2% by late 2016 (Figure 6.10). The recovery of bank lending was broad-based, covering both households and non-financial corporations, and extended to most if not all euro area countries (Figure 6.16). The earlier cross-country differences in the access to and the cost of credit narrowed and the financial fragmentation of the eurozone receded.

As a result of the central bank liquidity injections M3 growth rose steadily and stabilised at an annual rate between 4½ and 5% (Figure 6.9). Evidence from private sector surveys indicated that the easier monetary policy and relaxation of credit conditions generated expectations of higher output growth and inflation up to two years ahead. Euro area real GDP growth staged a recovery that broadened to comprise most economic sectors and euro area countries, also supported by the depreciation of the euro and positive wealth effects (see Gambetti and Musso, 2017). The gradual but steady decline in the debt-to-GDP ratios of both households and non-financial firms underpinned the sustainability of private consumption and investment as the main drivers of the economic expansion, although further deleveraging was warranted. The improved short-term inflation outlook contributed to a re-anchoring of longer-term inflation expectations (Andrade et al., 2016). The sliding of inflation expectations to a rate well below 2% came to an end in early 2015. After the rate of consumer price inflation had dipped below zero in end-2014 and early 2015, it turned positive in 2016, whereas core inflation remained stagnant at a rate below 1% (Figure 6.7). At the start of 2017, all member countries had moved out of negative inflation and the risk of deflation had largely disappeared.

Several authors warned about the unintended consequences of a sustained highly accommodative monetary stance. The adverse side-effects of a protracted period of abundant liquidity and ultra-cheap credit, with short-term interest rates standing in negative territory and even sovereign bond yields recording negative values over the first part of the term structure, could be manifold. The record-low interest rates could inter alia distort competition and price discovery in financial markets, change the income and wealth distribution, squeeze the profit margins of banks, feed bank disintermediation, undermine the solvency of pension funds and insurance companies, facilitate delays in balance sheet

restructuring in the private sector, create scope for governments to postpone fiscal consolidation and structural adjustment, promote a misallocation of capital, and stimulate a degree of risk-taking that could push asset valuations beyond their fundamentals (for a discussion, see van Riet, 2017c).

Non-standard monetary policy and its fiscal and quasi-fiscal implications

Looking back, the ECB's non-standard interventions in the allocative functioning of capital and credit markets were pervasive and often had a fiscal or quasi-fiscal character. The suppression of the whole euro area term structure of sovereign interest rates in an effort to shadow the declining natural yield curve and squeeze differences in private financing conditions across euro area countries blunted market discipline for borrowers, fuelled risk-taking by lenders and had significant distributional consequences without democratic legitimation. As illustrated below, these three negative aspects highlight the complex relationship between the single monetary policy and national fiscal and financial policies in a situation with unnatural low interest rates around the zero lower bound.

First, large-scale central bank purchases of public sector bonds to steer the sovereign yield curve directly interact with debt management and raise complicated coordination issues with fiscal policy (see Hoogduin and Wierts, 2012). Euro area governments enjoyed a steady reduction in the marginal cost of capital market funding. As discussed in Section 4.3.4, public debt managers took the chance to lengthen the average maturity of outstanding debt so as to entrench the historically low long-term interest rates. Some governments were able to issue public debt at very low interest rates for ultra-long maturities of 30, 50, 70 or even 100 years. As a consequence, public debt management strategies increased the supply of duration risk for investors at a time when the ECB sought to extract it through its public sector bond purchases.[89] Given the institutional set-up of EMU, explicit coordination of national public debt managers with the ECB could not take place.

The single monetary policy also directly benefited debt management of the semi-public sector. State investment banks in euro area countries and the European Investment Bank have assumed a growing role since the crisis in financing public infrastructure, SMEs and other politically favoured borrowers. The EFSF/ESM issued bonds back-to-back to their loans to EU/IMF programme countries and then extended their maturities, in particular for Greece. Being eligible under the PSPP, the Eurosystem bought ever-more bonds issued by these and other recognised public sector agencies and European supranational institutions and in effect partly funded and subsidised their operations.

The ECB's exceptional monetary policy translated into significant budgetary advantages. The successful monetary policy efforts to prevent deflation avoided an undue rise in the real value of public debt. Higher GDP growth and falling unemployment boosted tax revenues as a source of debt service payments and reduced primary (non-interest) expenditure. Government interest payments

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[89] Andrade et al. (2016) examine the changing debt maturity structure during 2015 and conclude that, despite the rising average maturity of newly issued public debt (net of redemptions), the ECB on balance still managed to extract a significant amount of duration risk from the economy.

declined to a low level. The Eurosystem received interest on its growing monetary policy portfolio of public and private sector bonds which allowed many national central banks to make extra remittances to their governments after subtracting the (negative) interest costs on the rising reserve position of the banking sector, although several others used part of the profits to strengthen their financial buffers.

By the end of 2018, the Eurosystem will hold some 20% of GDP in debt securities issued by euro area governments on its balance sheet (covering both the investment and monetary policy portfolios). Tuori (2017) concludes that "[i]n economic terms, the Eurosystem has issued central bank money to become the largest creditor of the Member States. This is monetising government debt, regardless of primary or secondary market purchases". Outstanding EU/IMF loans to the programme countries account for a further 3½% of GDP (see Figure 6.19). Taken together, the official sector will have accumulated more than a quarter of total euro area gross government debt on its books.

Figure 6.19 – Eurosystem and EU/IMF holdings of euro area government debt, 1999-2018
(percent of GDP)
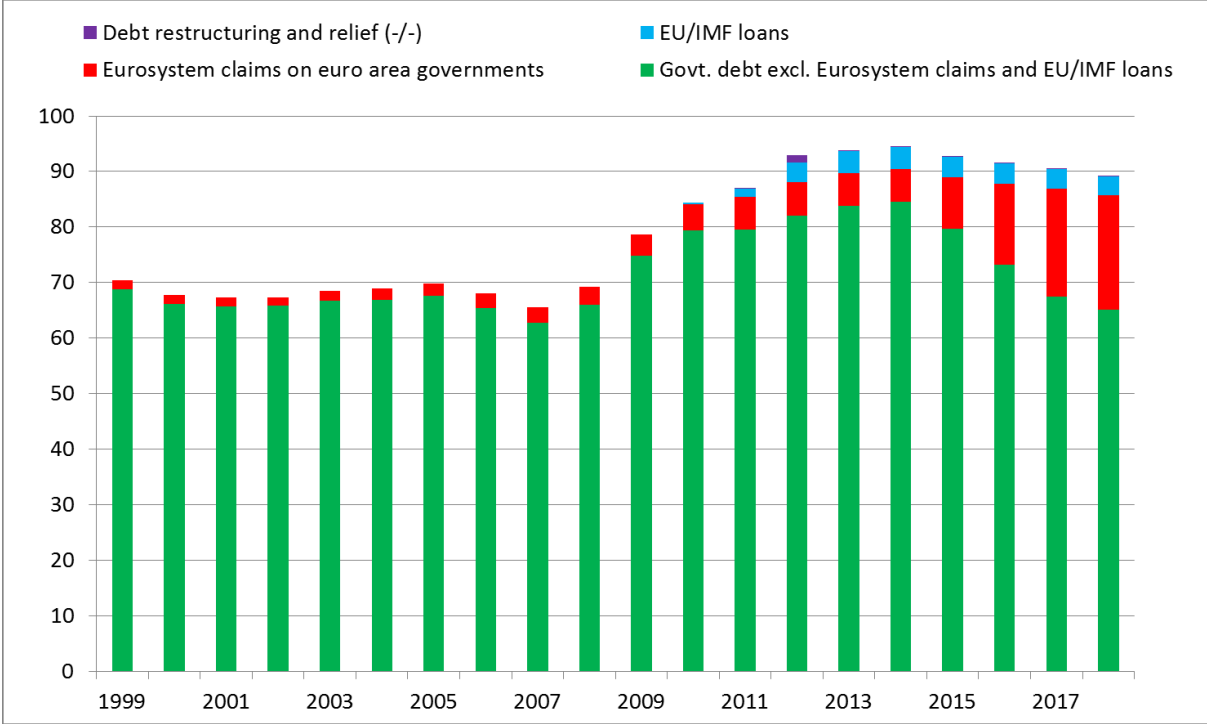
Source: European Commission, ECB and ESM. Data for 2017 and 2018 are estimated.

Notes: Euro area in changing composition, Maastricht definition of consolidated gross general government debt. Debt restructuring and relief refers to the impact of private sector involvement in Greek government debt restructuring in March 2012 and various forms of EFSF/ESM debt relief granted to Greece, Ireland, Portugal and Spain.

The effective fiscal space gained by euro area governments as a result of ECB and other official sector interventions is visible in a steadily declining implicit interest rate paid over the outstanding stock of public debt relative to nominal GDP growth (Figure 6.20), as well as a further improving primary budget balance. Both supportive factors will likely underpin a declining public debt-to-GDP ratio for years to come (see also Deutsche Bundesbank, 2017). At the same time, managing the sovereign yield

curve hampered free market price discovery. The negative money market rate and quantitative easing operations distorted price signals along the entire term structure as well as the information value of national sovereign spreads, which likely weakened market-based incentives for governments to pursue sound public finances and to firmly progress with structural reforms.

Figure 6.20 – GDP growth and implicit interest rate on government debt, 1995-2016
(percent per annum)
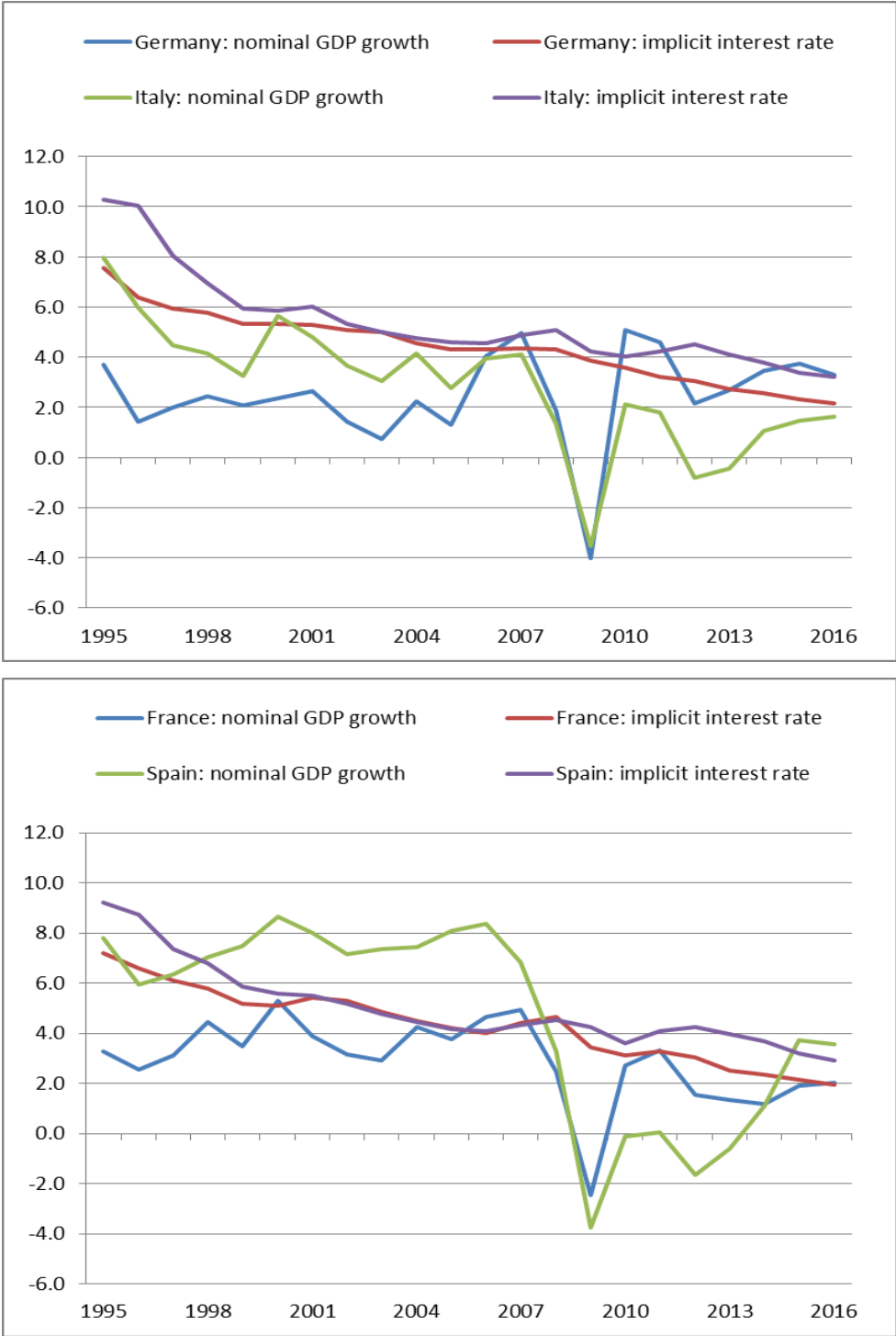
Source: Calculations based on Eurostat data.

The EU fiscal rules of the Stability and Growth Pact (SGP) focus on the structural budget balance and the steadily falling interest bill for euro area countries thus in principle facilitated a faster fiscal consolidation and reduction of public debt-to-GDP ratios. The SGP also constrains government spending growth in excess of trend GDP growth, that is, without taking changes in interest payments and cyclical unemployment benefits into consideration. The euro area countries that still have to meet their objective of a broadly balanced budget over the medium-term can therefore not use the savings from lower interest costs and falling unemployment rates as an argument for stepping up public spending. Several fiscal policymakers nevertheless decided to slow down or reverse the pace of deficit reduction, also making use of the recent more flexible interpretation of SGP requirements. The steady demand from their national central bank for domestic government bonds facilitated public debt issuance and may have undermined fiscal discipline. Ensuring compliance with EU fiscal rules is of paramount importance to guarantee sound public finances in EMU, but gains even more significance when the national central banks take a large quantity of credit risk related to their own government on their books.

Teulings (2016) argues instead that a fiscal expansion is exactly what is needed in the euro area to end a secular stagnation associated with a chronical shortage of domestic demand and that the public debt-to-GDP ratio is sustainable as long as the rate of return on capital (r) stays below economic growth (g), i.e. $r \leq g$. This recommendation ignores that in an uncertain world the public debt ratio may still explode, even if it is expected that $r < g$ (Blanchard and Summers, 2017). Taking a cautious approach, the SGP therefore demands an adequate reduction in the public debt ratio if it stands above 60% of GDP. The objective of returning to sustainable public finances also makes it advisable for euro area governments to take advantage of the exceptional low borrowing costs generated through financial repression and to issue above all longer-term bonds as a fiscal insurance for the future.

Two important conditions for a fiscal stimulus to work are that investors continue to perceive the high and rising stock of public sector bonds as a safe asset and private agents do not respond to the implied higher future tax liabilities by increasing their savings. Although the average interest bill will remain low for quite some time, in the advent of a large negative shock high-debt governments may suddenly be confronted with higher marginal borrowing costs when accessing capital markets. When in addition a considerable part of the banking sector is undercapitalised or requires substantial state guarantees and in addition maintains large claims on their own sovereign, as was or still is the case in vulnerable countries, adding more government debt is likely to crowd out lending to the private sector and reduce the fiscal multiplier (van der Kwaak and van Wijnbergen, 2017). Moreover, the vicious feedback loop between weak governments and fragile domestic banks may return and could lead to financial instability. A fiscal stimulus could be more viable in the strongest member countries but needs to be assessed on its own, national merits instead of undertaken for the reason that interest rates are low.[90]

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[90] On the complex trade-off for euro area countries between macroeconomic stabilisation and fiscal sustainability and their ability to contribute to a positive euro area fiscal stance, see van Riet (2017d, 2018).

A second concern of a protracted period of ultra-low interest rates is associated with what Cecchetti (2016, p.160) calls "the dark side" of monetary policy accommodation. The large injection of central bank liquidity to engineer a very low nominal and real cost of private sector borrowing, accompanied by a depreciation of the currency, encourages financial intermediaries to search for extra yield in more risky markets. An abundant supply of cheap credit and a reduced screening of borrowers could enable private agents to accumulate an unsustainable stock of debt, some of which denominated in foreign currency, which could fuel excess consumption and low-return investments. Although the easing of financial conditions overcomes credit rationing and is the key to lifting output growth and inflation, the risks from overextended private sector leverage for financial stability and the adverse effects of misallocated credit for productivity growth weigh more heavily the longer the central bank maintains its ultra-easy monetary stance (see also Adrian and Liang, 2014; Borio and Zabai, 2016; White, 2016).

Considering the euro area, many financial institutions have assumed more credit and duration risk and bought less liquid assets as they searched for more attractive returns in an environment of very low interest rates. The securities holdings statistics for the euro area show that investment funds in particular, increased the duration of their portfolios. Euro area insurers and to a lesser extent pension funds shifted their assets more towards non-euro area government bonds, corporate bonds with lower credit ratings and illiquid assets such as property and infrastructure (see ECB, 2016).

The net impact of monetary policy on bank profitability was on average modest. Capital gains, lower provisions and higher loan volumes offset the smaller interest rate margins. Euro area banks with a deposit-based funding structure faced downward pressure on their net worth because they were reluctant to pass the negative market interest rates on to their retail depositors and still had to lower their lending rates. Especially those with a smaller equity buffer responded by concentrating their lending business on new, more risky borrowers (see Heider et al. 2017). These high-deposit banks, compared to low-deposit banks, extended more syndicated loans (which represent only a small fraction of total bank lending) to credit-constrained risky firms without charging higher loan spreads, demanding more collateral or setting stricter loan conditions to offset the attendant extra credit risks. Accordingly, the average quality of their syndicated loan portfolios deteriorated. By contrast, banks relying more on market funding and less on deposits gave more syndicated loans to safer borrowers.

Non-bank corporations issuing investment-grade bonds that were eligible for the ECB's corporate sector purchase programme saw a strong decline in yield spreads and took the opportunity to issue more bonds. A broadly similar spread contraction relative to the starting level was observed for bank bonds and 'junk' bonds – even though these two instruments were ineligible – indicating the impact of portfolio substitution. Moreover, equity prices generally increased in the aftermath of this ECB intervention. Hence, the whole corporate sector benefited from lower costs of capital market funding and higher expected profits. Yet, this result also indicated that more risky firms gained access to market credit at lower costs than otherwise. Their relatively strong debt issuance as corporate bond yields declined over the past few years is suggesting that less productive companies may have been

able to survive in contested markets, despite realising a lower return on their assets than their more profitable competitors. Accordingly, the corporate bond purchases distorted the process of price discovery and market adjustment, thereby altering the intertemporal structure of production.

As regards asset price inflation in the euro area, bond prices and share prices (albeit less so for banks) broke earlier record levels in the wake of the ECB's reinforced monetary easing. Housing and commercial property markets in some euro area countries showed relatively strong upward price dynamics in specific regions and segments (also reflecting local factors), which could quickly spread out to other parts. The positive net wealth effects from higher asset prices could evaporate again once interest rates reverse course (see ECB, 2016).

Altogether, the economic recovery enhanced the average capacity of economic agents to bear financial risk. At the same time, their growing exposure to rising interest rates and falling asset prices entailed risks for financial stability and placed a considerable burden on the effectiveness of still experimental macro-prudential policies in Europe. The substantial monetary boost to the euro area economy supported private credit growth but also enabled more fragile debtors to continue borrowing at unprecedented low interest rates from investors in search for higher returns. Although private debt ratios (in most countries) gradually declined, the lack of more forceful market-driven debt resolution prolonged the life of unsustainable economic structures and may also have constrained average pricing power. The Austrian School predicts that this low-quality capital stock will frustrate the recovery of total factor productivity growth going forward. The long phase of unnatural low interest rates would, in this view, have laid the foundations for the next boom/bust cycle in the eurozone.

A third concern with ultra-low interest rates is that the attendant capital gains on financial assets entail a redistribution of income and wealth from savers to borrowers or from the poor to the rich without democratic legitimation. The distributional effects of the ECB's exceptional monetary policy are wide-ranging and work through both financial and macroeconomic channels (see Deutsche Bundesbank, 2016; and Draghi, 2016).

On the financial side, the banking sector was confronted with a tax (at the negative deposit facility rate) on the excess amount of bank reserves that were created, but also enjoyed a subsidy (up to the negative deposit facility rate) on the take-up of targeted longer-term refinancing when exceeding certain private lending benchmarks. The steadily growing excess reserves (and thus the tax) ended up with banks located in the financial centres of core countries without circulating further, since the cross-border interbank market was still fragmented in 'north' and 'south'; whereas the refinancing operations (and hence the subsidy) mostly benefited banks in the periphery countries.

Savers were affected in their financial position as retail deposit holders, as owners of bonds, shares and residential property. Borio and Zabai (2016) observe that positive interest rates are deeply rooted in society reflecting the fundamental role of money as an unremunerated benchmark asset that serves as the unit of account in the economy. Given their positive time preference, households expect to receive a positive interest rate on their saving deposits as compensation for postponing consumption

from the present to the future. A zero interest rate on saving deposits is regarded as unnatural and negative rates are seen as an unfair tax, even when corrected for low (expected) inflation the negative real return they get may be well within normal boundaries given the state of the economy.

Euro area households on balance saw their interest earnings (as a share of their disposable income) decline markedly since 2008. While this triggered a debate on the apparent 'expropriation of the saver' (Bindseil et al., 2015), on average, the interest income of households remained positive and continued to exceed debt interest payments – although the balance between the two was negative for euro area countries where mortgage debt was particularly high. Estimates suggest that the additional monetary easing since June 2014 on average created positive net wealth effects for all household wealth groups, since both bond prices and house prices rose until mid-2016 while equity values fell somewhat. The net benefits were nevertheless larger for the richer households than for families without savings in the form of security holdings or real estate.

Furthermore, the private sector asset purchases favoured some corporations more than others and some politicians saw them in effect as a form of directed credit, since they involved selective acquisitions of investment-grade securities offered in the primary and secondary market at a certain point in time. Members of the European Parliament asked that the Eurosystem take social considerations and environmental concerns into account when buying corporate bonds. This request was rejected as burdening monetary policy with additional tasks outside its mandate, although it did lead the ECB to publish the list of corporate securities that had been bought.

The distributional effects of ultra-low interest rates can also be found on the macroeconomic side. The monetary expansion helped to improve corporate profitability and the conditions for job creation. The brighter labour market situation reduced the risk of unemployment above all for low-skilled, poorer households and supported their future income. These were also the liquidity-constrained households with a relatively high marginal propensity to consume. The extra tax revenues associated with the economic recovery in principle offered scope for lower marginal tax rates. Finally, the fight against too low inflation countered an arbitrary redistribution of wealth between generations, since unexpected deflation would raise the real value of debt and the young were net debtors whereas the old were net creditors.

Overall, the apparent success in reflating the euro area economy and heading off the risk of a secondary debt-deflation spiral was due above all to favourable wealth effects and the easing of financial conditions as a drawn-out balance sheet recession bottomed out. To achieve this positive result, the ECB's unconventional monetary policies suppressed the euro area average sovereign yield curve as well as the interest rate spreads of the vulnerable euro area countries relative to those in the stronger member countries. The downward convergence seen in the interest rates of the vulnerable countries was achieved by monetary policy actively extracting market-based sovereign risk which effectively amounted to financial repression. For the core countries the ultra-low cost of funding engineered by the ECB was hardly warranted as interest rates were already very low and liquidity was

abundant thanks to safe haven flows. As highlighted by Austrian School, the further credit expansion could only amplify the conditions for asset price inflation and an unproductive capital structure.

Minenna (2016) expresses the fear that the return to a single sovereign yield curve is not sustainable. He proposes that the ECB adopts a "zero-spread target" for monetary policy in order to prevent that market volatility again leads to a widening of sovereign spreads with adverse side-effects for monetary transmission and vulnerable countries. Governments would in return have to strengthen their economies and the EMU architecture. However, monetary policy would become even more intertwined with public debt management and drag the ECB into government bond market activity in a way that the Maastricht Treaty set out to avoid (see also Hoogduin and Wierts, 2012).

The more a central bank appears willing to intervene in capital and credit markets, the more it could come under pressure from politicians to prolong its unconventional monetary policy and the more critical they will see an exit, given the possibility to direct credit at affordable costs to favoured destinations (Borio, 2014). High-debt governments may favour the reinvestment of public sector bonds as they mature and push the central bank to cap an increase in sovereign bond yields, for example, in response to rising political risk around the time of national elections. Unconventional monetary policies also draw public attention for their relatively large distributional effects (de Haan et al., 2017). Country-specific deviations from the ECB's capital key in the flexible execution of national government bond purchases were therefore followed with great interest. Furthermore, the exposure of the Eurosystem to financial losses on downgraded corporate bonds met with concerns. These fiscal and quasi-fiscal aspects surrounding the unconventional monetary measures serve to demonstrate that ultra-low interest rates and an outsized balance sheet may have political consequences.

6.8   Assessment and conclusion

Over the past decades, nominal and real interest rates in the major advanced economies have fallen from their historical peaks around 1980 to historical lows in 2016. This remarkable phenomenon has recently been ascribed to secular stagnation, i.e. a chronic shortfall in aggregate demand marked by a very low or negative neutral real interest rate which complicated central bank efforts to realise full employment through conventional measures of monetary relaxation. Alternatively, the emergence of unnatural low interest rates may be related to an easing bias in monetary policy, in particular through the application of financial repression techniques that also enable cheap government funding. This chapter contributed to the literature by offering a systematic comparison of these two opposite views.

During the Great Moderation many central banks operating with a flexible exchange rate (implicitly) used a monetary policy reaction function (known as the Taylor Rule) that seeks to achieve a short-term interest rate equal to the neutral rate that is expected to maintain a balanced economy with low and stable inflation. Few central banks still paid attention to the information value of money and credit and in their focus on price stability they shunned a 'leaning against the wind' of asset price inflation. After the global financial crisis, this short-term interest-rate targeting met with the constraint of the zero (or

effective) lower bound. To overcome this barrier, the traditional monetary policy rate was extended with forward guidance and unconventional measures like substantial credit easing and large-scale asset purchases in order to exercise more direct control over financing conditions in the fight against a credit crunch, low inflation and sluggish output growth. The corresponding adoption of the sovereign yield curve as a de facto operational target for monetary policy appears to reflect efforts to address secular stagnation in a low interest rate environment.

This chapter showed that the new central bank practice of expanding the balance sheet and managing the yield curve comes close to the US case of a constrained monetary policy during and after the Second World War, when the Fed was subject to the instructions of the Treasury. A monetary policy subservient to public debt management, forced to cap the cost of government borrowing and spur output growth while monetising sovereign debt and accommodating inflation, is characteristic of financial repression. Maintaining a too low interest rate for long also stimulates excessive risk-taking by bank and non-bank lenders and the build-up of unsustainable debt positions which endanger financial stability and place an undue burden on the micro- and macro-prudential authorities.

As stressed by the Austrian School, suppressing the market interest rate below its natural free market value leads to an abundance of cheap credit which will translate into overconsumption and malinvestment, both in the private sector and the public sector. The distorted intertemporal production structure is unsustainable and will have to be corrected at the next cyclical downturn. This warrants the conclusion that repeated episodes of financial repression of monetary policy rates, when connected with the Austrian business cycle theory, provides a plausible alternative explanation for the trend decline in market interest rates.

With this basis insight, this chapter reviewed the Austrian features of ECB monetary policy since its inception in 1999 until 2016 and compared it with secular stagnation as the driving factor behind the decline to record-low interest rates in the euro area. The ECB consistently focused on its euro area mandate of maintaining price stability. However, the pre-crisis success in maintaining low and stable consumer price inflation at the euro area level was unsustainable in a situation of diverging member countries with growing Austrian-style imbalances fuelled by credit-driven capital inflows in search for higher yields. The monetary pillar of the ECB's strategy and the nature of credit growth received less prominence in those days than with the benefit of hindsight it should have had.

During the evolving euro area crisis the ECB ended up applying unusual monetary policy tools directed at the crisis-hit countries to provide sufficient liquidity and repair broken monetary transmission channels to counteract a credit crunch and secular stagnation. Although euro area governments also took stabilisation measures, they came to rely on the Eurosystem to do whatever it takes in national sovereign bond markets to safeguard the euro. The ECB's crisis interventions and the monetary efforts to establish more affordable borrowing rates also contributed inadvertently to delaying the necessary reallocation of resources, as the Austrian School would predict, which in turn also held back the recovery of price and wage developments.

As financial markets calmed down but inflation expectations started sliding down, ECB monetary policy turned to fighting low inflation in the euro area. Money market rates were moved slightly into negative territory and the ECB's credit and quantitative easing measures combined with forward guidance engineered a substantial decline in euro area average longer-term interest rates as well as a flattening of the sovereign yield curve. The single monetary policy was successful in easing financing conditions and reflating the euro area economy, which taken on its own may be regarded as an effective response to secular stagnation.

However, the large-scale asset purchases, comprising in particular public sector securities, also extracted sovereign risk at the country level and further narrowed the spreads between government bond yields relative to Germany. Also private sector interest rate spreads on bank lending and market credit were brought back close to their pre-crisis levels. These narrow interest rate differentials could turn out to be unsustainable when the single monetary policy reverses course, to the extent that after 10 years the economic and financial imbalances prevailing in 2008 have only partly been corrected.

One could argue that the ECB had to apply financial repression techniques to achieve this non-market conform interest-rate convergence to a common low level, which especially favoured debtors in the vulnerable countries. By contrast, the market interest rates in safe-haven countries were already very low and the exceptional monetary easing only pushed them into unnatural negative territory. The Austrian School predicts that this suppression of interest rates will create a distorted production structure, fuel asset price inflation and trigger another unsustainable economic and financial boom which in the longer run will unavoidably turn to bust.

A more appropriate macroeconomic and financial policy mix for EMU would have required a closer coordination between the euro area member countries to contribute with sound and sustainable fiscal policies, a growth-friendly composition of public finances, more decisive structural reforms in labour, product and housing markets, and a faster resolution of non-performing bank loans, corporate insolvencies and overextended household mortgages. A focus on strengthening the supply side of the economy could have speeded-up balance sheet repair, accelerated the output recovery and promoted higher productivity growth, thereby supporting an earlier reversal of the very low interest rates. However, the institutional architecture of EMU lacked effective tools to secure this preferred outcome.

As a result, the single monetary policy was the 'only game in town' and the reintegration of financial markets and the euro area recovery came to depend on the ECB maintaining its accommodative monetary stance until the euro area governments had found a politically acceptable joint way forward to strengthen the EMU architecture, address the legacy of the crisis and ensure sustainable economic and financial convergence. With the ECB in this uncomfortable position, the risk of political dominance over monetary policy can be said to arise from governments' *lack of political action* rather than from political activism. The willingness of the ECB to stretch monetary policy to the limit of its mandate may even have contributed to this political stalemate and could ultimately undermine its monetary credibility and public support for its political independence.

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7. Empirical findings for the euro area average cost of government borrowing

… markets for government bonds are increasingly populated by nonmarket players, calling into question the information content of bond prices relative to their underlying risk profile – a common feature of financially repressed economies. Reinhart and Rogoff (2011, p.35).

7.1 Introduction

This chapter undertakes a first step into an econometric analysis of the secular decline in the euro area average cost of government borrowing, concentrating on the potential role of three main public policy tools of modern financial repression: public debt management, EU prudential legislation and ECB monetary policy. The purpose of the analysis is to assess whether variables representing these three public policies, taken on their own, can be associated with the downward path in the euro area average long-term interest rate over the period 1996-2016. If confirmed, such a finding would cautiously suggest that the interventions had intended or unintended effects on capital markets which are equivalent to those under financial repression, i.e. helped to further lower the effective interest rate paid by euro area governments despite their high and rising aggregate public debt-to-GDP ratio.

The euro area average under consideration comprises the first 12 countries participating in EMU. Given the unavoidably short time span that can be studied and the constraint of annual data, this study takes a bivariate analysis to be the only econometrically sound approach and it stops short of venturing into a multivariate analysis. Even a cross-section analysis of the 12 countries would face serious data limitations since the euro area crisis marks a clear break with the pre-crisis history.

To inform the empirical analysis, Section 7.2 discusses the trend decline in the euro area cost of government financing and its relation with falling market interest rates and the changing stock and composition of euro area government debt relative to GDP. Section 7.3 lists the explanatory euro area variables used in the empirical analysis. Section 7.4 presents a bivariate econometric analysis of the euro area average long-term bond yield and an equation for the implicit interest rate. Section 7.5 concludes and considers options for future research.

7.2 The secular decline in the euro area average cost of government borrowing

Euro area governments have enjoyed a substantial decline in debt interest payments since the mid-1990s when their joint interest bill stood at nearly 5.5% of GDP (Figure 7.1). Long-term government bond yields initially fell rapidly in connection with the convergence criteria that member countries managed to fulfill before adopting the euro, even though the aggregate public debt-to-GDP ratio decreased only modestly. After the start of EMU in 1999, the strong incentive of having to meet the convergence criteria for sound public finances disappeared and was replaced by EU fiscal surveillance to complement market-based fiscal discipline, both of which were hardly effective in practice. The common fiscal rules were not strictly applied and market participants seemed to assume that a distressed member country would simply (have to) be bailed out by its partner countries or by the ECB, despite the no-bail rule and the ban on monetary financing laid down in the Maastricht Treaty.

National public debt managers were able to sell euro-denominated sovereign bonds that were not only labelled in EU banking regulation as entailing zero credit risk but also perceived as such by market actors. As global interest rates declined, an increasing group of foreign investors from other euro area countries as well as from outside EMU searched for higher yields across the single currency area, absorbing a growing proportion of government debt from all eurozone countries (Figure 7.1) paying little if any attention to the fundamental economic differences between them. These substantial debt-based capital flows were facilitated by the EU's preferential regulatory treatment of sovereign debt denominated and funded in the euro. Given these misaligned incentives, the euro area government debt ratio saw hardly any further decline in the first years of EMU, despite a generally supportive macroeconomic environment. Yet, the ratio of interest payments to GDP continued declining.

Figure 7.1 – Euro area government debt and interest payments, 1995-2016

(percent of GDP)
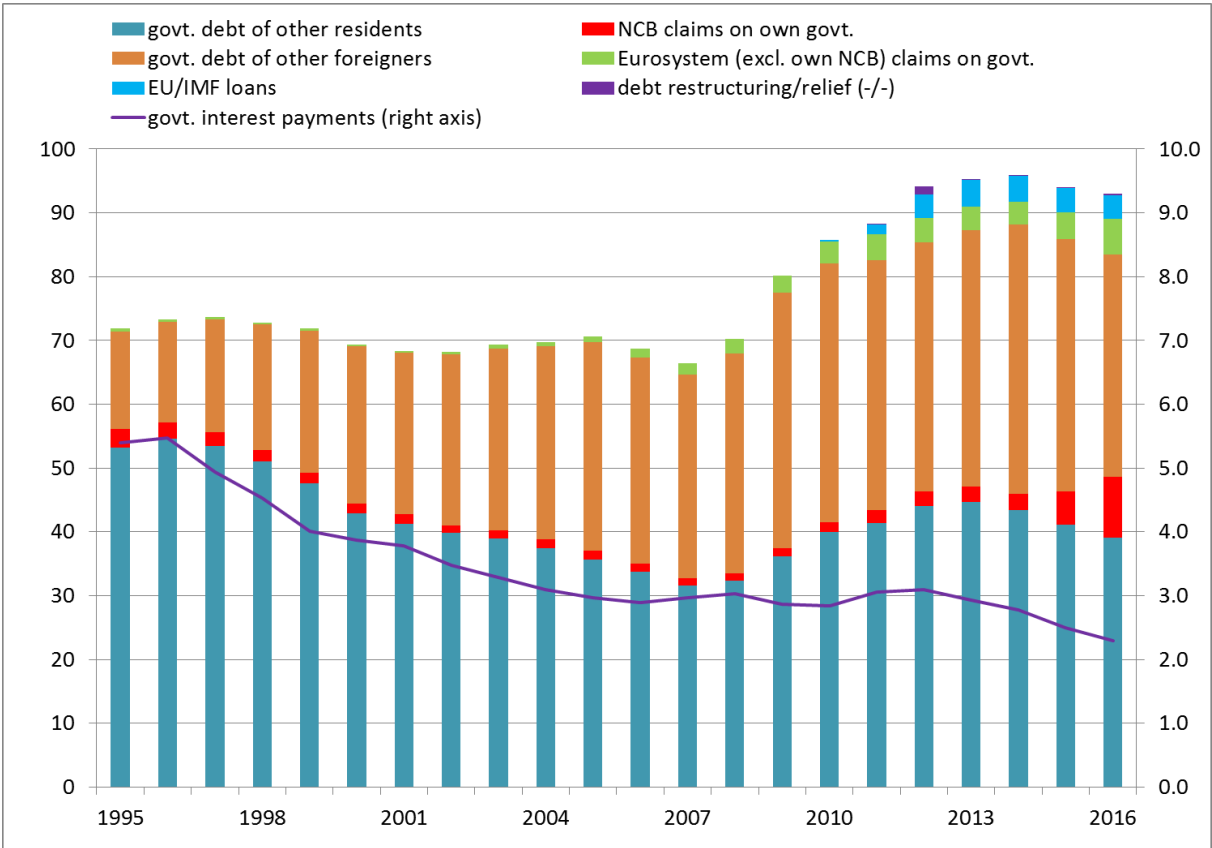
Source: Eurostat and ECB. Euro area comprises the first 12 member countries.

Note: Euro area government debt corresponds to the Maastricht definition and is therefore defined in gross terms and consolidated across general government. The concept of resident/foreign owners of debt applies at the national level.

Following the financial crisis in 2008 the government debt-to-GDP ratio for the euro area jumped to much higher levels, reaching a peak in 2014. When in some vulnerable member countries the sovereign debt crisis broke out, foreign investors retreated to their home base and public debt managers became more reliant again on domestic audiences to (re)finance government debt at a sustainable interest rate (Figure 7.1 and Chapter 4). EU/IMF financial assistance at concessional

interest rates, European debt relief and the Greek debt restructuring as well as the Eurosystem's outright and committed interventions in volatile sovereign bond markets also played a significant role in making their much higher public debt ratios affordable (Chapters 5 and 6). By contrast, the safe-haven countries benefited from capital inflows and much lower market interest rates. Most of these crisis-related interest rate effects occurred within the eurozone, leaving the aggregate interest burden almost unaffected. After 2012, as the volatility in sovereign bond markets abated, the total bill of interest payments of euro area governments resumed its long-run decline, supported by the ECB's monetary easing policy, to 2.3% of GDP in 2016 (Figure 7.1).

A shift in the maturity composition of debt towards fixed-rate longer-term government bonds, smooths out the time profile of gross refinancing needs, reduces a country's vulnerability to sudden changes in market sentiment and gives it more certainty over future interest payments. Before joining the euro, many prospective member countries reduced their reliance on short-term debt, seeking to entrench the decline in long-term yields by shifting towards issuance of longer maturities (see Figure 7.2). As a result, the government debt to be rolled over shortly (within one year), which includes short-term debt as well as maturing long-term debt, declined and the average residual maturity increased accordingly. This secular movement was interrupted when monetary policy rates were lowered after 2001 but then continued after short-term rates went up again and the yield curve flattened as from the mid-2000s.

Figure 7.2 – The maturity profile of euro area government debt, 1995-2016

percent of GDP on the left axis, years on the right axis)
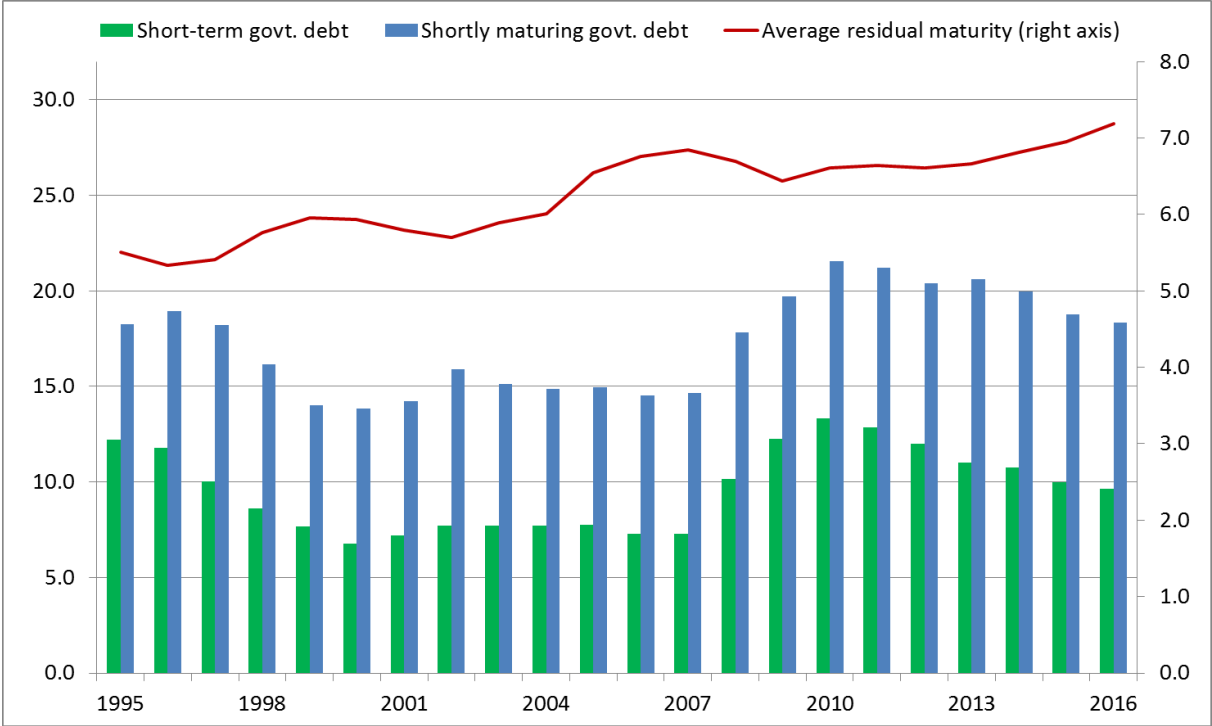
Source: Eurostat and ECB. Euro area comprises the GDP (PPS) weighted average of the first 12 member countries.

Note: The figure shows short-term government debt with an original maturity of up to 1 year, shortly maturing government debt with a residual maturity of up to 1 year, and the average residual maturity of non-consolidated government debt in years.

The large-scale bank rescue operations that had to be undertaken in late 2008 caused many euro area governments to finance this unexpected financial support with relatively cheap short-term debt. After 2010, however, the weight of short-term funding in total debt has steadily fallen, reducing the amount of debt maturing in the near term (Figure 7.2). Especially after 2012, national public debt managers took advantage of the rapidly falling long-term interest rate and flattening yield curve engineered by the substantial monetary accommodation of the ECB to further lengthen the average maturity of government debt, which in 2016 stood somewhat above seven years.

The implicit interest rate effectively paid by euro area governments on their outstanding debt (calculated by dividing the government's interest payments by the stock of debt outstanding at the end of the previous year) is a 'lagging' variable, because current market interest rates are reflected only when debt has to be rolled over at maturity and additional budget deficits have to be financed. Also, the share of government debt subject to a variable interest rate is small in the euro area. The euro area implicit interest rate steadily decreased from almost 8.5% in the mid-1990s to 2.5% in 2016 (see Figure 7.3). This secular decline mirrors the overall reduction in the short-term interest rate as well as the downward trend in the long-term bond yield, similar to the path observed in many other advanced economies. As noted above, changes in the composition of government debt by maturity and the relative importance of national, foreign and official debt holders were also of influence.

Figure 7.3 – Euro area market interest rates and the implicit interest rate on debt, 1995-2016
(percent per annum)
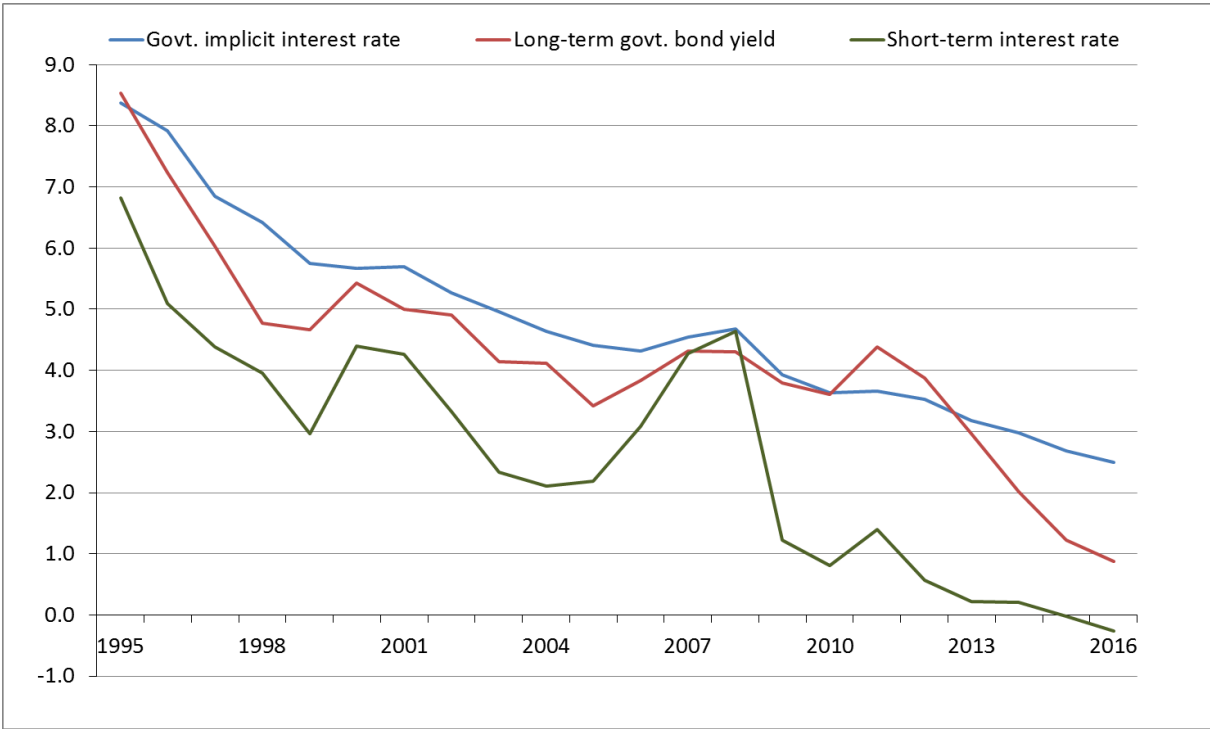
Source: Eurostat, ECB and Reuters. Euro area comprises the first 12 member countries.
Note: The long-term government bond yield is for a 10-year maturity, the short-term interest rate is the three-month Euribor.

7.3 Euro area variables explaining the government bond yield

The reasons for the secular decline in market interest rates have been the subject of much academic debate (see also Chapter 6). To better understand this downward trend, in particular its relation with the public policy tools of financial repression, the euro area average yield on sovereign bonds can be associated with the following three sets of explanatory variables (see Table 7.1 for their description and sources and Table 7.2 for their statistical properties).

First, ECB standard monetary policy anchors the *short-term interest rate* which reflects expectations of future output growth and inflation and in turn positively influences the sovereign bond yield for the euro area. This forward-looking perspective indicates that, alternatively, also the explanatory power of the *trend in nominal GDP growth* could be tested as a simple proxy for the euro area economic outlook that is relevant for monetary policy and the long-term interest rate.

The short-term market rate alone will not suffice to capture the full effects of the single money policy. As discussed in Chapter 6, the ECB's key interest rates are constrained by the effective lower bound. This is due to the fact that economic agents always have the option to change their financial holdings into cash, should the market interest rate drop significantly below zero. Over the period 2007 to 2016 the standard monetary policy rates have therefore been complemented both by forward guidance and non-standard monetary policy actions, which have also contributed to easing government funding conditions in the wake of the financial and sovereign debt crisis and the low-inflation episode. As a measure of the overall monetary stance, the bivariate analysis in this section also employs a *short-term shadow interest rate* as constructed for the euro area by Krippner (2016). This variable turns negative already in January 2012 and reaches an annual average of -6.1% in 2016 (as depicted in Figure 6.6).[91]

The Eurosystem holds euro area government loans and securities on its books, since the start of EMU for investment purposes, since 2010 also for monetary policy purposes. The amount fluctuated between 1.5 and 3% of GDP between 1999 and 2007 and then rose to just over 6% of GDP in 2014, mainly on account of the SMP. With the implementation of the PSPP the *Eurosystem's sovereign debt portfolio* rapidly expanded to more than 15% of GDP at the end of 2016 (see Figure 7.1). Testing the separate impact of this determinant on the euro area long-term interest rate goes beyond the available empirical event studies linked to the ECB's announcement of the SMP and later the PSPP.

All three monetary policy indicators above are assumed to be independent variables the path of which is determined by the economic outlook. As a note of caution, their behaviour may also be a function of the level of the long-term interest rate and the position of the yield curve to the extent that these are employed as operational targets for monetary policy. This mutual correlation could bias the estimated coefficients of the three monetary policy variables and their impact on the long-term interest rate.

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[91] The short-term interest rate is spliced on Krippner's shadow short-term interest rate in mid-2007. As explained by Krippner (2016), his shadow rate is computed by estimating the price of the cash option from a yield curve model and subtracting it from the observed short-term interest rate, which is truncated at the zero lower bound. For the euro area, he derived the shadow short-term rate from the euro area overnight indexed swap yield curve out to 30 years.

Table 7.1 – Euro area variables: description and sources

Euro area variable (for first 12 members)	Description	Source
Government implicit interest rate	Government interest payments including swaps and floating-rate agreements in % of government debt of previous year	European Commission (AMECO)
Long-term government bond yield	GDP-weighted geometric mean of long-term interest rates of euro area countries used for convergence purposes, 10-year maturity, annual average in %	ECB (Statistical Data Warehouse), European Commission (AMECO)
Short-term interest rate	Three-month EURIBOR, annual average in %	Reuters
Short-term shadow interest rate (spliced)	Short-term interest rate spliced on short-term shadow interest rate from mid-2007, annual average in %	Reuters and Krippner (2016)
Nominal GDP	Gross domestic product at market prices, in mln. euro	European Commission (AMECO)
Government debt	Government debt, Maastricht definition, nominal value in mln. euro at year-end	European Commission (AMECO)
Government debt held by residents	Government debt held by residents from national perspective of euro area countries, Maastricht definition, nominal value in mln. euro at year-end	ECB (Statistical Data Warehouse), Eurostat
Government debt held by foreigners	Government debt held by non-residents from national perspective of euro area countries, Maastricht definition, nominal value in mln. euro at year-end	ECB (Statistical Data Warehouse), Eurostat
Government debt held by Eurosystem	Government loans and securities of euro area countries held by the Eurosystem, nominal value in mln. euro at year-end	ECB (Statistical Data Warehouse)
Government debt held by EU/IMF	EU/IMF financial assistance to GR, IE, PT, ES, including EFSF and bilateral loans	ECB (internal sources)
European debt relief; and Greek debt restructuring	Budgetary savings for the euro area programme countries from concessional terms on EFSF/ESM loans; Greek government debt reduction in net terms due to private sector involvement in debt restructuring in March 2012 plus estimated return to Greece of ANFA/SMP profits accruing to the Eurosystem	ESM (2017, p.49), and this thesis, Table 5.3; ECB (internal sources)
Short-term government debt	Government debt with original maturity of up to 1 year, not consolidated, nominal value in mln. domestic currency/euro at year-end	ECB (Statistical Data Warehouse), Eurostat
Shortly maturing government debt	Government debt with residual maturity of up to 1 year, not consolidated, nominal value in mln. domestic currency/euro at year-end	ECB (Statistical Data Warehouse), Eurostat
Government interest payments	Government interest payments including swaps and floating-rate agreements, nominal value in mln. euro	European Commission (AMECO)
Average residual maturity	Average residual maturity of government debt, non-consolidated, end of period, in years	ECB (Statistical Data Warehouse), Eurostat
Government funding privileges in EU law, de jure	Composite index of government funding privileges in EU prudential law, calculated for de jure application, normalised to the range 0-1	van Riet, this thesis, Section 5.4
Government funding privileges in EU law, de facto	Composite index of government funding privileges in EU prudential law, also calculated for de facto announcement before de jure application, normalised to the range 0-1	van Riet, this thesis, Section 5.4

Table 7.2 – Euro area variables: statistical properties, 1996-2016

Euro area variable (for first 12 members)	Mean	Std. Dev.	Min	Max
Government implicit interest rate (%)	4.629	1.411	2.502	7.920
Long-term government bond yield (%)	4.044	1.463	0.880	7.230
Short-term interest rate (%)	2.435	1.762	-0.265	5.088
Short-term shadow interest rate (spliced) (%)	1.569	3.000	-6.156	5.088
Nominal GDP, annual growth rate (%)	2.971	1.952	-3.467	5.302
Government debt to GDP (%)	77.813	9.983	66.905	93.900
Government debt held by residents to GDP (%)	43.905	6.844	32.927	57.371
Government debt held by foreigners to GDP (%)	34.521	10.888	16.008	50.074
Government debt held by Eurosystem to GDP (%)	4.190	3.273	1.520	15.236
Government debt held by EU/IMF to GDP (%)	1.013	1.680	0.000	4.190
Short-term government debt to GDP (%)	9.502	2.108	6.791	13.332
Shortly maturing government debt to GDP (%)	17.326	2.649	13.852	21.575
Government interest payments to GDP (%)	3.383	0.809	2.303	5.507
Average residual maturity (years)	6.313	0.539	5.332	7.188
Government funding privileges in EU law, de jure, index 0-1	0.313	0.048	0.274	0.408
Government funding privileges in EU law, de facto, index 0-1	0.342	0.089	0.271	0.547

Second, the favourable influence of sound public finances on sovereign bond yields is visible most directly in credible efforts to contain the *total stock of government debt* relative to GDP, which should reduce the credit risk premia in long-term rates. The response of bond yields to the government debt ratio represents in this regard a channel through which market discipline affects fiscal policy.

A similar argument can be made for the part of *government debt held by foreigners*, assuming that non-resident investors are more attentive to sovereign risk than domestic audiences. Following this interpretation, governments need to demonstrate sound fiscal policies in order to maintain access to international capital markets at affordable interest rates. The opposite effect should instead be expected when the 'global savings glut' that became apparent in the mid-2000s has triggered a global search for safe investments (see Turner and Spinelli, 2012, 2013). A high demand for safety from outside the euro area could have lowered the costs of government borrowing for all member countries in line with the global trend. As explained in Chapter 4, the related foreign capital inflows looking for a safe destination favoured the core countries of the eurozone, which the local banking sector before

the 2008 crisis in turn intermediated in the form of net portfolio and other financial investments to the periphery countries, including their sovereigns.

Yet, Chapter 4 also concluded that the large and growing foreign ownership of national government debt made EMU members vulnerable to adverse shocks, as became clear in 2010-2012 when crisis-hit countries were confronted with substantial capital flow reversals. At that point, it was of vital interest for their governments to have a domestic investor base able to step in and stabilise sovereign bond markets. This stabilising demand could be triggered naturally by carry trade and other economic incentives but could also be engineered through regulatory pressure or moral suasion and other forms of financial repression affecting captive resident investors (see Box 3.1 and Section 4.4.1). A 'home bias' in favour of domestic government bonds has emerged in particular for the crisis-affected member countries with their domestic financial institutions building up large claims on their own government (see Section 4.2.3). This should have contributed to easing government funding constraints. A growing national sovereign exposure resulting in a rising stock of *government debt held by residents* could therefore go along with a declining long-term interest rate. This interpretation would be in line with the study of Escolano et al. (2011) for developing economies. They find that the more closed the capital account and/or the more repressed the financial system, the lower the real implicit interest rate paid on public debt.

As additional crisis-related factor, the EU and IMF stepped in with financial assistance as from 2010. Their *official loans* to member countries without access to capital markets should be expected to have a stabilising influence on the affected euro area government bond markets.

Chapter 4 also mentioned that public debt managers in Europe tend to pursue a combination of cost-minimisation and risk-reduction strategies and often seek to supply a given amount of sovereign debt at the longest possible maturity and against the lowest overall cost of funding (Hoogduin et al., 2011). Assessing the relative costs of short versus long-term funding at each point in time, they tend to reduce the amount of *short-term debt outstanding* in favour of longer-term debt to limit the government's exposure to roll-over risk and a tighter monetary stance, which could give them a reward in terms of lower bond yields for reducing this vulnerability.

Finally, the global financial crisis and the subsequent tightening of financial legislation since 2008 has substantially increased the 'mandated demand' for safe and liquid assets, in particular government bonds, with a dampening effect on their return. As observed by Bernanke (2015):

> "Changes in regulation and market practices also affect the demand for safe, liquid assets, such as Treasury securities, lowering their term premiums. For example, new regulations require banks to hold ample liquidity and securities dealers to post more collateral in derivatives transactions. Insurance companies and pension funds also face rules that effectively require them to hold significant amounts of safe, longer-term bonds. This mandated demand seems likely to put downward pressure on longer-term yields for the foreseeable future."

As explained in Chapter 5, the long-standing *government funding privileges in EU financial law* have made it easier for euro area public debt managers to fund their own sovereign on almost as favourable terms as those enjoyed by the most stable EMU members. The broadening base of this preferential regulatory treatment of sovereign funding after 2008 should have motivated affected financial investors to adjust their portfolios and include more public sector bonds relative to private sector securities. For forward-looking capital market participants the constructed de facto index of government funding privileges, which in addition to a score for the formal regulatory changes also includes a score for anticipated changes, à priori appears to be more relevant than the de jure index.

7.4   Discussion of empirical results

The euro is still a relatively young currency and economic and financial variables spanning the whole eurozone cover less than 20 years. This short period hampers any multivariate empirical analysis of the costs of government borrowing in the euro area as a whole. While for financial market variables higher frequency data could be used, these do not exist for some important explanatory variables like total government debt and its composition for which only annual data are available. Some empirical studies try to solve this data limitation by extending the time series back in history to cover a longer period encompassing euro area averages of relevant variables by aggregating over member countries that participated in the European Exchange Rate Mechanism (ERM). Doubts may be raised over the appropriateness of this procedure because the ERM was no monetary union; it was beset by severe exchange rate crises in 1992 and 1993, whereas before 1994 many of the participating countries still maintained capital restrictions. At best, one could start the empirical analysis as from the mid-1990s, when bilateral exchange rates stabilised and prospective euro area countries undertook serious efforts to achieve economic convergence in a context of open capital markets.

Another constraint for a sound empirical analysis of the secular decline in government borrowing costs is that many of the EMU-wide variables discussed in Section 7.3 show an upward or downward trend. The Augmented Dickey-Fuller (ADF) procedure tests for the null hypothesis (H0) that the time series under consideration contains a unit root (i.e. a random walk with or without drift) or the alternative hypothesis that it follows a stationary process. The output of the test corresponds to a linear regression on the first difference of the time series on its one-period lagged level, lagged first difference, the constant and/or the trend of the series. The test statistic from applying this procedure to each of the main euro area variables discussed in Section 7.3 indicated that the null hypothesis of a unit root could be rejected at the 10% or 5% significance level, with the exception of the short-term shadow interest rate, the government debt held by the Eurosystem relative to GDP, and the two variants of the index of government funding privileges.

As a complement to the ADF test, the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedure tests for the opposite null hypothesis (H0) that the time series is stationary around a deterministic trend (or level), against the alternative hypothesis that it is non-stationary. Applying the KPSS test to the euro area variables with a maximum of two lags indicates that for the short-term shadow interest rate, all

the government debt-to-GDP ratios, and the two indices of government funding privileges, the null hypothesis has to be rejected using the 5% critical value, i.e. these euro area variables appear to be non-stationary. According to the literature, however, the KPSS test tends to reject the null hypothesis too often. This outcome suggests that at least the four variables identified by both the ADF and the KPSS tests could be non-stationary and in multivariate regressions would rather need to be included as detrended variables and/or in first differences. At the same time, their non-stationarity may also stem from a small sample problem.

Similar trend-like patterns in the time series may also indicate that the variables in a multivariate regression are affected by multicollinearity with serial correlation in which case the parameters of the equation are less precisely estimated. Table 7.3, showing the pairwise correlations among the main euro area variables employed in this study, confirm this conjecture. Moreover, a marked change in behaviour occurred for many time series around 2008, i.e. the start of the euro area crisis period; for example for government debt relative to GDP, as visible in Figure 7.1. Even a cross-section analysis based on a panel of euro area countries would face major difficulties in dealing with the structural breaks in the common trends of national time series as the crisis caused a financial fragmentation of EMU along national lines of sovereign creditworthiness.

Table 7.3 - Pairwise correlations of main euro area variables, 1996-2016

	r	yt	s	ss	l.d	l.dd	l.df	l.de	l.do	l.ds	pj	pf
r	1.00											
yt	0.59	1.00										
s	0.84	0.84	1.00									
ss	0.90	0.80	0.93	1.00								
l.d	-0.68	-0.91	-0.80	-0.86	1.00							
l.dd	0.38	0.02	0.25	0.18	0.16	1.00						
l.df	-0.81	-0.74	-0.83	-0.80	0.68	-0.61	1.00					
l.de	-0.68	-0.84	-0.73	-0.89	0.90	0.02	0.66	1.00				
l.do	-0.78	-0.75	-0.74	-0.87	0.89	0.09	0.62	0.85	1.00			
l.ds	-0.09	-0.77	-0.47	-0.42	0.69	0.33	0.32	0.62	0.39	1.00		
pj	-0.74	-0.60	-0.65	-0.79	0.79	0.17	0.48	0.73	0.96	0.21	1.00	
pf	-0.80	-0.74	-0.77	-0.91	0.93	0.09	0.65	0.88	0.95	0.42	0.91	1.00

r = long-term govt. bond yield (%); yt = nominal GDP growth trend (5-yr moving avg., %); s = short-term interest rate (%); ss = short-term shadow interest rate (%); l.d = government debt/GDP (1-yr lag); l.dd = govt. debt held by residents excluding own national central bank/GDP (1-yr lag); l.df = govt. debt held by foreigners excluding estimated holdings of the Eurosystem other than the own national central bank /GDP (1-yr lag); l.de = govt. debt held by Eurosystem/GDP (1-yr lag); l.do = govt. debt held by EU+IMF/GDP (1-yr lag); l.ds = short-term govt. debt/GDP; pj = govt. funding privileges de jure (index); pf = govt. funding privileges de facto (index).

Since the structure of government debt is among the explanatory variables for the long-term sovereign bond yield, it is furthermore important to realise that the debt composition is itself the outcome of the

interaction of supply and demand factors including public debt management choices, investor preferences and public sector policies. This market process makes it necessary, first, to reduce the reverse causality bias in estimated coefficients associated with the long-term interest rate also affecting the debt structure; and, second, to limit the multicollinearity between the short-term interest rate and these same debt structure variables. A separation of the market interest rates and the various debt/GDP variables in time by lagging the latter by one year, as applied in Table 7.3, does not fully solve these econometric issues when these two sets of variables show common trends, as is evidently the case for the euro area.

Against this background, this section adopts a modest approach and restricts itself to a bivariate econometric analysis of the euro area average long-term government bond yield estimated for the period 1996-2016, connecting it one after the other with the explanatory variables discussed above using ordinary least squares (OLS) regression. The estimated bivariate models (see Tables 7.4 and 7.5) accordingly test one by one the additional explanatory power of nominal GDP growth (equation 2), monetary policy indicators (equations 3 to 5), the maturity and ownership structure of government debt (equations 6 to 8) and the preferential treatment of sovereigns in EU financial law (equations 9 and 10). The parameters estimated for each of the independent variables will as a consequence be subject to an omitted variables bias. All the euro area data cover the first 12 member countries of EMU. Since the stock of government debt is measured at year-end, whereas this study uses annual averages for market interest rates, the debt variables are always lagged by one year. Given the relatively small number of 21 annual observations, any conclusions must be drawn with great caution.

The equations shown below include the one-year lagged dependent variable among the explanatory variables and further include only one independent variable at a time, as well as a constant. Apart from the usual regression statistics, the tables also report the longer-run values of the estimated coefficients of the individual explanatory variables, the results of the Breusch-Pagan / Cook-Weinberg test for homoscedasticity (i.e. whether the null hypothesis H0 can be accepted that the variances of the standard error terms are all equal instead of increasing/decreasing with the fitted values of the independent variable) and the outcome of Durbin's h test for the presence of serial correlation (under the null hypothesis H0 that there is no serial correlation, using the option for small samples).[92]

The alternative whereby the long-term interest rate for the euro area is estimated in first differences was unsuccessful. Most of the separately included independent variables in first differences turned out to be insignificant, presumably because it constrains the parameter of the one-year lagged dependent variable to be one rather than allowing it to be freely estimated. Moreover, according Durbin's h test, these estimations showed strong serial correlation and the option of regressing in first differences was therefore discarded in favour of estimations of the long-term interest-rate in levels with a one-year

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[92] Note that the standard Durbin-Watson test for autocorrelation is not valid when the regression includes the lagged dependent variable.

lagged dependent variable to limit the otherwise strong serial correlation.[93] The Breusch-Pagan / Cook-Weinberg test as well as Durbin's h test suggest that also in this case there is ground for remedial measures to deal with heteroscedasticity and serial correlation in a few equations (numbers 1, 2, 3, 6 and 7), for example, by estimating robust (unbiased) standard errors. For these equations, both tables therefore report instead the robust standard errors in square brackets (which further leaves the coefficients and overall explanatory power of the regressions unchanged).

Equation (1) in Table 7.4 demonstrates that a large part of the euro area average long-term interest rate can be explained just by its own previous year value, as well as a constant, giving an adjusted R^2 of 0.84. The highly significant value of 0.85 for the estimated coefficient demonstrates the secular character of the decline in the long-term government bond yield observed for the euro area as a whole over the past two decades.

Equation (2) adds the trend in nominal GDP growth recorded for the eurozone, as captured by a five-year moving average. This explanatory variable is significant at the 5% level and its addition reduces the parameter for the one-year lagged long-term interest rate to 0.76. The long-run value for the coefficient of nominal GDP growth can be calculated at 1.09 (i.e. 0.263 divided by 1–0.759). This result indicates that the persistent decline in economic growth and inflation taken together has translated more than in full into a lower long-term interest rate. Some observers would interpret this finding as evidence of secular stagnation in the euro area which the ECB has tried to counter in recent years by pushing down the long-interest rate beyond the decline in nominal GDP growth.

Considering the influence of the ECB's monetary policy, the short-term interest rate appears as expected as a very important determinant of the long-term interest rate in the euro area (see equation 3). The coefficient of 0.30 is highly significant and leads to a long-run value of 0.75, which is at the top of the range of results found in other studies (Ciocyte et al., 2016, mention a range of 0.35 to 0.75). This high value is not surprising, given the absence of other explanatory variables in the estimation. Taken on its own, it indicates that in the end three-quarters of a given increase in the three-month money market rate transmits into a higher 10-year government bond yield and leads to a flatter or downward sloping yield curve.

Equation (4) replaces the short-term interest rate by the short-term shadow rate calculated by Krippner (2016) to better account for both the standard and the non-standard monetary policy operations, as well as for the ECB's forward guidance on the monetary stance. The coefficient on the short-term shadow rate receives a somewhat lower significant value of 0.23. Although the parameter for the one-year lagged long-term interest rate is also smaller than in the case of the short-term rate (0.50 compared to 0.60), the long-run impact on the government bond yield in this estimation is reduced to 0.47, well within the range for short-term interest rate effects reported by Ciocyte et al. (2016). The

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[93] Poghosyan (2014) and Ciocyte et al. (2016) employ cointegration techniques to separate the short-run dynamics from the long-run equilibrium, an econometric approach which they prefer over simple static regressions.

root mean square error (RMSE) of this equation is the lowest of all the 10 that are presented in this section. Moreover, the equation passes the Breusch-Pagan / Cook-Weinberg test for homoscedasticity and it is the only one of the five results reported in Table 7.4 where Durbin's h test clearly accepts the null hypothesis of no serial correlation in the residuals.

The importance of the Eurosystem's portfolio of euro area government debt for the long-term bond yield is tested in equation (5). The estimated coefficient is significantly negative (-0.18) and corresponds to a long-run value of -0.63. Hence, every percentage point increase in the Eurosystem's claims on euro area governments relative to GDP shaved off almost 20 basis points from the long-term interest rate after one year (or prevented a rise due to other economic factors) and three times as much in the long run, as long as the acquired debt was reinvested. The equation also satisfies the homoscedasticity test.

Table 7.4 – Explaining the euro area average long-term government bond yield, 1996-2016, I

(all equations estimated in levels; coefficients with standard errors reported in parentheses, robust standard errors in square brackets; statistical significance at the 10%, 5% and 1% level, respectively, for * p<0.10, ** p<0.05, *** p<0.01)

Explanatory variables:	Equation:	(1)	(2)	(3)	(4)	(5)
Long-term govt. bond yield		0.849***	0.759***	0.604***	0.504***	0.722***
(10-year maturity, lagged 1 year, %)		[0.075]	[0.061]	[0.070]	(0.091)	(0.088)
Nominal GDP growth trend			0.263**			
(five-year moving average, %)			[0.103]			
Short-term interest rate				0.299***		
(three-month maturity, %)				[0.071]		
Short-term shadow interest rate					0.233***	
(from mid-2007 Krippner 2016, %)					(0.048)	
Govt. debt held by Eurosystem						-0.176**
(lagged 1 year, % of GDP)						(0.067)
Constant		0.302	-0.117	0.654*	1.456***	1.502**
		[0.390]	[0.428]	[0.305]	(0.355)	(0.568)
Long-term coefficient of independent variable		-	1.091	0.755	0.470	-0.633
Number of observations		21	21	21	21	21
R^2 adjusted		0.836	0.863	0.893	0.925	0.875
RMSE		0.593	0.541	0.479	0.400	0.517
BP/CW test: H0 = error variances are equal [1]		reject	reject	reject	accept	accept
Durbin's h-test: H0 = no serial correlation		reject	reject	reject	accept	just reject

Note 1): BP/CW test is the Breusch-Pagan / Cook-Weinberg test for homoscedasticity.

The next set of estimations examined the interest-rate impact of the stock and composition of euro area government debt as well of the euro area budget deficit. No significant influence could be found for the total outstanding amount of debt relative to GDP (not even after removing the part of debt held by the Eurosystem and the EU/IMF). A split between government debt held by residents and by non-residents of the member countries, given their potentially different attitudes toward sovereign creditworthiness, did not change this result: both variables were insignificant. The same result applied to the short-term component of government debt (up to one year maturity) and the amount of shortly maturing debt (to be refinanced within one year). Equally, a separate influence of the government's (primary or total) budget balance on the long-term interest rate for the euro area could not be established in this study.

An alternative was found by explicitly allowing for the break caused by the euro area crisis. Equation (6) in Table 7.5 includes a pre-crisis time series for the foreign-held government debt-to-GDP ratio whereby the data for 2008-2016 are set at zero. The annual figures are also adjusted for the estimated holdings of debt by the Eurosystem other than the own national central bank. With this adjustment, the amount of euro area government debt in the hands of non-nationals of member countries doubles from 16% of GDP in 1996 to 32% in 2007. This pre-crisis variable (lagged by one year) results in a positive coefficient of 0.02, which is significant at the 5% level, i.e. before the euro area crisis erupted, the long-term interest rate increased by 2 basis points for every percentage point of GDP addition to the adjusted stock of euro area government debt owned by foreigners.

This estimated impact on the long-term bond yield is close to the 2.3 basis points found by Fall and Fournier (2015) for the total of government debt of EMU countries. According to Ciocyte et al. (2016), the literature has found a consensus that the interest-rate sensitivity of total government debt lies between 2 and 5 basis points. Taking account of the long-run adjustment process, the pre-crisis interest-rate impact of government debt owned by foreigners relative to GDP rises to 10 basis points, showing a considerable effect from non-nationals on fiscal discipline. Although it could not be identified as such, the disciplinary effect from international investors should in principle have become even more pronounced during the euro area crisis given the sudden stop and reversal of foreign capital flows to the affected countries.

Equation (7) examines the interest-rate impact of the domestic component of euro area government debt to GDP, i.e. the part held by residents of the euro area countries (excluding their respective national central banks), restricting this variable however to the crisis years while setting the pre-crisis data (1996-2007) at zero. Adjusted national-held debt rose from 33% of GDP in 2007 to a high of 45% in 2013, after which it declined again to 38% of GDP in 2016. The negative coefficient for this variable of -0.02 is significant at the 5% level and reaches -0.06 in the long run, suggesting that the growing 'home bias' in government debt during the euro area crisis had a stabilising effect on national sovereign bond markets; although less visible at the euro area level, it was clearly evident in the crisis-hit euro area countries (see Section 4.2.3). As discussed in Section 4.4.1, some authorities used non-

standard public debt management tools or even financial repression to persuade residents to hold on to more risk-prone government debt and/or to accept a more affordable interest rate remuneration below the prevailing distressed bond market yields for new debt issuance. This fiscal insurance was reactivated during the euro area crisis, after it had not been needed for a long time because in many euro area countries foreigners partly replaced captive residents and became an important part of the government debt investor base after capital markets were opened up in the 1990s.

Table 7.5 – Explaining the euro area average long-term government bond yield, 1996-2016, II

(all equations estimated in levels; coefficients with standard errors reported in parentheses, robust standard errors in square brackets; statistical significance at the 10%, 5% and 1% level, respectively, for * p<0.10, ** p<0.05, *** p<0.01)

Explanatory variables:	Equation:	(6)	(7)	(8)	(9)	(10)
Long-term govt. bond yield		0.795***	0.729***	0.649***	0.682***	0.640***
(lagged 1 year, %)		[0.051]	[0.064]	(0.075)	(0.078)	(0.088)
Adjusted govt. debt held by foreigners [1]		0.020**				
(lagged 1 year, % of GDP, 1996-2007)		[0.009]				
Adjusted govt. debt held by residents [2]			-0.016**			
(lagged 1 year, % of GDP, 2008-2016)			[0.007]			
Govt. debt held by EU/IMF [3]				-0.332***		
(lagged 1 year, % of GDP, 2010-2016)				(0.075)		
Govt. funding privileges in EU law					-9.748***	
(de jure index, range 0-1)					(2.598)	
Govt. funding privileges in EU law						-5.602***
(de facto index, range 0-1)						(1.575)
Constant		0.226	1.075**	1.460***	4.09**	3.141***
		[0.328]	[0.376]	(0.381)	(1.05)	(0.856)
Long-term coefficient of independent variable		0.098	-0.059	-0.946	-30.654	-15.561
Number of observations		21	21	21	21	21
R^2 adjusted		0.861	0.861	0.917	0.903	0.898
RMSE		0.545	0.545	0.421	0.456	0.467
BP/CW test: H0 = error variances are equal [4]		reject	reject	accept	accept	accept
Durbin's h-test: H0 = no serial correlation		reject	reject	accept	accept	accept

Note 1): Adjustment means that government debt held by foreigners excludes estimated holdings of the Eurosystem other than the own national central bank; time series set at zero for crisis years.

Note 2): Adjustment means that government debt held by residents excludes holdings of the national central bank; time series set at zero for pre-crisis years.

Note 3): EU/IMF loans to euro area governments are zero before 2010.

Note 4): BP/CW test is the Breusch-Pagan / Cook-Weinberg test for homoscedasticity.

The EU/IMF's financial assistance was quantitatively of importance during the sovereign debt crisis, with the emergency loans rising from nil in 2009 to a peak of over 4% of euro area GDP in 2013, after which it slightly declined due to repayments. According to equation (8), this official sector support had a very significant mitigating impact on capital market conditions as it reduced the euro area long-term interest rate by 33 basis points (or avoided a rise caused by other economic factors) for every percentage point of GDP of loans granted during this crisis episode. Taking a long run perspective, this dampening effect on interest rates is even 95 basis points. While these estimates appear very high and may not be very precise, they show the importance of distinguishing official from private owners of government debt when explaining the euro area average long-term interest rate dynamics. The estimated equation also passes both the Breusch-Pagan / Cook-Weinberg homoscedasticity test and Durbin's h test for the absence of serial correlation.

The relevance of EU prudential financial law for long-term bond yields is demonstrated by including a variable for the preferential regulatory treatment of claims on the government, which is an innovation compared to other studies. The two alternative variants of the index constructed in Section 5.4.3, respectively comprising scores for de jure and de facto government funding privileges at the EU level (see Figure 5.1), were extended backwards in time for the purpose of this empirical analysis. As is clear from equations (9) and (10), both the announced and actual introduction of new government funding privileges (which gathered pace in particular after 2008) had on their own a significant dampening effect on the euro area long-term bond yield as it led the affected financial investors to adjust their portfolios in favour of government debt securities. The strongest interest-rate effect is exercised by the de jure index based on all government funding privileges in force; it is almost twice as large as that estimated for the de facto index which also takes account of anticipation effects for EU legislation that is still being discussed. Both equations also meet the Breusch-Pagan / Cook-Weinberg test for homoscedasticity as well as Durbin's h test for the absence of serial correlation.

As the next step, the empirical analysis turns to the actual government interest payments relative to the stock of debt in the previous year. This <u>implicit interest rate effectively paid by governments</u> (i_t) is mainly associated with the current short-term rate and the trajectory of current and past long-term interest rates (denoted by s_t and the history of r_t, respectively), whereby the corresponding relative weights ($\omega 1_t$ and $\omega 2_t$) are determined by the maturity composition of government debt. Analogous to Caprioli and Momigliano (2011) and Anaya and Pienkowski (2015), formula (7.1) establishes the pass-through of weighted market interest rates to the implicit interest rate taking account of the average residual maturity (n_t) of all longer-term debt outstanding:

$$i_t = \omega 1_t \, s_t + \sum_{j=0}^{n_t-1} \omega 2_{t-j} \; r_{t-j} \qquad (7.1)$$

whereby the weight $\omega 1_t$ for the short-term rate and the weights $\omega 2_{t-j}$ for the history of long-term yields during n_t add up to 1.

The path of long-term government bond yields influences the implicit interest rate during the whole average fixed term to maturity. While the direct impact of the short-term rate on the implicit interest rate is one-off (also via debt issued at a variable coupon), its current value and expected future path also enter indirectly through the history of long-term interest rates (see Section 6.6.3).

The corresponding linearised formula for the euro area implicit interest rate (i^{ea}_t) can be written as:

$$i^{ea}_t = \eta_1 s^{ea}_t + \eta_2 rh^{ea}_t + \eta_3 n^{ea}_t + c^i_t + \varepsilon^i_t \quad (7.2)$$

with η_i giving the coefficients of the variables of influence, namely the euro area short-term interest rate (s^{ea}_t), which captures the cost of short-term debt; the history of the long-term government bond yield (rh^{ea}_t, represented by a five-year moving average) to account for the gradual transmission of sovereign bond market conditions to the cost of funding for euro area governments; and the average residual maturity of all euro area government debt outstanding as a reflection of the changing maturity composition (n^{ea}_t); and c^i_t standing for the constant and ε^i_t for the residual of the equation.

The empirical estimate of this definition of the implicit interest on euro area government debt over the period 1996-2016 is:

$$i^{ea}_t = 0.305\, s^{ea}_t + 0.519\, r^{ea\,(5\,yr.avg.)}_t - 0.364\, n^{ea}_{t-1} + 3.706 \quad (7.3)$$

SE: (0.031)***   (0.061)***   (0.147) **   (1.146)***

Number of observations: 21; R^2 adjusted: 0.987; RMSE: 0.159.

BP/CW test of H0 = error variances are equal: accept; Durbin's h-test of H0 = no serial correlation: accept.

The two market interest rates in equation (7.3) appear with the expected positive coefficients and are highly significant. The secular decline in short and long-term interest rates since the mid-1990s has correspondingly transmitted into a lower implicit interest rate on government borrowing. The two coefficients could be interpreted as the relative weights of marketable short-term and long-term government debt securities in private sector portfolios; they add up to 0.82. The residual of 0.18 may be accounted for by treasuries placing non-marketable government loans directly with private counterparties. Moreover, the official sector holds an increasing amount of claims on euro area governments and has effectively taken this debt off the market (assuming that it is not sold again but kept to maturity). The high and significant value of the constant also indicates that non-market forces and/or non-price elements not yet captured in the equation play an additional role.

The prudent strategy of euro area public debt managers towards maturity lengthening has paid out in a lower effective borrowing rate. The average residual maturity of debt has the expected negative coefficient, with every year that the maturity is longer saving euro area governments 36 basis points. This empirical result is somewhat above the finding of Beetsma et al. (2017) for a panel of OECD countries that the pursuit of a longer average residual maturity on the total stock of central government debt over the period 1980-2007 has translated on average in 20-30 basis points lower long-term sovereign bond yields. The fact that the benefits of a longer maturity appear a bit larger in the current

study may be related to the focus on general government debt of EMU countries and a much shorter estimation period that, however, includes the most recent episode of yield curve flattening and ultra-low interest rates which stimulated the issuance of debt securities with ultra-long maturities.

7.5   Conclusions and further avenues of research

The preliminary empirical analysis in this chapter cautiously suggests that the secular decline in euro area average government borrowing costs can be related to developments in variables representative of public debt management, financial regulation and monetary policy as these, each examined in turn, affected the supply and demand dynamics for euro area government debt over the period 1996-2016. The ECB's standard and non-standard monetary policy came out as a significant determinant of the long-term interest rate. A particular innovation was to highlight the individual contribution of different categories of debt owners, notably domestic creditors, foreign investors and the official sector (EU/IMF). Before the euro area crisis, non-national market participants represented a disciplinary force on public finances through their impact on the euro area average bond yield. The growing 'home bias' in public debt since 2008 appeared as a direct channel through which governments could have employed the tools of financial repression to exploit resident investors as a fiscal insurance in distressed capital market conditions. Official loans from the EU/IMF also helped to contain bond market rates during the euro area crisis. This study further investigated as one of the first in its kind the independent influence of government funding privileges in EU prudential law on the government bond yield of the euro area and found a significant influence of this 'quasi-tax on finance'.

The analysis further demonstrated how the secular decline in both short and long-term market interest rates in conjunction with a rising average residual debt maturity has transmitted into a lower implicit interest rate paid on euro area aggregate public debt from a high of almost 8.5% in 1995 to a low of 2.5% in 2016. This has cut the annual interest bill for euro area governments from nearly 5.5% of GDP to just 2.3% over the same period, with a further decline still in the pipeline. These savings occurred despite the fact that euro area government debt was broadly stable at around 70% of GDP from 1995 to 2007, subsequently saw a sharp rise during the euro area crisis to a peak of 94% in 2014, and only then entered on a modestly declining path.

Apart from undertaking additional robustness tests, this study could be extended in various directions. One possible avenue is to further break down the ownership of euro area government debt with the aim to separately examine how the portfolio decisions of domestic banks, pension funds, insurance companies, and other categories of resident holders affect long-term interest rates. These results could be compared with those of different categories of foreign creditors. For example, in the first quarter of 2016, foreign central banks held 15% of euro area central government debt as reserve assets (with a relatively high share for the German bund). These foreign official bodies are presumably a more stable source of government funding than other, more fickle types of foreign investors.

Another interesting avenue is to exploit the cross-country dynamics of government borrowing costs within the eurozone by setting up a panel data analysis. The main focus could be to study the

dynamics of national long-term interest rates as well as their spreads relative to Germany, taking account of the composition of government debt at the country level where the data allow. Taking this route has the advantage of enlarging the number of observations on which to base any conclusions. As already mentioned, account would have to be taken of common trends among the euro area countries, which reduces again the available free observations. The degrees of freedom are even more reduced when the regime shift constituted by the euro area crisis is considered. For example, Ludwig (2014) finds for most euro area countries one or more significant structural breaks in the behaviour of their government bond yields relative to Germany at the time of the financial crisis of 2007-2008 and/or the sovereign debt crisis of 2010. Given the rather limited scope for conducting an econometrically sound panel data analysis in the specific circumstances of EMU, this route was left unexplored.

A further avenue could be to analyse the multiple determinants of government bond yields in Europe seen over a very long horizon, covering the secular rise as well as the secular decline in interest rates from the Second World War until the present. Such a multivariate study could uncover to what extent current ultra-low interest rates are exceptional and here to stay, or not. However, it would no longer relate to the EMU context and the use of financial repression techniques as a fiscal insurance in a severe crisis.

All these different avenues face particular data availability constraints, making it necessary to concentrate on selected euro area countries instead of the whole group of first 12 EMU members, central government rather than general government, debt securities rather than total debt, and more broad-brush explanatory variables. Following one or more of these avenues is left for future research when more data and suitable sources could be available.

7.6   References

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8.   Summary and conclusions on modern financial repression in Europe

The sharp rise in public debt-to-GDP ratios in the aftermath of the global financial crisis of 2008 posed serious challenges for fiscal policy in euro area countries, in particular as many of them appeared vulnerable to a 'debt run' on the part of foreign investors. The main objective of this thesis was to examine whether and to what extent modern financial repression to secure and, if necessary, enforce public debt sustainability has been evident in Europe over the past 10 years.

Chapter 2 started off with a general description of the concept of financial repression, concluding that it stands for a (sometimes hidden) form of state intervention in the market process of financial intermediation between savers and investors using purely discretionary instruments, distinct from transparent financial market regulation and rule-based monetary and fiscal policies. The result is a diversion of the flow of funds in the economy, which may culminate in attempts to expropriate assets in case rising public or private debt becomes unsustainable. Two main theories explain what motivates a country to enter into a repressive financial regime, both focused on serving the public interest, whereas two opposite views consider financial repression to be a tool for promoting private interests.

The first theory, indicated as the public policy view, sees the state as a benevolent social planner who uses measures of financial restraint with the objective to promote an efficient capital allocation, a stable economy and a socially acceptable distribution of income and wealth in the interest of society, while taking for granted that these positive outcomes may be accompanied by economic inefficiencies and other negative side-effects. The second theory, described as the public finance view, considers that the government will intrude on financial markets so as to ease its own budget constraint and, if necessary, to resolve a public debt overhang. Financial repression in these two theories is justified with reference to the vital role of public debt as anchor for the financial and monetary system and the importance of a strong fiscal capacity for stabilising the business cycle and funding the welfare state.

By contrast, the Austrian School of economics sees the state as a malevolent operator whose pervasive interference with free market processes distorts market prices and creates opportunities for private rent creation. The low-interest-rate bias associated with financial repression changes incentives to save and invest and shifts the intertemporal allocation of resources towards debt-driven overconsumption and malinvestment. The macroeconomic benefits will unravel in the longer run when the unsustainable structure of production is corrected and realigned with market prices. Finally, the political economy view argues that rent-seeking actors will strive to exploit the coercive powers of the state in order to extract economic rents from financial market participants. Politicians may use the proceeds to hand out financial repression subsidies to favoured groups in society or to themselves. Hence, financial repression serves private interests and those of the ruling government rather than the common good.

With a view to the fiscal policy challenges facing the euro area countries, financial repression for the purpose of this thesis is defined as the government's strategy – supported by monetary and financial policies – to gain privileged access to capital markets at preferential credit conditions and divert resources to the state with the aim to secure and, if necessary, enforce public debt sustainability.

Chapter 3 reviewed the financial repression techniques and channels for securing the sustainability of public debt. The standard reform-oriented strategies available to governments to stabilise the public debt-to-GDP ratio and place it on a declining path are compared with the non-standard instruments of financial repression which might be employed in addition as a fiscal insurance to relieve liquidity stress and a debt overhang. Historically, many of the state interventions in the field of money and finance had a fiscal or quasi-fiscal character, which suggests that the predominant reason of financial repression was to tap an easy source of revenues for the public sector, which could help to stabilise public finances and might also be used to subsidise favoured private actors. The policy domains of the treasury, financial regulator as well as the central bank were intertwined and played a crucial role in keeping residents invested in government debt securities even when its nominal value was inflated away and the interest rate was capped. A captive domestic investor base fulfilled the government's financing needs and also facilitated a potential debt restructuring. Consequently, financial repression amounted to fiscal dominance over financial and monetary policies allowing the government to evade market discipline, finance a larger budget deficit and maintain a higher public debt than otherwise.

The question addressed in this thesis was whether and how in modern times with open capital markets financial repression could reappear to secure the sustainability of public debt in Europe. As it turns out, the Treaty on the Functioning of the European Union contains several openings which allow the EU and national authorities to address overriding financial and monetary stability concerns and at the same time ease government budget constraints. This fiscal protectionism stands in contrast with the basic philosophy of the EU Treaty, namely that Member States are responsible for their own public finances and deficit financing is to be disciplined by the capital market. The privileged role assigned to public debt in financial and monetary policies may interact with non-standard public debt management operations to exercise an important stabilising influence over sovereign bond markets, which could undermine incentives for fiscal reforms and in economic terms is equivalent to the use of financial repression techniques known from the past. The following chapters studied in detail to what extent these modern forms of financial repression were evident in the eurozone over the past 10 years.

Chapter 4 noted that at the start of the global financial crisis of 2008 many euro area countries were in a vulnerable fiscal position, especially those that since opening up their capital markets and joining EMU had allowed macroeconomic, fiscal and financial imbalances to accumulate. The financial turbulence and the subsequent deep recession exposed their fiscal vulnerability and threw them into a sovereign debt crisis, which was aggravated by a vicious feedback loop between governments too weak to rescue troubled banks yet again and the same banks having a large credit exposure to their own government. As default risks increased and credit ratings were cut, foreign investors transferred their money to safe havens. Government bond yields ratcheted up and several countries were unable to meet their gross financing needs at affordable costs and lost access to the capital market.

This study finds that the euro area countries, in particular those hit hard by the crisis, applied both standard and non-standard public debt management techniques aimed at restoring the sustainability of

public debt. Apart from taking austerity measures, they actively persuaded domestic investors (retail savers, banks, pension funds and insurance companies) to maintain and increase their sovereign credit exposure while some governments used forceful measures to overcome their budget constraint. This financial repression to increase the domestic demand for government debt also exploited the ECB's exceptional liquidity operations and was further assisted by supervisory pressure on banks to keep capital in the country and to repatriate capital held abroad. Greece and Cyprus temporarily restricted capital outflows in turbulent market conditions when savers and investors feared for expropriation of their assets. The attempts to create a captive domestic investor base facilitated both government funding and debt restructuring, but also entrenched the fragmentation of euro area capital markets along national lines and tightened the financial nexus between banks and their sovereign.

Chapter 5 examined the evidence of a preferential treatment of public debt in the governance of finance in Europe. The European authorities have been active in correcting market and regulatory failures that became apparent in the wake of the global financial crisis. They set out to limit the scope for excessive risk-taking, tighten prudential supervision and raise the size of required cushions in the financial sector. Conditional EU/EMU official assistance and ECB market support facilities for struggling euro area sovereigns were set up and major steps towards a European Banking Union were taken. The extensive overhaul of European financial governance was accompanied by special privileges for government funding and debt resolution, which were maintained or newly introduced on prudential grounds and to preserve financial and monetary stability in the euro area as a whole.

The associated government favours are apparent in the captive sovereign credit markets created by prudential legislation for financial institutions which disregards the risks from large sovereign exposures; the reduced market pressure associated with new restrictions placed on short-selling of government bonds, buying sovereign default protection and issuing sovereign credit ratings; the proposed common financial transactions tax if it would exempt trading in government bonds; the availability of official rescue funds and market support facilities that might be exploited to excessively suppress sovereign bond yields in times of fiscal stress; the exceptional possibility for euro area countries to initiate a 'voluntary' debt restructuring while subordinating private creditors; and the apparent ease with which even insured savers might be expropriated when resolving a troubled systemic bank while introducing capital controls to prevent them from shifting their assets abroad.

This chapter also presented a new composite index of government funding privileges in 10 selected cases of EU prudential legislation introduced over the period 2008 to 2017. The rise in the value of the index shows a growing de jure and de facto preferential regulatory treatment of public sector securities relative to those of the private sector over time, with the total score for these government favours so far reaching a peak in 2019-2020 as new privileges are offset by some elements of EU prudential legislation becoming slightly less generous. Giving their comprehensive character, any reversal of the preferential treatment of public debt in EU financial law will be complex and require a careful approach.

While well-intentioned, European financial reforms since 2008 also contributed to easing government funding constraints, reducing sovereign bond yields and making the public debt overhang appear as sustainable. This finding may be interpreted as the reappearance of financial repression in a modern supranational guise. Protecting governments against market-induced fiscal discipline raises moral hazard concerns as it promotes a bias towards debt-financed public spending and postponing economic adjustment, especially in euro area countries. Countering these concerns could overburden the reinforced EU surveillance framework and the conditionality of official sector assistance. While the bill of the financial and economic crisis landed with the public sector, giving euro area governments a preferential access to finance and easier debt resolution could open the gate for a transfer of private income and wealth to the public sector, both in tranquil and in turbulent times.

Chapter 6 reviewed the debate on the drivers behind the secular decline in global interest rates since the early 1980s to historical lows in 2016. According to the secular stagnation view, this phenomenon reflects a declining natural or neutral rate of interest due to desired savings persistently exceeding investment plans. The consequent chronic shortfall in aggregate demand is explained by the fact that monetary policies were mostly too tight and would have required assistance from expansionary fiscal policies in order to return the economy to full employment, even more so when central bank rates reached the zero lower bound.

On the opposite side, the financial repression view argues that monetary policymakers pegged interest rates persistently below their natural level with the objective to divert resources to the state. The economic consequences can be analysed with the Austrian business cycle theory. The Austrian School believes that too low interest rates distort the time preference of consumers, fuel credit growth for uneconomical private investment projects, promote public spending and cause an unsustainable capital structure. The result is a booming economy followed by an unavoidable bust which will lead central banks to cut interest rates, thereby preventing a correction of the original misallocation of resources and setting the scene for a repetition of this boom/bust cycle. The economy will, as a result, develop along a downward path for potential output growth. Financial repression linked to the Austrian business cycle theory therefore offers an alternative explanation for interest rates trending down.

After experimenting with monetary targeting, many central banks returned to pegging the short-term interest rate in order to achieve their monetary policy objectives. Changing the short-term rate relative to a neutral benchmark rate would affect expectations and hence longer-term interest rates, credit conditions and private spending decisions, and ensure macroeconomic stability. Following the global financial crisis, monetary policy rates reached the zero lower bound, which constrained the ability to respond to very low inflation with conventional interest rate cuts in a situation marked by a negative neutral real interest rate and in most cases a missing fiscal expansion. Central banks then applied forward guidance as well as credit and quantitative easing to directly push down the sovereign yield curve. These unconventional measures responded to secular stagnation and were in economic terms equivalent to financial repression for the benefit of governments.

Concentrating on the case of EMU, the ECB has consistently focused on fulfilling its euro area mandate of price stability. However, the pre-crisis success in maintaining low and stable consumer price inflation at the euro area level was unsustainable in a situation of some member economies experiencing Austrian-style credit-driven imbalances fuelled by capital inflows in search for higher yields. With the benefit of hindsight, the monetary pillar of the ECB's strategy and the nature of credit growth should have received more prominence in those days. During the euro area crisis, the ECB set out to provide ample liquidity, repair monetary transmission channels and lower the cost of credit. The exceptional monetary measures can be understood as a prolonged effort to first stabilise the financial system, then to reduce financial fragmentation and, finally, to counter secular stagnation and low inflation in the eurozone.

Although the euro area governments also took stabilisation measures, they came to rely on the ECB to do whatever it takes to stabilise the euro. The ECB's crisis interventions in selected securities markets and the more recent substantial monetary accommodation have pushed interest rates down to very low or negative levels and may have contributed inadvertently to delaying the necessary reallocation of resources to more productive destinations. While geared at restoring price stability in the euro area as a whole, these uncommon monetary policy interventions also generated significant budgetary advantages for all euro area countries, as they suppressed inherent sovereign yield spreads, offered indirect monetary financing, and contributed to moral hazard on the part of high-debt sovereigns. The exit from this exceptional monetary stimulus may therefore lead to substantial new fiscal challenges.

Chapter 7 presented a first step in the empirical analysis of the determinants of the secular decline in euro area average government borrowing costs during 1996-2016, which occurred despite the fact that the government debt-to-GDP ratio initially stayed at a rather high level, sharply increased during the euro area crisis, and since then only modestly declined. The results cautiously suggest that the explanatory variables representing public debt management, financial regulation and monetary policy, each on their own, affected the supply and demand dynamics for euro area government debt and had a dampening effect on long-term bond yields. Together with EU/IMF official assistance, these public policies also contributed to keeping or making government debt affordable during the euro area crisis.

Over the past 10 years, European financial and monetary policymakers have intervened heavily in open capital markets. Whether intended or not, they assisted the standard and non-standard public debt management strategies of euro area treasuries in maintaining or restoring fiscal sustainability. This was achieved, in particular, by strengthening regulatory incentives to hold public rather than private debt, suppressing inherent sovereign risk, and facilitating public debt resolution in exceptional circumstances. These modern forms of financial repression gained political acceptance and judicial approval under the umbrella of safeguarding financial and monetary stability for the euro area as a whole, even though they created moral hazard among euro area governments, contributed to excessive risk-taking and a misallocation of resources, interfered in the distribution of income and sometimes entailed an expropriation of private assets.