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Abstract

This thesis seeks to draw a comparative picture between the situation of the European and United States (US) banking systems back in 2008 and their current status ten years after the Great Financial Crisis (GFC). More precisely, the thesis first investigates the roots of both financial systems to establish a basis for further understanding of the impact of the GFC and subsequent measures on the two real economies. Supplementing, regulatory and supervisory improvements are discussed in the chapters that follow the economic analysis, especially in regards to Basel III. The main findings of this thesis suggest that both the US and Europe have made significant progress since the GFC but Europe still exhibits major deficiencies in its periphery while asset prices and interest rates rise in the US – supported by positive corporate earnings reports.

Zusammenfassung

Diese Arbeit verfolgt das Ziel, ein vergleichendes Bild zwischen dem europäischen und amerikanischen Bankensystem von 2008 und der Situation zehn Jahre nach der globalen Finanzkrise darzustellen. Genauer gesagt erörtert diese Arbeit zuerst die Ursprünge der beiden Finanzsysteme, um eine Ausgangsbasis für das Verständnis dafür zu schaffen, welche Auswirkungen die Finanzkrise und darauffolgende Maßnahmen auf die beiden Realwirtschaften haben. Ergänzend werden dann im Anschluss an die ökonomische Analyse die regulatorischen und die (Banken-)Aufsicht betreffenden Verbesserungen diskutiert, insbesondere in Betracht auf die Basel III Verordnung. Die Resultate dieser Arbeit suggerieren, dass sowohl Europa als auch Amerika einen signifikanten Fortschritt seit der Finanzkrise zu verzeichnen haben, allerdings weist Europa immer noch deutliche Defizite in Bezug auf die Peripheriestaaten auf, während in den Vereinigten Staaten sowohl die Vermögenswerte als auch die Zinsen steigen – unterstützt von positiven Unternehmensgewinnen.

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Abbreviations

ABS	Asset-Backed Securities
ABSPP	Asset-Backed Securities Purchase Program
AIG	American International Group
ARRA.....	American Recovery and Reinvestment Act
BRRD.....	Bank Recovery and Resolution Directive
BCBS.....	Basel Committee on Banking Supervision
CBPP	Covered Bond Purchase Program
CDO	Collateralized Debt Obligation
CDS	Credit-Default Swap
CET1.....	Common Equity Tier1
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
DGS.....	Deposit Guarantee Schemes
DRI	Direct Recapitalization Instrument
EAPP	Extended Asset Purchase Program
EBA	European Banking Authority
EC.....	European Commission
ECB	European Central Bank
EDIS	European Deposit Insurance Scheme
EERP	European Economic Recovery Plan
EESA	Emergency Economic Stabilization Act
EFSF.....	European Financial Stability Facility
EFSM.....	European Financial Stabilisation Mechanism
ESM.....	European Stability Mechanism
EU.....	European Union
FDIC	Federal Deposit Insurance Corporation
Fed	Federal Reserve System
FOMC	Federal Open Market Committee
FSI	Financial Soundness Indicator
GDP.....	Gross Domestic Product
GFC	Great Financial Crisis
GIPSIC.....	Greece, Ireland, Portugal, Spain, Italy, Cyprus
HICP	Harmonized Index of Consumer Prices
IMF	International Monetary Fund

IRB.....	Internal Ratings-Based
LCY.....	Local Currency
LLC.....	Limited Liability Company
M&A.....	Mergers and Acquisitions
MBS.....	Mortgage-Backed Securities
MFI.....	Monetary Financial Institution
MiFID II.....	Markets in Financial Instruments Directive II
NPL.....	Non-Performing Loans
OBS.....	Off-Balance-Sheet
OECD.....	Organisation for Economic Co-operation and Development
OLA.....	Orderly Liquidation Authority
OMT.....	Outright Monetary Transactions
OTC.....	Over-The-Counter
P(I)IGS.....	Portugal, (Ireland), Italy, Greece, Spain
QE.....	Quantitative Easing
REER.....	Real Effective Exchange Rate
ROE.....	Return on Equity
RWA.....	Risk-Weighted Assets
SDW.....	Statistical Data Warehouse
SEC.....	Securities and Exchange Commission
SIV.....	Structural Investment Vehicles
SMP.....	Securities Markets Program
SRB.....	Single Resolution Board
SREP.....	Supervisory Review and Evaluation Process
SRM.....	Single Resolution Mechanism
SSM.....	Single Supervisory Mechanism
TARGET2.....	Trans-European Automated Real-Time Gross Settlement Express Transfer System
TARP.....	Target Assets Relief Program
TBTF.....	Too Big To Fail
TFEU.....	Treaty on the Functioning of the European Union
TLTRO.....	Targeted Long-Term Refinancing Operations
UK.....	United Kingdom
US(A).....	United States (of America)

1. Introduction

It has now been a decade since the Great Financial Crisis's (GFC) economic woes affected almost each and every country in the world, not only causing financial systems to heavily tumble and partially break down in some cases but also resulting in a massive drawdown of national growth rates, sharply dropping asset prices, vanishing liquidity, increasing unemployment and several other negative outcomes.

That being said, it is of no doubt that globally integrated financial systems like the ones existing in the United States (US) or Europe play a major role in the trajectory of the recovery process following the GFC. This is especially true for Europe and its banking system, since it not only had to face spillovers from the sub-prime mortgage crisis (Bhalla, 2009; Zestos, 2015) but also had to resolve issues that emerged from the European sovereign debt crisis. Therefore, it is of even greater importance for European banks and supervisors to prudently take action concerning several factors that will be examined throughout this thesis, not least because Europe's banking system is relatively large on a global perspective (for example, when comparing it against the United States and Japan; Langfield & Pagano, 2016).

Predominantly, the objective of this thesis is to take a step back and recap what has happened over the last ten years when looking at important global banking systems. More specifically: the outline of this examination is mainly focused on the evolution of the European banking system since the GFC 2007/2008 while contemporaneously supplementing essential events and observations with changes that took place in the United States.

Concerning the structure, there will be various sections or types of topics that discuss the happenings of the last decade:

First, chapter 2 discusses the historical roots of the European and the US banking systems and how they evolved to what they incorporate today.

Second, chapter 3 examines the origin of the GFC along the build-up of the housing bubble and its subsequent impact on the economy.

Next, chapter 4 will discuss in detail the fiscal and regulatory responses to the GFC for the US and Europe and, in case of the latter, also to the sovereign

debt crisis. More precisely, chapter 4.1 covers immediate and time-critical responses by both economies. Chapter 4.2 investigates the role of monetary policy during and after the GFC. Successively, chapters 4.3, 4.4 and 4.5 mainly scrutinize the evolution of Europe's idea of a banking union, critically analyze the banking sector under the influence of the new Basel III Accord while also factoring in systemic risk and, lastly, review the importance of a sophisticated forward guidance framework within central bank communication.

Lastly, chapter 5 concludes this thesis and gives a concise outlook on future possibilities and persistent issues for the banking sector and the economy.

2. Historical origin of the European and US financial structure

In their analysis of Europe's bias towards being a more bank-based financial system and its impact on systemic risk and growth, Langfield and Pagano (2016) assembled together quite some interesting statistics about how differently major banking systems like Europe, the United States and the United Kingdom (UK) have grown since the end of the 19th century.

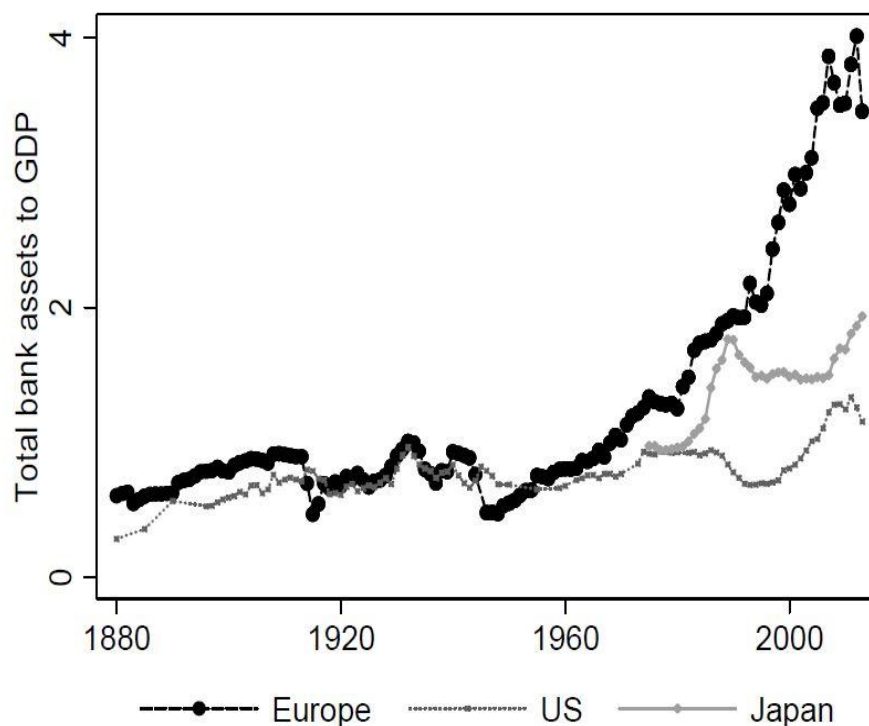


Figure 1: Total bank assets
(percent of GDP; source: Langfield & Pagano, 2016, p.32)

More precisely, Figure 1 shows the ratio of total bank assets to GDP for Europe, the United States and Japan.¹ It clearly displays a divergence in terms of the size of those banking systems, arguably starting around the end of the 1980's. Comparing them roughly 25 to 30 years later shows a ratio of total assets to GDP of over 300% for Europe and yields barely over 100% for the

¹ The authors note that the composition for Europe's total assets consist of seven countries, namely Belgium, Denmark, Germany, Italy, the Netherlands, Spain and the United Kingdom due to long-term availability reasons.

United States, characterizing the European system as heavily bank-based and the US as traditionally market-based. This is in line with the fundamental comparison that has previously been broken down by Allen and Gale (2000): For the US the build-up of market confidence and focus seems a bit more unexpected, since the authors state that the meaningfulness of its market-based roots is rather a consequence of regulation and reaffirmation of market integrity via the introduction of the Securities and Exchange Commission (SEC) and the fact that banks may have been under higher restrictions than capital markets. The UK plays a comparably unique role as it historically drew its funding liquidity from capital markets during times of war (of which they fought many during the century before the foundation of the London Stock Exchange) and developed a strong, concentrated banking system, as well.

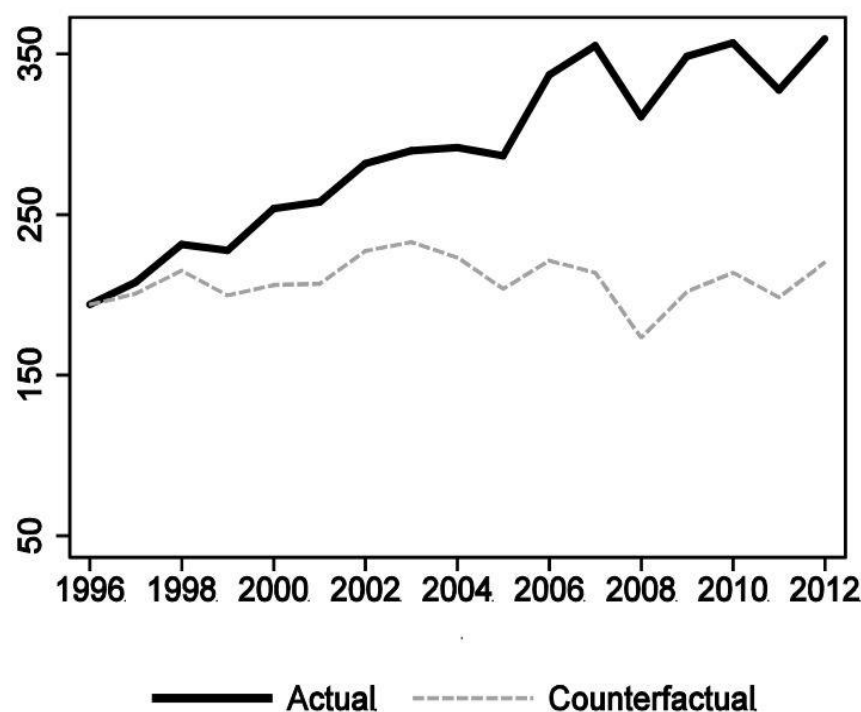


Figure 2: Total EU bank assets (counterfactual)
(percent of GDP; 1996 = 100; source: Langfield & Pagano, 2016, p.46)

On the other hand, Langfield and Pagano (2016) show how actual total bank assets in relation to GDP have grown in contrast to a hypothetical

(“counterfactual”) increase in line with nominal GDP growth since 1996 (Figure 2) and argue that Europe’s “bank-bias” as it prevails today may come from public support via subsidies borne by taxpayers, especially in the wakes of the financial crisis of 2007/2008 and the European sovereign debt crisis, under the too-big-to-fail (TBTF) or “whatever-it-takes” (Draghi, 2012a) umbrella (by contrast, the Federal Deposit Insurance Corporation – or FDIC – in the past has been quite keen on resolving and shutting down failing banks in the US) as well as from political support. The former could implicitly lead to higher M&A activity in order to increase an institution’s market capitalization to effectively obtain bailout guarantees while the latter could mean shielding national banks from foreign competition since parts of the banking system may be publicly owned (like savings banks or regional banks in Germany).

Complementing the TBTF argument, Steinruecke (2017) finds evidence that during the GFC and the European sovereign debt crisis bailout guarantees have played a major part for investors’ expected returns, especially when having a large market capitalization. Additionally, she states that post-crisis evidence also hints at a continuation of bailout guarantee influence but alludes to an interpretation with caution due to results that were less strong.

Considering those findings raises the question if and how government support and regulation have efficiently contributed to a more stable and sound environment. In that sense, the impact of the GFC on the US and European banking system and economy was quite unique, which is important to scrutinize before taking a look at the resolution actions undertaken by both entities, for the simple reason that – even if the causing epicenter was the same – the tools used to cope with the aftermath of the crisis were quite different due to the very divergence described above.

3. Economic impact of the GFC

Before I mention the explicit effect on Europe, I want to briefly recap a few of the most important happenings during the build-up and burst of the housing bubble in the US which has been acknowledged as the culprit of the crisis, together with sub-prime mortgages and credit-default swaps (CDS).

In their review of the causes, effects and implications of the financial crisis Arestis and Karakitsos (2013) take an even larger step back and argue that financial innovation emerging from lax regulation and oversight by the respective supervisors is a root cause for the incurrence of the crisis: Financial institutions could switch parts or entire sections of their loan portfolios from the typical “originate-and-hold” paradigm where banks’ loans are kept in their own loan portfolios, appearing as bank native loans within their balance sheets, to an environment of “originate-and-distribute” where loans were repackaged and externally sold to other institutions in the form of asset-backed securities (ABS), transferring the risk from the original lender to the buyer of the ABS. According to the authors, this process of repackaging did not necessarily happen via the banks’ own corporate identity but through so-called Structural Investment Vehicles (SIV), which were legally split off in form of trusts or LLCs and effectively created the less regulated shadow-banking system. Those SIVs (with little equity proportions²) then funded itself with the help of the (short-term) money market to gather, arrange and redistribute collateralized (long-term) debt obligations (CDO) from the parent company to national and foreign investors – it is indispensable to mention that a large proportion of said foreign investors were from Europe (Arestis and Karakitsos, 2013), causally bridging the gap between the origin of the GFC in the US and the spillover effect that manifested itself within the boundaries of the European Union. Furthermore, as long as the yield curve was not inverting, high commissions charged for such transactions locked

² The following explanations clearly show how low proportions of firm equity paired with high leverage in derivative contracts can become a severe issue in a systemic perspective. The fact that no initial margin requirement was needed when engaging in CDOs has been selectively criticized by Murphy (2008) and Whalen (2008).

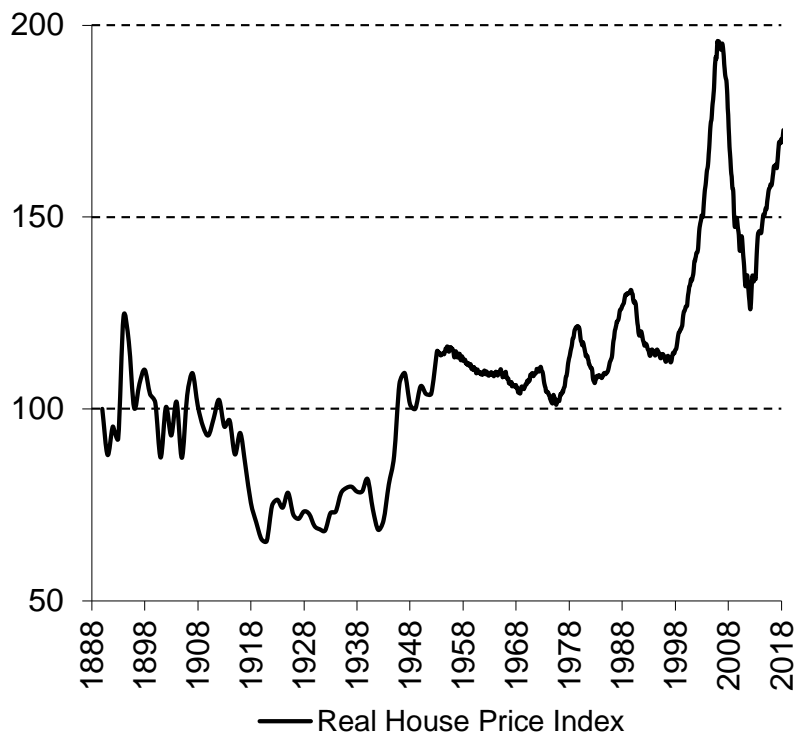


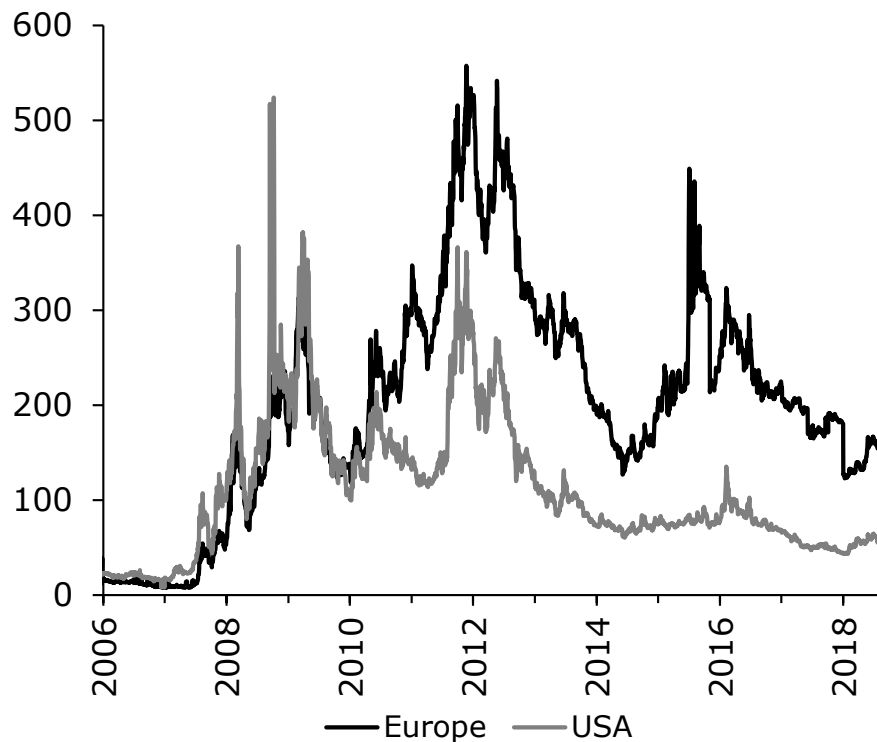
Figure 3: Robert Shiller Real House Price Index
(1890 = 100; source: data from <http://www.econ.yale.edu/~shiller/data.htm>;
last retrieved: 07.09.2018)

in high profits within the period of skyrocketing real estate prices as depicted in Figure 3.³

One complementing thing to note is that during times of surging asset prices banks experience a rise in firm equity value and collateral in their balance sheets which, in turn, leads to credit expansion. The proportion of top-rated (creditworthy) borrowers who need a loan diminishes over time due to supply penetration by the banks. This has two implications: First, due to the expansion of credit asset prices of banks increase even more, creating higher levels of leverage which in reverse can – and in case of the GFC did – lead to a downward liquidity spiral (“credit crunch”) and a potential dry-up. Secondly, since loan officers were rewarded based on the number of contracts they sell they tended to underprice risk in times of lean agent supervision policies and therefore turned to less creditworthy borrowers after the “higher-tier” customer

³ Growth of housing prices is adjusted for inflation using the Consumer Price Index provided by the US Bureau of Labor Statistics.

sector has been saturated – effectively granting loans for risky projects (or in this case sub-prime mortgages) and charging them too low of an interest rate (Langfield and Pagano, 2016).



*Figure 4: Aggregate daily CDS spreads (banking and insurance companies)
(basis points; source: data from Bloomberg L.P.; last retrieved: 13.09.2018)*

Subsequently, Murphy (2008) also examined how risk was compensated for when credit-default swaps were traded before the downturn and finds that not only the credit risk premium was too low (resulting only from pure mathematical and statistical models and not accounting for several important factors such as the upward adjustment of initially low “teaser rates” used in mortgage contracts and aspects of moral hazard that are linked to borrower behaviour) but also that there has not been any kind of compensation for systemic risk in form of a premium added on top.

Together with exploding asset prices, the linked leverage effect and the highly risky nature of credit-default swaps clearly shows the importance of the aforementioned topic of mispricing or underestimating default risk when looking

at CDS spreads closely before and during the GFC (Figure 4) which also escalated rapidly around the third quarter of 2008 (and several times again during the sovereign debt crisis in Europe).

The topic of financial innovation being a major cause of the crisis, initiated by liberalization of the over-the-counter (OTC) market and off-balance-sheet (OBS) activities, has also been thoroughly discussed by Whalen (2008) such that he also notes that because of their highly synthetic nature CDOs were hardly comparable to each other. This, again, allowed pricing to be uncompetitive and insufficient in terms of risk compensation. A more sequential and catalogued description of the sub-prime crisis provided by Islam and Verick (2010) can be found in Table 1 below, affirming the absurd creation and exploitation of the shadow banking system in an unregulated market as mentioned above.

	Step	Risks
1.	Household borrows from the originator (broker or lending institution)	<ul style="list-style-type: none"> Asymmetric information – broker did not fully know the credit worthiness of the borrower Lax lending standards further deteriorated in 2004 and 2005 ('teaser' interest rates, no equity loans, no documents) In some states of the US, the mortgage contract is 'without recourse to the borrower' – i.e. households can walk away from the mortgage
2.	Originator sells the mortgage to another financial institution	<ul style="list-style-type: none"> Perverse incentives – Since the risk was sold on, originators had the incentive sell as many mortgages as possible (the 'originate-to-distribute' model)
3.	Financial institutions issue mortgage-backed securities (MBS)	<ul style="list-style-type: none"> MBS issuers (particularly the government-sponsored enterprises, Fannie Mae and Freddie Mac) transferred thousands of loans to structured investment vehicles (SIVs), an off-balance sheet special purpose vehicle (SPV), which allowed these institutions to avoid capital requirements (allowing greater leverage). These SIVs had to be brought back onto the balance sheet once securities were downgraded after the crisis started. Securities were separated into senior, mezzanine (junior) and non-investment grade (equity) tranches, but effective tranching relies on the assumption that proper risk analysis on the underlying assets was done (which was not the case). Mortgages were selected from geographically diverse areas but the risk of correlated default was much higher than predicted. Securitization increased rapidly since 2001, which was based on the growth in sub-prime and Alt-A loans.
4.	Private financial sector issues collateralized debt obligations (CDOs)	<ul style="list-style-type: none"> CDOs issuers purchased different tranches of MBS and pooled them together with other asset-backed securities (backed by such assets as credit card, auto, business, and student loans) CDOs 're-securitized' securities, allowing further re-distribution of risk (and hence, adding further complexity), converting some of them into new senior AAA-rated securities Investment banks were not supervised like commercial banks and thus were not required to adhere to capital requirements. These banks could borrow short-term and hold risky longer-term assets with low levels of capital or reserves.
5.	Growth in credit default swaps (CDS)	<ul style="list-style-type: none"> CDO issuers purchased CDS, which enabled them to receive AAA ratings. These purchases were not regulated as over-the-counter transactions.

Table 1: Development of the GFC
(source: Islam & Verick (2010), pp. 18f.)

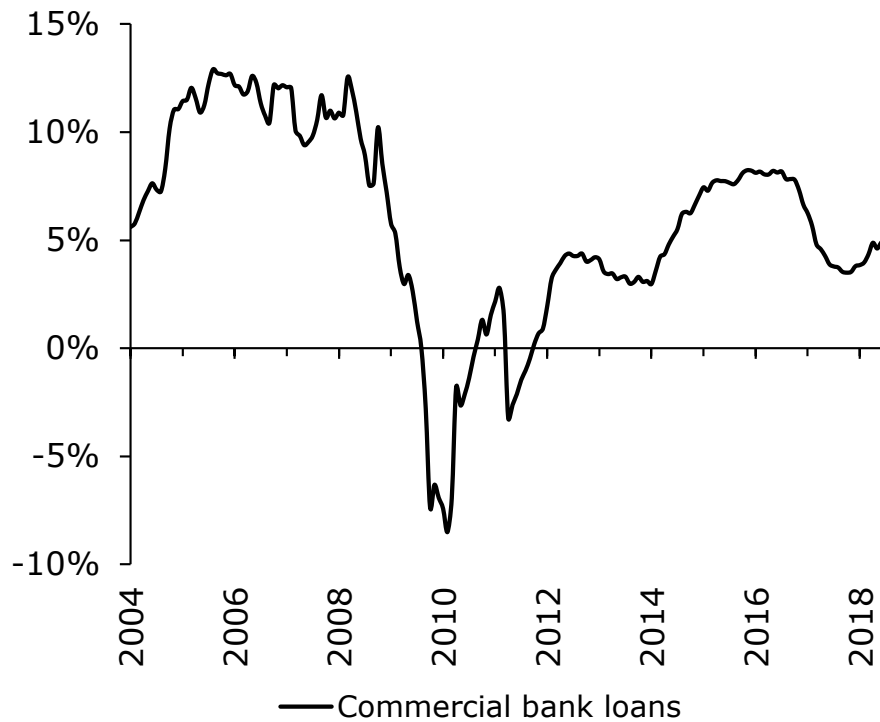


Figure 5: US Commercial bank loans and leases
(year-on-year change; source: data from Bloomberg L.P.; last retrieved: 27.08.2018)

Thus, it is no surprise that once the housing bubble arrived at its peak and burst every financial institution that was exposed to mentioned risks experienced the enormous backlash that brought the financial sector to a meltdown, including commercial and investment banks, real estate funds, insurance companies and hedge funds. The most prominent examples here would probably be companies like Freddie Mac, Fannie Mae (which alone represented more than US\$2 trillion of mortgages at the time; Ciro, 2016), AIG and, of course, Bear Stearns and Lehman Brothers. The predominant issue was that affected entities did not know the exact amount of risk exposure they exhibited, which lead many institutions to withdraw available liquidity from the market and to keep it as a safety buffer, initiating the start of the “liquidity concerning part” of the crisis (Arestis & Karakitsos, 2013). Supplementing the argument from above that high amounts of leverage can result in quick and dramatic dry up of funding liquidity because banks suddenly shy away from

handing out new loans, the growth rate of US commercial bank loans firstly hovered around ten to 15% year-on-year through the build-up of the bubble before plummeting quickly into negative territory, as shown in Figure 5.

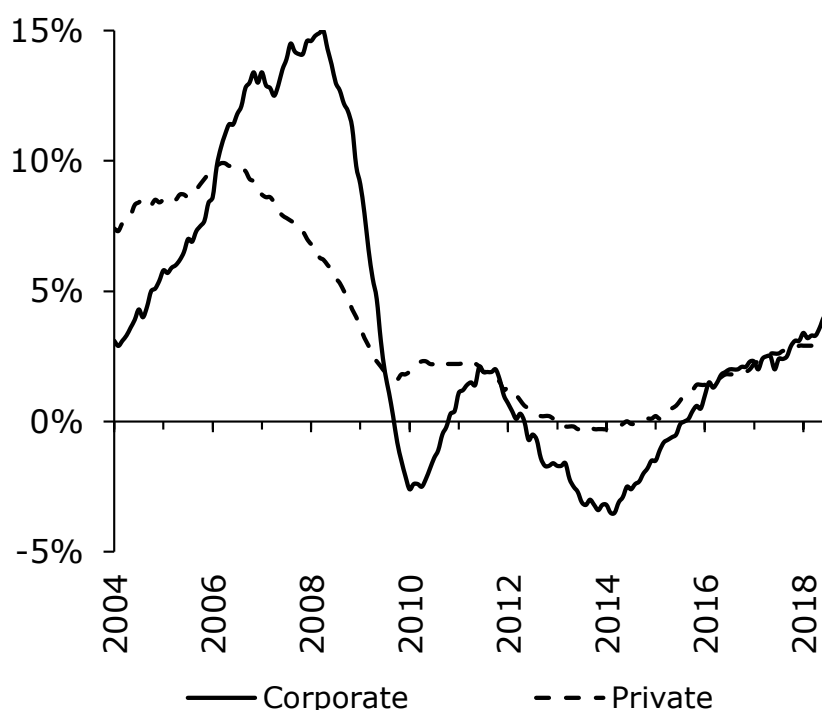


Figure 6: Euro area loans from MFIs to the corporate and private sector (year-on-year change; source: data from ECB SDW; last retrieved: 27.08.2018)

In that sense, the pathway concerning credit growth in Europe was pretty much the same. In addition to the fact that banks within the euro area expanded their lending activities before the crisis, as well, it seems fairly reasonable that they also experienced the repercussions resulting from the inherent leverage of their banking system. Figure 6 illustrates the growth of euro area lending from Monetary Financial Institutions (MFI) to Non-MFIs, specifically non-financial corporates and the private sector (including private households and non-profit institutions serving households) before the crisis, as well as the rapid slump and the persistently lower levels throughout the following decade. This observation is also backed by Jordà, Schularick and Taylor (2011) who have shown that recessions caused by (global financial) crises tend to have an adverse effect on

loan growth, supposedly for a longer period after the downturn. What is just as interesting in conjunction with such diminishing lending growth and funding liquidity, simultaneously serving the further analysis of the GFC's impact on Europe, is a set of factors introduced by Reinhart and Rogoff (2009) identifying three major characteristics that financial crises seem to have in common:

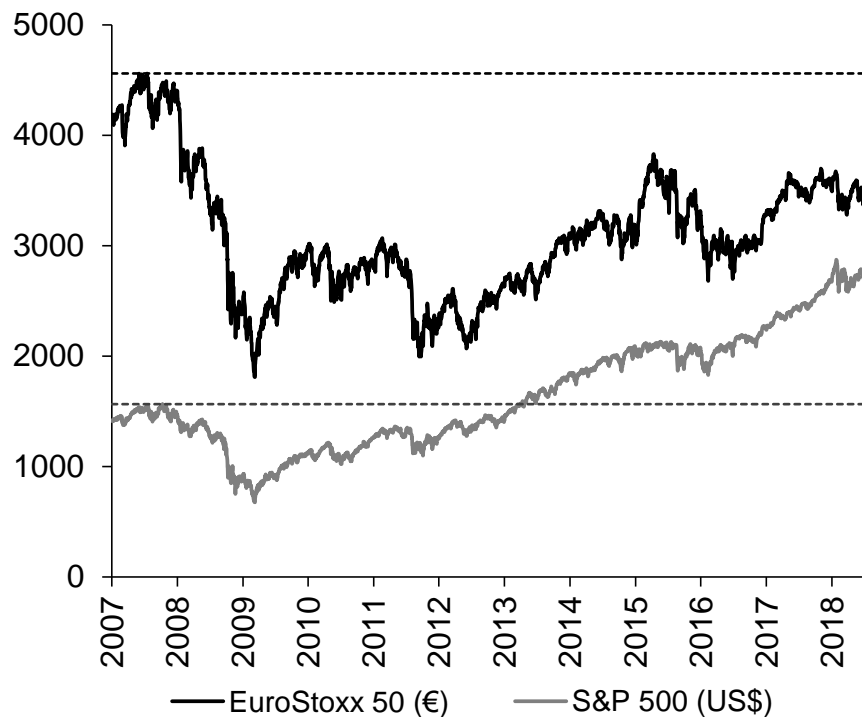


Figure 7: Daily prices of EU & US Stock Market Indices
(closing prices, LCY; source: data from Bloomberg L.P.; last retrieved: 24.08.2018)

The first one considers the degree of a subsequent asset market crash as very vigorous, often times lasting for several years, even more so for equity markets than for real house prices. Comparably, the US equity market – which is consensually represented by the S&P 500 Index – has roughly made an 82,9% return since its pre-crisis peak in October 2007 and around 323% from the trough in March 2009. However, the European benchmark – the EuroStoxx 50 Index – has not recovered above pre-crisis levels while it lost around 24,9% since its highest pre-crash mark in July 2007 and achieved a return of “only” 89,1% since its low in March 2009 (Figure 7).

Despite the fact that the widely mentioned “ever-lasting” bull run in the US has pushed its equity market way beyond the level of the 2007 watermark, it has taken almost five and a half years to get past this initial threshold. As mentioned before, the story of Europe continues to be a dampened one, not least because of the events that caused a second severe drag during the European sovereign debt crisis. In fact, the second and third factors quite appropriately capture effects that have resulted in major concerns for the euro area and which are still prevalent today.

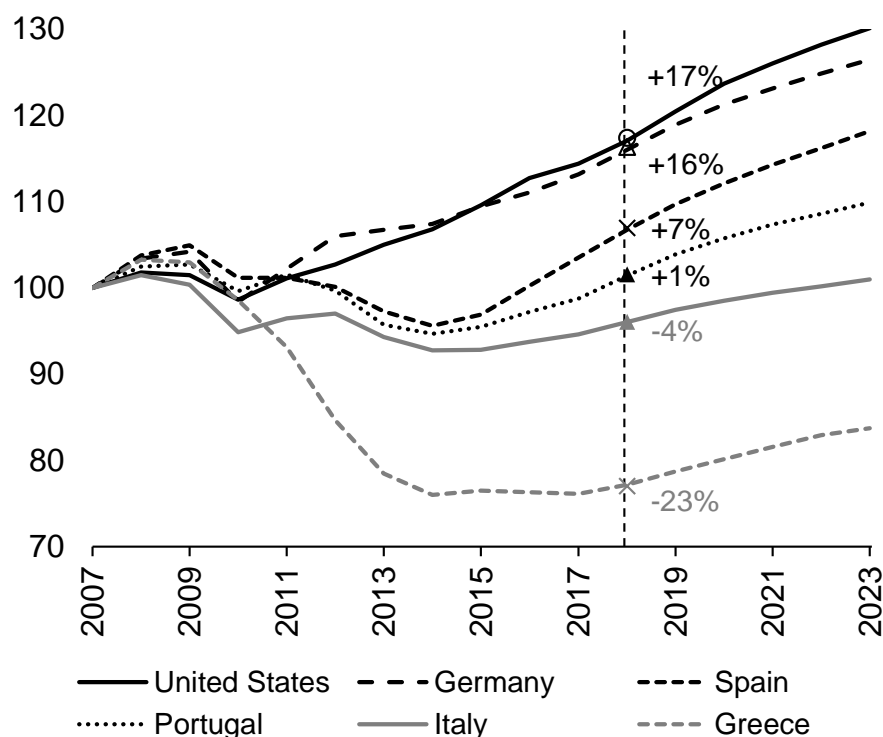
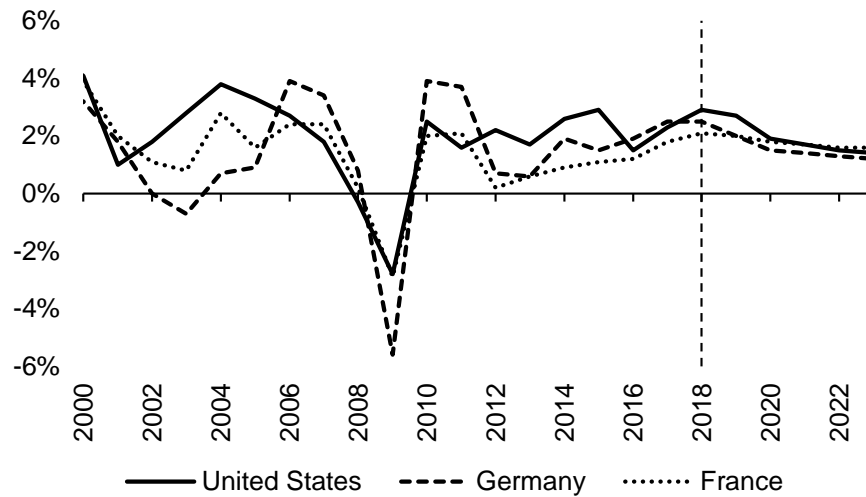


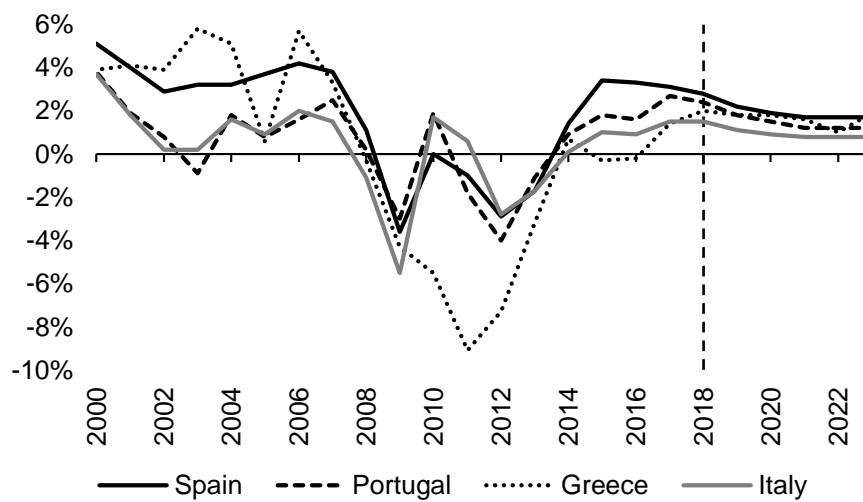
Figure 8: Real GDP growth (Index comparison)
(2007 = 100; source: data from IMF; after 2017 = IMF projections;
last retrieved: 23.09.2018)

So the second common factor is a consistent decrease in output and employment, something that clearly drove a wedge between the northern European countries and the southern periphery (Reinhart & Rogoff, 2009). Figure 8 highlights that, for example, Germany has recovered relatively positively from the crisis in terms of economic growth, ending up about 16% (as estimated by the IMF by the end of 2018) above its initial situation from 2007



and just slightly below the United States which show a projected total growth of 17%.

This is quite interesting since the trajectory of annual real GDP growth has evolved rather differently during the periods before and right after the crisis (Figure 9).



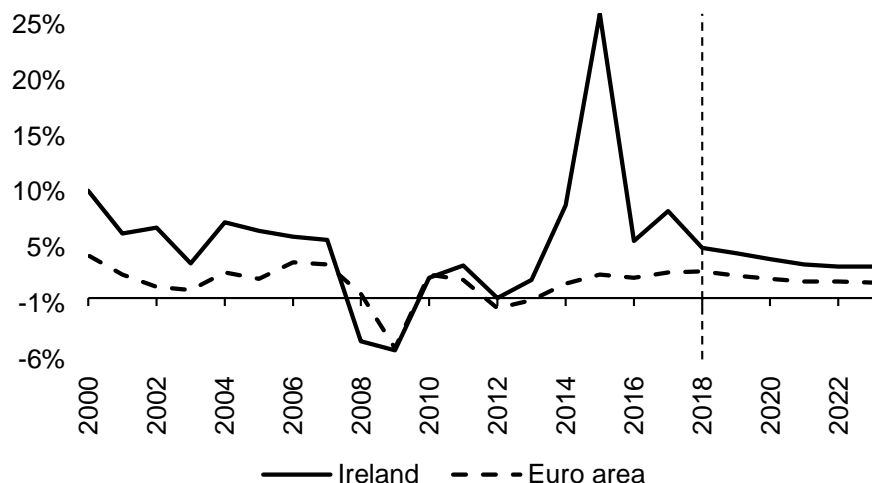


Figure 11: Real GDP growth [3]
 (year-on-year change; source: data from IMF; after 2017 = IMF projections;
 last retrieved: 23.09.2018)

Even more so, Figures 10 and 11 show that, out of the PIIGS country group, only Spain and Ireland managed to maintain a stable positive annual GDP growth in the years from 2000 until the beginning of the GFC. Additionally, Figure 10 clearly demonstrates that in contrast to Portugal, Italy and Spain the turmoil was not immediately over for Greece after 2009 as the Greek debt crisis came about to start, leaving it at a decline in real GDP of almost ten percent in 2011. As also seen in Figure 8, projections from the IMF for the end of 2018 expect Greece to exhibit a total growth deficit of -23% compared to pre-crisis levels, whereas Italy still falls short by a negative four percent and Portugal barely made its way into positive territory with around one percent by the end of the year (and there are several factors that additionally come in play which will be addressed in just a bit). Furthermore, Ireland's development historically has also been quite strong before the GFC, although the real effective exchange rate (REER, using GDP deflator data) provided by the European Commission (EC) shows that it reached the (unsustainable) peak of its national bubble already two years before the Lehman default with a significant price devaluation relative to the other European countries between 2007 and 2010 through

reductions in wage and (consumer) price levels (Figure 12). Sinn (2018) underlines that, in 2010, the initiation of the European Financial Stability Facility (EFSF) brought about a rather questionable halt in the drop, eradicating Ireland's need to further devalue due to the additional liquidity and financing available (more on this will be discussed in the next chapter).

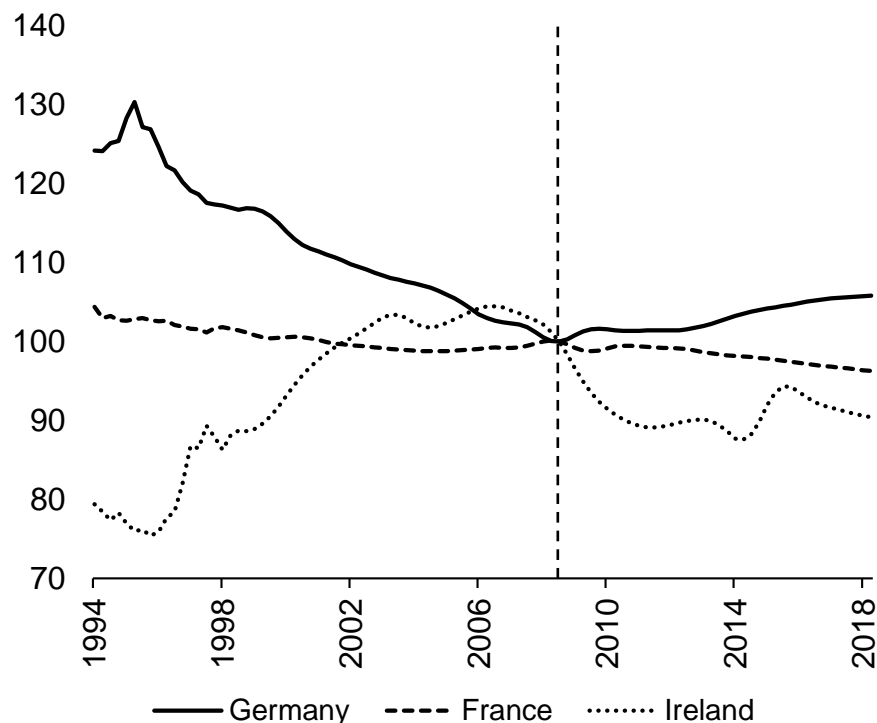


Figure 12: Real effective exchange rate [1]
(Q3 2008 = 100; source: data from European Commission; last retrieved: 22.09.2018)

One further thing to note is that the sharp increase in Ireland's real GDP growth of roughly 26% in 2015 as seen in Figure 11 before is due to the fact that large multinational companies have relocated their business operations and property to Ireland due to a favourable corporate tax environment. The issue of a misperception or anomaly has already been addressed by a statement of the Organisation for Economic Co-operation and Development (OECD) in 2016.⁴

Before approaching the other half of the second common factor introduced by Reinhart and Rogoff (2009), namely unemployment, I want to stress that

⁴ See <http://www.oecd.org/sdd/na/Irish-GDP-up-in-2015-OECD.pdf>; last retrieved: 19.07.2018.

Germany has become relatively cheap (and therefore more competitive) in relative valuation terms since the announcement of the Euro currency in 1995 up to the crisis in 2008 (Figure 12).

In contrast to Germany, the story looks rather inverse for Portugal, Italy, Greece and Spain:

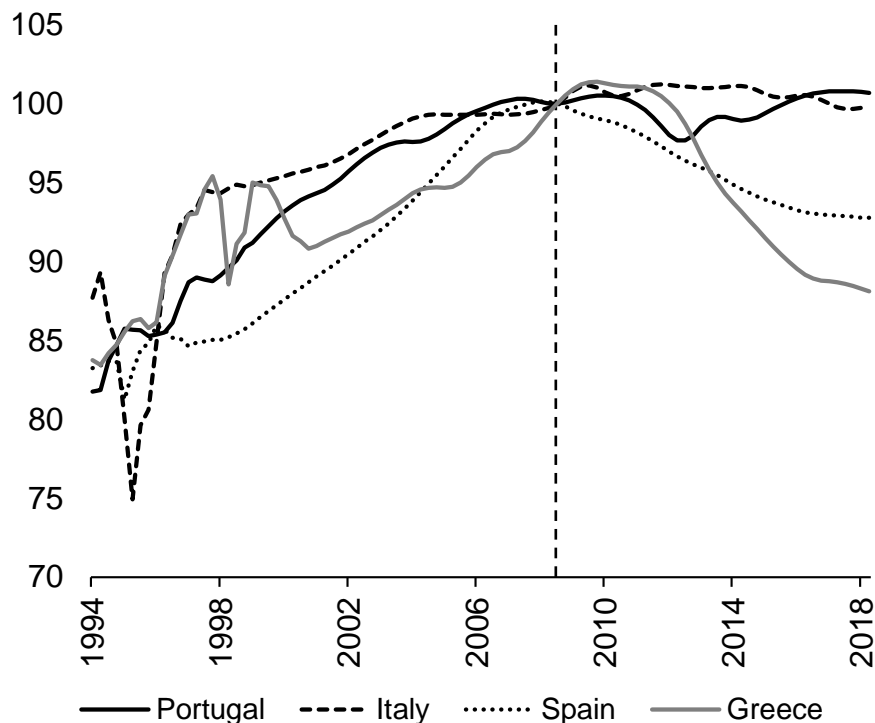


Figure 13: Real effective exchange rate [2]
(Q3 2008 = 100; source: data from European Commission; last retrieved: 22.09.2018)

During the inflationary period until 2008, all four countries have become relatively more expensive and lost a good fraction of their competitiveness (Figure 13), which did not help to reduce their current account deficits that were already quite large before the financial crisis, with the exception if Italy's (Figure 14) and only Greece and Spain have effectively devalued again since the crisis in real terms. On the side, Arestis and Karakitsos (2013) and Bagnai (2013) mention that core countries have reused their (in the case of Germany very notorious) current account surpluses to give out new loans to the periphery.

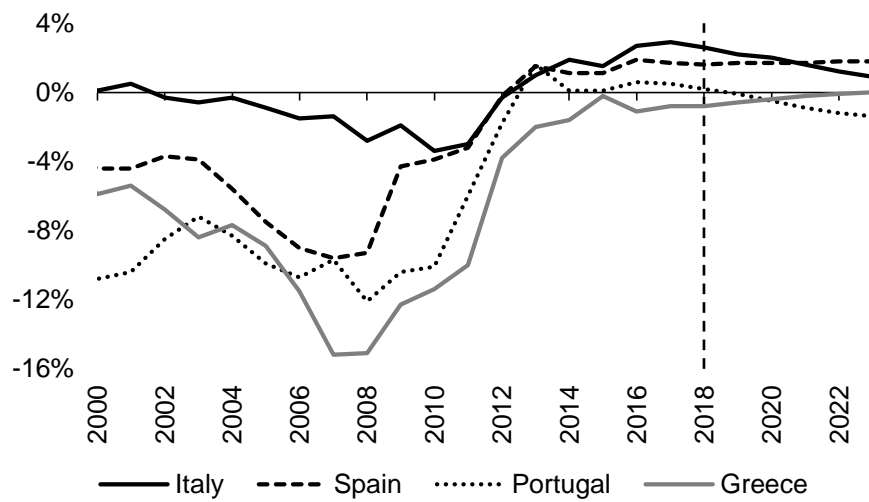


Figure 14: PIGS current account balance
(percent of GDP; source: data from IMF; after 2017 = IMF projections;
last retrieved: 23.09.2018)

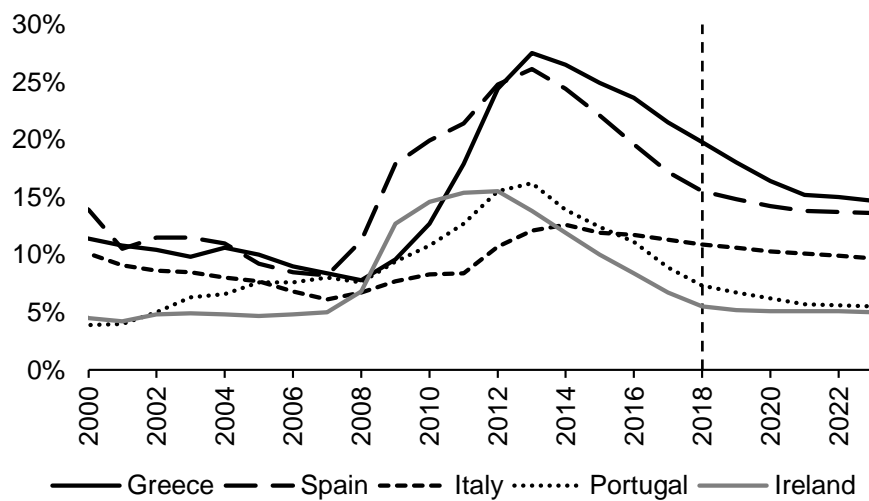


Figure 15: Unemployment rate [1]
(source: data from IMF; after 2017 = IMF projections; last retrieved: 23.09.2018)

As mentioned before, the second factor that financial crises have in common also includes a high rate of unemployment. As Figures 15 and 16 show, the PIIGS countries experienced a steep increase in unemployment beginning with 2008 with Greece leading the group at almost 28% through

2013, followed by Spain just two percentage points below. Those countries, of course, experienced a prolonged period of distress after the GFC ended for other economies like, for example, the United States due to the European sovereign debt crisis. As forecasted by the IMF, by the end of 2018 their respective rates will still be at almost 20% and 15,5%. Interestingly, the unemployment rate in the United States peaked at roughly nine percent in 2010, a level that has been almost “normal” for the Mediterranean states even before the crisis.

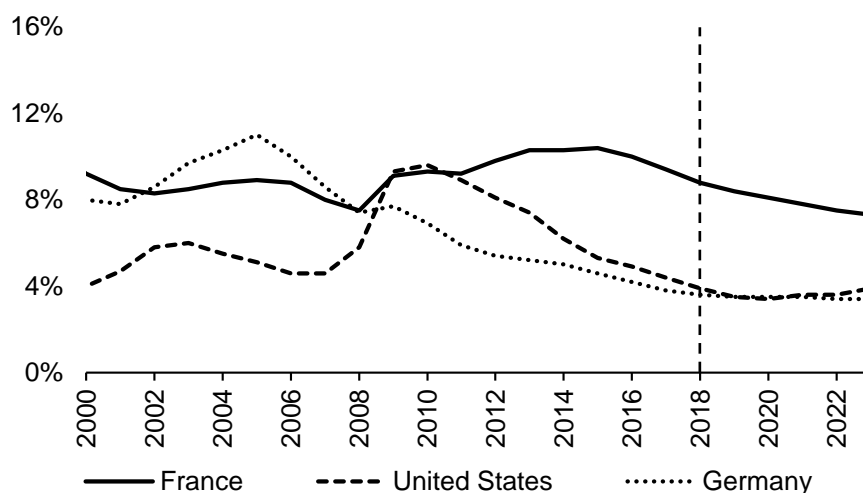


Figure 16: Unemployment rate [2]
(source: data from IMF; after 2017 = IMF projections; last retrieved: 23.09.2018)

From the “northern” countries within Europe France is the one that, even in 2018, still renders just a bit under a tenth of its workforce jobless, whereas Germany has registered a constant decline in unemployment not only throughout the years before the crisis but also during and after the GFC (the above mentioned split between European core countries and its periphery has also been pointly mentioned by Sneessens, 2016). Fujita and Gartner (2014) note that when comparing the United States and Germany with respect to the magnitude of real GDP decline in 2008 and 2009 (as shown before in Figure 9), Germany’s drop was more severe but unemployment was essentially no concern because of measures that were introduced like the short-term work

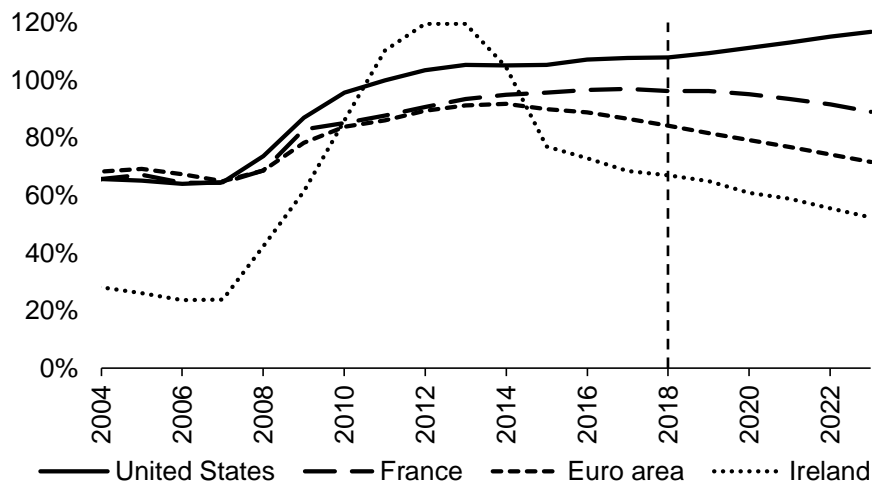


Figure 17: General government gross debt [1]
(percent of GDP; source: data from IMF; after 2017 = IMF projections;
last retrieved: 23.09.2018)

program where the government subsidises employees if their working hours have to be reduced, effectively reducing the amount of forgone earnings.

The last common factor Reinhart and Rogoff (2009) found describes rapidly increasing government debt, which is true for essentially every major member within the euro area, as well as for the United States (Figure 17).

As stated before, Ireland plays a bit of a special role because it devalued even before the GFC relative to the rest of the euro area (Figure 12) and in addition slipped into a high current account deficit between 2005 and 2009.⁵ Together with massive bailouts of Irish banks (via MBS purchases and liquidity assistance) and declining tax revenues due to a lack of economy growth those issues were spurring the need for extended government financing until it was also granted help by the IMF and the European Central Bank (Ciro, 2012; Sinn, 2018).

⁵ See <https://www.imf.org/external/datamapper/BCA@WEO/IRL>; last retrieved: 23.09.2018.

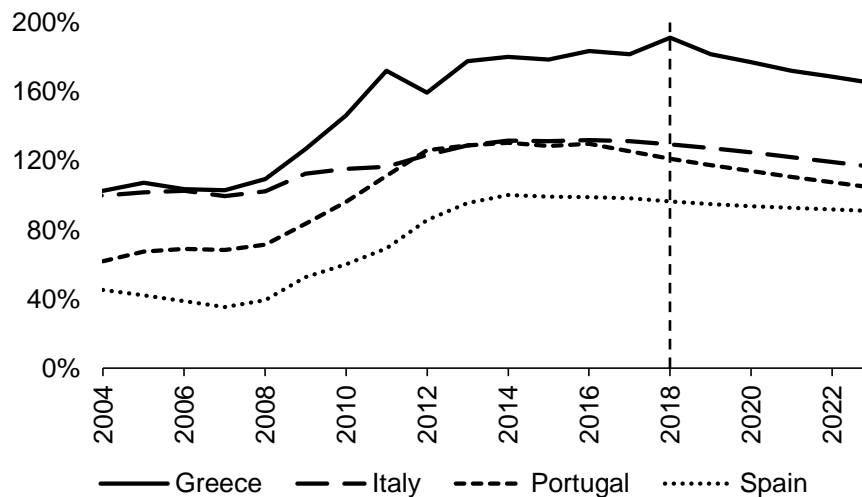


Figure 18: General government gross debt [2]
(percent of GDP; source: data from IMF; after 2017 = IMF projections;
last retrieved: 23.09.2018)

Closing the circle between the economic impact of the GFC and the burden that still lies within the European banking sector brings us to evidence that is vastly more concerning – especially for the topic of supervision and macroprudential regulation discussed in the next chapter – and should clearly argue that the remnants of the financial crisis that spilled over from the United States’ housing bubble are still existent today in form of high government debt ratios, non-performing loans within banks’ balance sheets and higher systemic risk. This is especially true for the southern European countries, with Greece beaconing with a change in general government gross debt from already over 100% of GDP before 2008 to a worrisome 172% in 2011 and to 191% by the end of 2018, as expected by the IMF (Figure 18). Furthermore, Spain has almost trippled in its government debt when comparing roughly 36% in 2007 to the peak of 100% in 2014, whereas Portugal nearly doubled from 68% to 131%, also from 2007 to 2014.

One last thing to note is that Reinhart and Rogoff (2009) argue that the major causality for steep increases in government debt does not stem from banking system bailouts but rather from the large breakdown of government revenue from tax receipts, spiking interest rates that render debt liabilities more expensive and costly countercyclical measures in fiscal policy.

Before moving on to the next chapter, I want to establish the link between mentioned government debt together with the pricing of sovereign risk and the emergence of the European sovereign debt crisis with respect to the banking system.

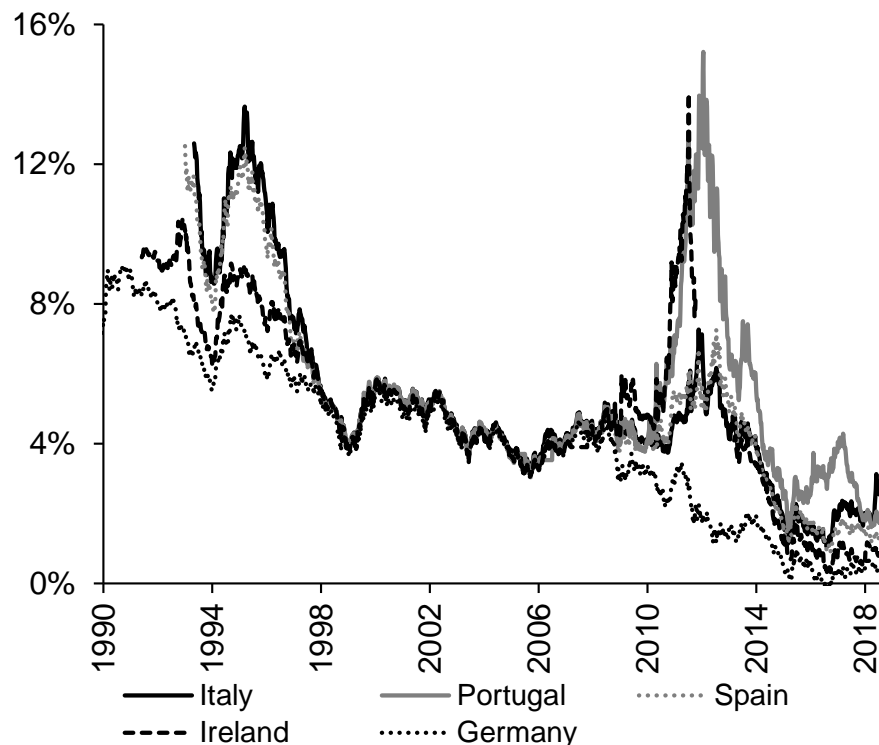


Figure 19: 10-year government bond yields [1]
(nominal; source: data from Bloomberg L.P.; last retrieved: 14.09.2018)

Breuss (2017), Moro (2016) and Sinn (2018) argue that the monetary unification through the introduction of the euro (and its announcement in 1995) had a convergence of interest rates on 10-year government bonds as a consequence. As Figure 19 shows, even before the physical distribution of the currency yields on Portuguese, Irish, Italian and Spanish government bonds became almost identical to German ones in 1998 (Greek bonds took a bit longer since they had a comparably higher initial level of roughly 25% in 1992 but eventually achieved to reduce the spread to German sovereign bonds around 2002; Figure 20). Moro (2016) and Véron (2011) criticise that policy choices made prior to the crisis have given euro-area countries the same low-

risk valuation as, for example, Germany and the possibility to refinance themselves to uniform and favourable conditions, no matter the solvency. Additionally, they emphasize that Europe's banking sector took on very questionable amounts of exposure to sovereign risk: Firstly, banks that purchased Eurozone government bonds – largely the one of their respective home country – were allowed to set a risk-weight of zero for those bonds for their regulatory capital assessment. Secondly, in the upswing period before the crisis policymakers did not pursue actions to incentivise the reduction of the then cheaply valued general government debt.

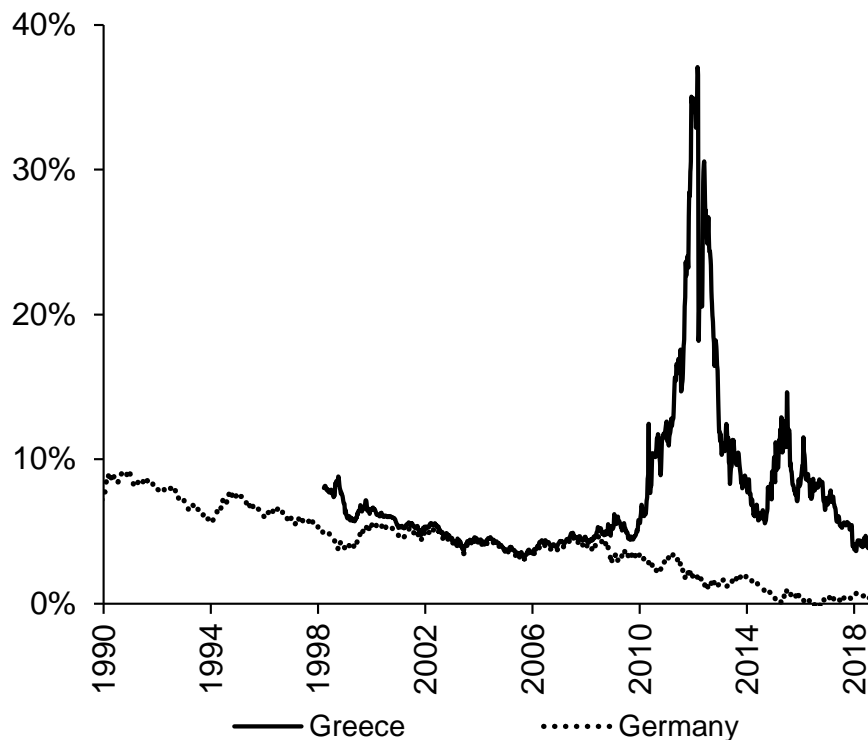


Figure 20: 10-year government bond yields [2]
(nominal; source: data from Bloomberg L.P.; last retrieved: 14.09.2018)

Conversely, together with markets that subsequently overpriced risk in the wake of the crisis as the panic began, the toxic pair of high burdens of debt with spiking risk premia has weakened the financial system to a point where conventional policy and regulation might no longer be sufficient, which will be now discussed in the following chapter.

4. Responses: Assistance, monetary policy and macroprudential regulation

The following section will address the actions that were taken to prevent a further collapse of the financial system and to overcome the GFC, as well as the various changes that have been made in the light of regulatory adjustments and the policy instruments that both the Federal Reserve and the European Central Bank had to establish to avoid a liquidity trap, to stimulate the economy out of a recession and to reassure confidence in the financial system.

Beforehand, I want to briefly go over some of the relevant literature that discusses the above mentioned topics by starting with the ones that came into existence quite timely after the downturn in 2008 – some of which targeted (liquidity) assistance on the short-term side – and progressively working towards the more recent solutions (as for Europe, those also heavily consider the ramifications of the sovereign debt crisis). Afterwards, I will discuss most of these findings in a more detailed manner.

First of all, there is a lot of coverage throughout academic literature about immediate (fiscal) interventions right after the GFC. Some papers, for example, are more focused on the United States and discuss implementations like the Emergency Economic Stabilization Act of 2008⁶ – which includes the Troubled Assets Relief Program (TARP; Ciro, 2016; Elson, 2017; Malliaris, Shaw & Shefrin, 2016; Tatliyer, 2017), the American Recovery and Reinvestment Act of 2009 (Zestos, 2015), the initiation of the “Volcker Rule” (Arestis & Karakitsos, 2013) or the enactment of the Wall Street Reform and Consumer Protection Act, widely recognized as the Dodd-Frank Act (Guaccero, 2017; Kuzucu, 2017; Turk, 2018).

On the other hand, there are several authors that have specialized on the European perspective, not only because the financial crisis of 2008 has had an impact on Europe, but also the subsequent sovereign debt crisis that emerged as a remnant of the GFC and, therefore, brought about a totally different ramification that required to be dealt with by domestic and international

⁶ See <https://www.congress.gov/bill/110th-congress/house-bill/1424>; last retrieved: 28.08.2018.

authorities. Direct measures implemented by the EU around 2008/2009 are, for instance, the European Economic Recovery Plan (Sneessens, 2016), the European Banking Communication issued by the European Commission together with retail depositor guarantee schemes (Boccuzzi & De Lisa, 2016; Ciro, 2016; Guaccero, 2017), the European Framework for Action (Jackson, 2010) or the first round of the Covered Bond Purchase Program (CBPP) which was supplemented in 2014 by the Asset-backed Securities Purchase Program (ABSPP; Lombardi & Moschella, 2016) and eventually channeled into the ECB's Extended Asset Purchase Program (EAPP), or quantitative easing (QE) program, by March 2015.⁷ Despite various actions that were timely taken, Breuss (2017) has criticized that the responses by the European Central Bank exhibited a non-negligible delay compared to the Federal Reserve.

Further literature sets its focus on mechanisms and policies that emerged as the scope of the consequences after Lehman became clearer and it was mutually accepted that short-term intervention could not resolve the issues that manifested itself within Europe's financial sector. This, in turn, was the birth of several tools and institutions that became essential in the handling of the crisis on a long-term basis: Two selected works, namely by Montanaro (2016) and by Schoenmaker and Véron (2016), nicely draw a picture of Europe's concept of banking union with respect to its regulatory and supervisory architecture, both with forward looking remarks on the current status of said banking union. Some of the major components under Europe's regulation and supervision umbrella which they examine are, for instance, the Single Rulebook, the European Banking Authority (EBA), the Single Supervisory Mechanism (SSM) and Supervisory Review and Evaluation Process (SREP), the European Stability Mechanism (ESM) or the Bank Recovery and Resolution Directive (BRRD) and the Single Resolution Mechanism (SRM). Later in this chapter, such tools will also be discussed more in detail.

Furthermore, a topic that has grabbed attention since the GFC is about the (interbank) payment system TARGET2 which exhibit a strong divergence between "core" countries like Germany, Luxembourg or the Netherlands and

⁷ See <http://www.europarl.europa.eu/EPRS/EPRS-Briefing-548976-The-ECBs-EAPP-FINAL.pdf>, last retrieved: 25.09.2018.

countries of the European periphery like Italy and Spain. This divergence is thoroughly discussed by Moro (2016), Rossi (2017), Sinn (2018) and Steiner (2016).

Lastly, both the Federal Reserve as well as the European Central Bank – well aware of their impact on financial markets – have tried to address the issue of market volatility when it comes to the disclosure of their interest rate (or, in general, policy) decisions since market participants are closely following their official statements even down to their wording to make future decisions (for example, by changing their portfolio constellation to decrease or increase its overall duration). The risk of an overreaction by investors due to a mismatch of their expectations and the central bank’s potential “surprise announcement” (especially during times of elevated market volatility) has been included in the Fed’s and ECB’s so-called Forward Guidance principle, which is discussed by Breuss (2017), Lucca and Moench (2015), Gilbert, Kurov and Wolfe (2018) and Leombroni, Vedolin, Venter and Whelan (2018).

4.1. Immediate assistance

On September 7th 2008, one of the first responses to the GFC on the US side has been US Treasury Secretary Henry Paulson's decision to bail out the two housing agencies Fannie Mae and Freddie Mac for a gross total of about US\$188 billion. However, paid out dividends reduced the amount to US\$124 billion (Zestos, 2015). On September 16th, just one day after the investment bank Lehman Brothers filed for bankruptcy, Paulson then took action together with the Federal Reserve (and their own funds) to rescue and nationalize the insurance behemoth American International Group (AIG) with an initial US\$85 billion (Elson, 2017), all under the TBTF argument. In the end, the amount of the bailout allotted to US\$182 billion (Lindsey, 2016). All three companies had large exposures to the collateralized debt obligations and the high-risk component that come with them, as explained in the previous chapter, rendering them pretty much helpless as they tried to remain solvent in the months before the government intervention.

On September 29th, the US Congress first faced a negative vote for a large emergency package for the banking sector. Nevertheless, the Congress eventually approved the so-called Emergency Economic Stabilization Act (EESA) of 2008, which was then signed a few days later on October 3rd. A major instrument of the EESA is the Troubled Assets Relief Program:⁸ The main intention of the TARP was to establish a mechanism that shielded the US economy from (further) damage caused by toxic MBSs by allowing the US Treasury to purchase them from affected financial institutions for an initial US\$700 billion in order to draw them out of the banking system, although only around US\$457 billion has been actually used (Table 2).⁹

⁸ Bassan and Mottura (2015) comparably state that such an intervention would not have been possible in Europe's case due to legal restrictions and lacking unification of the economy.

⁹ For more recent figures see (1) the *Monthly TARP Update* as of October 2018 and (2) the *Monthly Report to Congress* as of September 2018:

(1) https://www.treasury.gov/initiatives/financial-stability/reports/Documents/Monthly_TARP_Update%20-%2010.01.2018.pdf, last retrieved: 01.10.2018.

<i>Name</i>	<i>Type</i>	<i>Amount allocated</i>	<i>Amount received</i>	<i>Amount returned</i>
AIG	Insurance company	67.84	67.84	67.84
General Motors	Auto company	51.30	51.30	38.99
Bank of America	Bank	45.00	45.00	45.00
Citigroup	Bank	50.00	45.00	45.00
JPMorgan Chase	Bank	25.00	25.00	25.00
Wells Fargo	Bank	25.00	25.00	25.00
Goldman Sachs	Investment firm	10.00	10.00	10.00
GMAC (Ally Financial)	Private bank holding company	16.29	16.29	8.17
Chrysler	Auto company	12.37	12.37	9.44
Morgan Stanley	Bank	10.00	10.00	10.00
Totals		312.8	307.80	284.44
All other companies		143.76	114.13	83.40
Total TARP		456.56	421.93	367.84

*Table 2: Allocation of TARP funds
(in US\$ billions; source: Zestos, 2015, p. 102)*

On the side, the fact that those rescue packages have been stemmed by taxpayer's money was one of the reasons why it did not directly make its way through Congress at first (Ciro, 2016). Yet, it is only with hindsight that we can say that taxpayers have gained some benefits out of a decade of returning cash flows to the government. Additionally, Zestos (2015) points out that the EESA had the potential to create a source of larger systemic risk, for it lead to acquisitions of smaller failing banks by larger holding companies or other financial institutions.

Just about a few months later, the United States provided its economy with another stimulus package, namely the American Recovery and Reinvestment Act (ARRA) of 2009, signed into law by February 17th, 2009. This Act included a US\$787 billion injection for selected sectors of the economy, while the majority of the funding effectively were tax cuts (Islam & Verick, 2010).

(2) <https://www.treasury.gov/initiatives/financial-stability/reports/Documents/2018.08%20August%20Monthly%20Report%20to%20Congress.pdf>, last retrieved: 01.10.2018.

By the end of the year, the Dodd-Frank Wall Street Reform and Consumer Protection Act was proposed and was finally signed into law on July 21st, 2010.¹⁰ The Act contains a large amount of regulations, but the most important implementations tried to seek more transparency and investor protection in OTC markets (especially addressing derivatives), to stop bailouts of financial institutions that have been categorized as TBTF at the taxpayers' expenses, to reduce systemic risk and to organize the liquidation of said institutions via the Federal Deposit Insurance Corporation (Lindsey, 2016; Turk, 2018).¹¹

On the European side, the first timely intervention by the European Commission was to announce the first Banking Communication on October 13th, 2008, setting the first round of rules concerning the state aid for bank bailouts on a national level (Guaccero, 2017).¹² More precisely, domestic banks within the EU member states were provided with a retail deposit guarantee scheme. Those guarantees were initially capped at €20.000 and successively increased to €100.000 (Boccuzzi & De Lisa, 2016). Additionally, the European Commission published the first guideline on bank recapitalization in order to restore stability, improve transparency and reduce potential future systemic risk (Ciro, 2016).¹³ Shortly after, on October 29th, the European Commission released yet another measure called the European Framework for Action, which declared a more dynamic approach of how short-term and long-term achievements should be aligned with each other.¹⁴ This, eventually, was followed by two major interventions regarding the financial system that arguably represent the equivalent of the TARP, albeit at a much lower magnitude compared to the United States:

¹⁰ See <https://www.congress.gov/111/plaws/publ203/PLAW-111publ203.pdf>, last retrieved: 14.08.2018.

¹¹ According to the FDIC, over 500 institutions have failed during the last decade.

See <https://www5.fdic.gov/hsob/HSOBSummaryRpt.asp?BegYear=2008&EndYear=2018&State=2&Header=1>, last retrieved: 01.10.2018.

¹² See [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009XC0115\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009XC0115(01)&from=EN), last retrieved: 01.10.2018.

¹³ See http://ec.europa.eu/competition/state_aid/legislation/recapitalisation_communication.pdf, last retrieved: 01.10.2018.

¹⁴ See <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52008DC0706&from=EN>, last retrieved: 01.10.2018.

Firstly, on November 26th, 2008, the European Economic Recovery Plan (EERP) was proposed (and eventually signed by the European Council in December that year), providing €200 billion for international projects that should invest in renewable energy, infrastructure and telecommunication services (Jackson, 2010).¹⁵

Secondly, a follow-up of the Banking Communication proposal further complemented the plan starting from February 25th, 2009, namely the Treatment of Impaired Assets Communication by the European Commission.¹⁶ This measure should also reassure confidence the financial sector by establishing more transparency regarding the valuation and location of impaired assets within the European banking system and provide a guideline on how to proceed with impaired asset relief (Ciro, 2016).

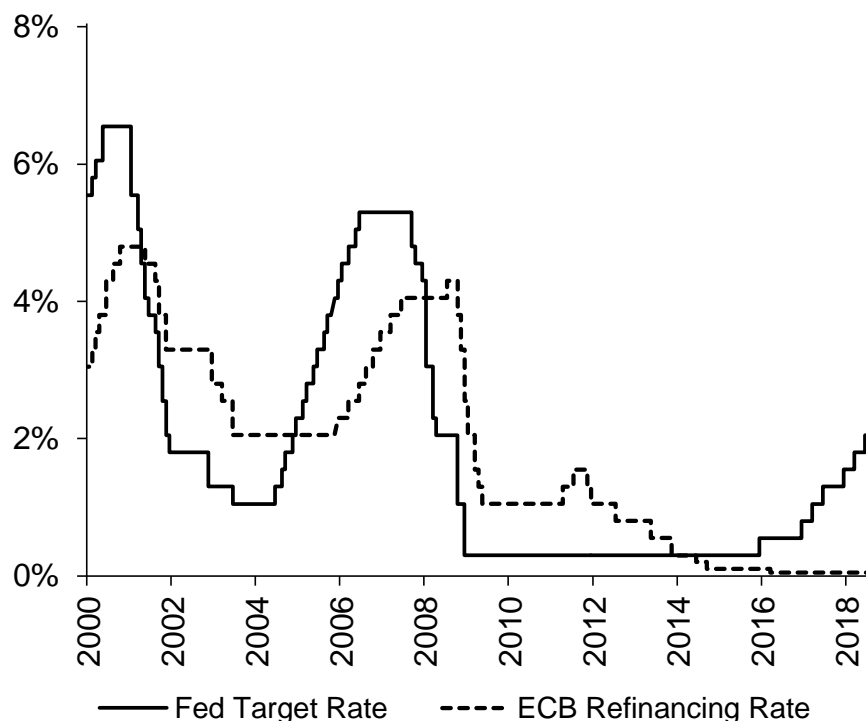


Figure 21: Central bank policy rates
(nominal; source: data from Bloomberg L.P.; last retrieved: 22.08.2018)

¹⁵ See http://ec.europa.eu/economy_finance/publications/pages/publication13504_en.pdf, last retrieved: 01.10.2018. For a more detailed view of further economic stimulus packages see Jackson (2010), Table 4, pp. 51ff.

¹⁶ See http://ec.europa.eu/competition/state_aid/legislation/impaired_assets.pdf, last retrieved: 02.10.2018.

Lastly, as a component of their conventional monetary policy instruments the European Central Bank and the Federal Reserve (as well as the Bank of Canada, the Bank of England, Sweden's Riksbank and the Swiss National Bank; Jackson, 2010) have contemporaneously cut interest rates on October 8th, 2008, by 50 basis points (Figure 21). As mentioned above, Breuss (2017) criticized the delay that the ECB showed in comparison with the Fed, since the Federal Open Market Committee (FOMC) decided to cut interest rates by 50 basis points for the first time already on September 18th, 2007, anticipating a potential correction that might result after an overheating housing market, not least because mortgage contracts were characterized by variable rate policies.¹⁷ Tomann (2017) additionally notes that the ECB had even raised interest rates on July 3rd, 2008, by 25 basis points to 4,25% over inflation concerns before eventually following the Fed's path of interest rate cuts. After several steps, the last "large" reduction (of 75 basis points) in the United States was in December 2008 and one of 50 basis points in January 2009 for the Eurozone, respectively. It should be noted that in March 2016, the European Central Bank has set its Main Refinancing Rate to zero, whereas the Federal Reserve has started its tightening cycle just a bit earlier in December 2015 (more on the current status of the Fed's tightening in conjunction with spiking housing prices will be later discussed in the outlook chapter).

¹⁷ See <https://www.federalreserve.gov/newsevents/pressreleases/monetary20070918a.htm>, last retrieved: 02.10.2018.

4.2. Unconventional monetary policy

At the 18th Annual Hyman Minsky Conference in 2009, Janet Yellen (2009) has addressed the fact that (financial) bubbles might be difficult for a monetary policymaker to foresee. Then, after the market had collapsed and conventional monetary policy, as described above, hit a critical threshold, the central banks had to decide how to proceed. This threshold is described as the zero lower bound problem or – together with high unemployment and a significant output gap – a liquidity trap: As nominal (short-term) policy interest rates drop down to zero (or very close to zero), increasing the money supply in the economy beyond the current point even more loses its accommodative power, failing to promote consumer spending and output (Malliaris, Shaw & Shefrin, 2016). This leaves central banks with very few options to continue their path, creating the need for additional, “unconventional” monetary policy instruments such as quantitative easing, or QE. Under the QE program the central banks can buy assets on the secondary market, including not only treasury bonds but also corporate commercial papers or bonds and MBSs in order to spur consumption and to avoid deflation. As shown in Figure 22, the Fed had conveyed its first program between 2008 and 2010, while the second phase bridged the gap of still sluggish growth until 2012. Then, the latest QE program was initially set up with US\$40 billion of MBS purchases for an unlimited time and amount but was eventually brought to a halt in October 2014, where the Fed’s balance sheet amounted to a massive US\$4,5 trillion.¹⁸

¹⁸ See <https://www.stlouisfed.org/publications/regional-economist/third-quarter-2017/quantitative-easing-how-well-does-this-tool-work>, last retrieved: 25.09.2018.

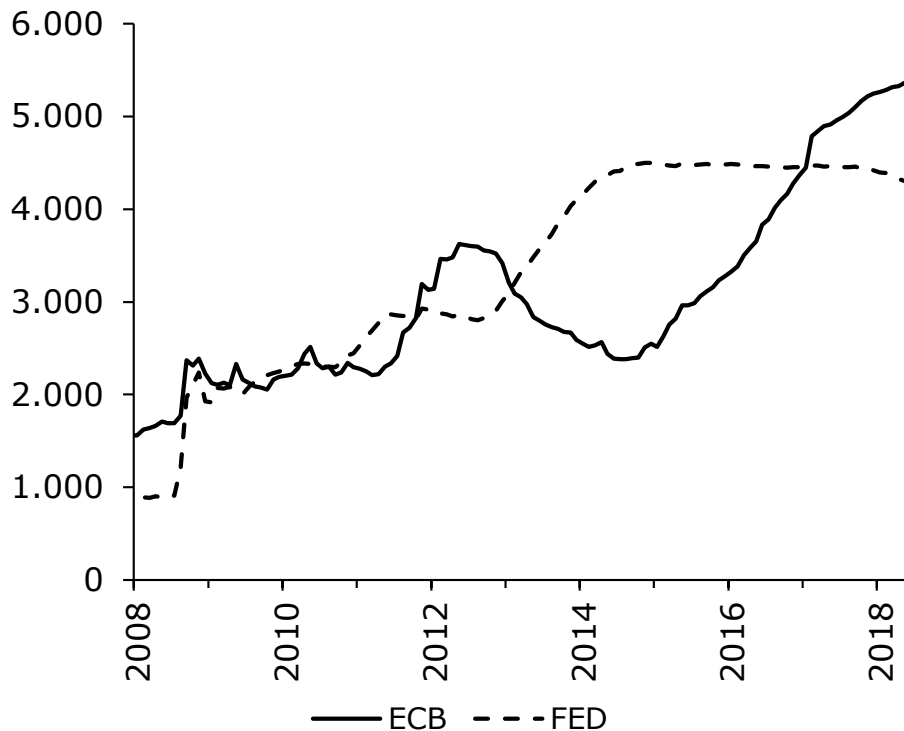


Figure 22: Central Banks' total assets
(US\$ billions; source: data from Bloomberg L.P.; last retrieved: 01.09.2018)

On the other hand, the European Central Bank had also decided to make use of this instrument – although, for example, Trichet (2010) has noted that the following two measures should not be confused with quantitative easing, reaffirming that the ECB still strictly followed its mandate within the given legal boundaries. From May 2010 until September 2012, the ECB established the Securities Markets Program (SMP) with an overall size of €223 billion. After the sovereign debt crisis hit, it became clear that the SMP would not have the right framework to fit the necessary requirements. This was the time when the ECB initiated its Outright Monetary Transactions (OMT) program which had no initial limits or boundaries like the SMP (Lombardi & Moschella, 2016). After the interest rate for Greek government bonds had spiked to nearly 40%, the OMT had an immediate effect (also on Italy and Spain) since it effectively provided investors with a costless CDS insurance for the troubled euro area bonds (Sinn, 2018). Nevertheless, it was ensured that the mechanism was not used irresponsibly (Draghi, 2012b). Additionally, it was unclear whether the OMT

program would be enough to fight deflation fears that started around 2012, so the central bank introduced its ABSPP and the third round of the CBPP in June 2014 (Tomann, 2017). Furthermore, the ECB complemented the two initiatives with its Targeted Long-term Refinancing Operations (TLTRO) to enhance lending from banks to non-MFIs (Mendoca, 2017). Just about six months later, the ECB announced its Expanded Asset Purchase Program on January 22nd, 2015 – effectively the ECB’s own QE program – which was implemented by March 2015.¹⁹ Each central bank then bought back their respective domestic government bonds, according to a capital key provided by the European Central Bank. Since those purchases are conducted with fresh (base) money from national printing presses, it eventually increased the monetary base from roughly €1,5 trillion to around €3,5 trillion in early 2018 (Sinn, 2018).

¹⁹ See https://www.ecb.europa.eu/press/pr/date/2015/html/pr150122_1.en.html, last retrieved: 02.10.2018.

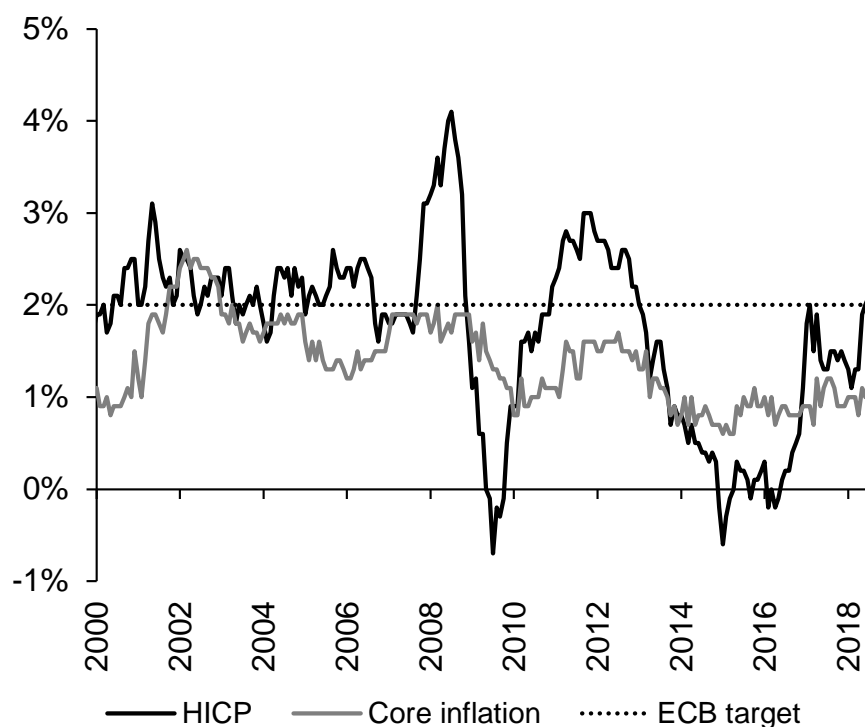


Figure 23: Euro area inflation (HICP)
(year-on-year change; source: data ECB SDW.; last retrieved: 03.09.2018)

Concerning the effectiveness of the program, Demertzis and Wolff (2016) argued that it was still too early to evaluate the central bank's QE success with respect to its effect on the ECB's inflation target of two percent back in June 2016. As Figure 23 shows, the Harmonized Index of Consumer Prices (HICP) for the euro area indeed reflected deflation concerns that were prevalent at the time (with Cyprus having the strongest deflation at -2,2%; Breuss, 2017), although inflation has picked up over the last two years and remained hovering quite calmly around the central bank's target since May 2018.

As of the beginning of 2018, the ECB has cut the amount of its monthly asset purchases down to €30 billion which was followed by another reduction down to €15 billion after September 2018. It is planned that no more net purchases will be made starting in 2019. Just for reference, the average amount of monthly net purchases the ECB had made allotted to €60 billion between March 2015 and March 2016 and €80 billion between April 2016 and March

2017.²⁰ By comparison, the balance sheet of the European Central Bank has grown to a staggering US\$5,4 trillion as of September 2018. Since asset purchases are said to be stopped soon, market participants will be carefully monitoring the central bank's interest rate decisions during the next year. It would not be farfetched to expect the ECB to follow the Fed's move and gradually raise interest rates in late 2019 if economic conditions are favorable and inflation expectations are met, although the current stand of the ECB's Governing Council (as of September, 2018) foresees no deviation from present interest rate levels until at least summer 2019.²¹

²⁰ See <https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html>, last retrieved: 27.08.2018.

²¹ See <https://www.ecb.europa.eu/press/pr/date/2018/html/ecb.mp180913.en.html>, last retrieved: 03.10.2018.

4.3. European banking union

As mentioned in chapter 4.1, the banking industry had to face several important changes when it comes to regulation, such as the Dodd-Frank act in the United States but also recommendations made by the Vickers Commission in the UK and guidelines proposed by the so-called High-level Expert group on reforming the structure of the EU banking sector, known as the Liikanen report (named after its chairman, Erkki Liikanen).²² This, in part, is a consequence of the changing behaviour of commercial banks that shifted from earning their profits mostly via interest margins over to increasing their operational share in securities trading, insurance provision and investment banking (Monyneux, 2016). This was due to the increasing competition that resulted from an industry-wide liberalization, starting roughly from the 1980's and significantly bringing down interest margins. Thus, it comes as no surprise that after the GFC regulating banks' trading and lending activities as well as their (re)capitalization was overdue, not least because banks that pursue a more trading-focused operation contribute more to systemic risk, as found by Brunnermeier, Dong and Palia (2012).

Additionally, the European sovereign debt crisis has imposed yet another level of burden on the affected countries' shoulders which was mainly the reason why their governments jointly decided to establish a unification of their banking systems, both in terms of regulation and supervision but also concerning an improvement in coordination and communication (the latter being markedly criticized by Schoenmaker and Véron, 2016, as being far from perfect due to, for example, a redundancy of data requests).

²² See http://europa.eu/rapid/press-release_IP-12-1048_en.htm, last retrieved: 07.08.2018.

In this respect, I want to cover a distinct selection of the most important interventions that were taken and mechanisms that were implemented to address the crisis and to build up a more stable and sound banking environment (and although there are many more implementations than the ones I will be talking about, it would go beyond the scope of this thesis to discuss all of them).²³

First off, I want to bring up a vehicle that is characterized by a hybrid position between immediate assistance to the European member states and a more medium-term (but still temporary) solution. This vehicle – with its own lending capacity of €60 billion (Tomann, 2017) – is the European Financial Stabilisation Mechanism (EFSM) which was established also in May 2010, at the same time the SMP has been set up. Via the European Financial Stability Facility it can provide financial assistance to severely troubled member states in line with the statutes of the Treaty on the Functioning of the European Union (TFEU), which effectively rules the requirements and limits for financial assistance from the EU to member states.²⁴ The EFSF can issue bonds that are guaranteed by the member states of the European Union according to the ECB's capital key, but the amount of overall assistance is maxed out at €440 billion – plus an additional €250 billion for reserve and, therefore, credit rating purposed (Zestos, 2015). Additionally, the EFSF has been upgraded with more powerful entitlements over its lifetime which provided it with more resources and measures, such as partial default insurance on said national (guaranteed) bonds, and allowed for further prudential assessment, such as recapitalization of individual banks (Bassan & Mottura, 2015).²⁵ So far, the European Commission states that Ireland and Portugal have received financial assistance from the EFSF between 2011 and 2014, whereas Greece was granted

²³ For a brief overview of EU actions between 2007 and 2017, the European Commission has provided a summarizing timeline. See <http://europa.eu/rapid/attachment/IP-17-2401/en/2007-2017%20-%20Timeline%20of%20EU%20actions.pdf>, last retrieved: 02.10.2018.

²⁴ See <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:C2010/083/01&from=EN>, last retrieved: 19.09.2018.

²⁵ See <https://www.consilium.europa.eu/media/21426/20110721-statement-by-the-heads-of-state-or-government-of-the-euro-area-and-eu-institutions-en.pdf>, last retrieved: 19.09.2018.

additional loans in 2015.²⁶ Since July 1st, 2013, the EFSF no longer provides new loans to euro area members as it is fully replaced by the European Stability Mechanism. Nevertheless, it still remains in place and is able to roll over existing loans or manage them until they mature.

Secondly, in July 21st, 2011, the governments of the euro area member states have agreed to implement the European Stability Mechanism which entered into force in July 2013, conditional on the fully implemented existence of the Single Supervisory Mechanism as the new European banking supervision (Schoenmaker & Véron, 2016). Other than the EFSF, it should serve as a permanent solution and take over most of the tasks that were originally conducted by the EFSF. It should be noted that, together with the permanence character, the ESM's financial assistance for a recapitalization of member states' banks has been criticized to act as a lender of last resort and that the future of a banking union would hinge on the very existence of the ESM (Breuss, 2015; de Costa Cabral, 2017; Kopits, 2017). The ESM has been composed with €705 billion of capital stock with a boundary of €500 billion for its initial lending volume.²⁷ As of now, it has six different financial tools to intervene with the latest two being the "indirect recapitalization" – which has been used to help Spain in 2012 with an assistance of €41 billion – and the (above already partially described) Direct Recapitalization Instrument (DRI), implemented in December 2014.²⁸ Its objective has been set up to provide liquidity to troubled banks in order to secure the stability of the financial system but also to reduce the possibility of contagion in the case of a bank that seems TBTF.

²⁶ See https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-financial-assistance/loan-programmes/european-financial-stabilisation-mechanism-efsm_en, last retrieved: 19.09.2018.

²⁷ See https://www.esm.europa.eu/sites/default/files/20150203_-_esm_treaty_-_en.pdf, last retrieved: 20.09.2018.

²⁸ See [http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/497755/IPOL-ECON_NT\(2014\)497755_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/497755/IPOL-ECON_NT(2014)497755_EN.pdf), last retrieved: 20.09.2018.

In perspective of the EFSF and the ESM, Table 3 provides a brief overview of the bailouts Greece, Ireland and Portugal received. Nevertheless, Tomann (2017) points towards the effectiveness of the ESM and its “flaws”, since it, for once, did not prevent the Greek economy from decreasing by roughly 18% between 2010 and 2015 – even with fiscal intervention on a bilateral basis and via the EFSF and ESM – but also initiated additional political uproar.

<i>Bailout</i>	<i>Greece: first bailout</i>	<i>Greece: second bailout</i>	<i>Ireland</i>	<i>Portugal</i>
<i>Amount</i>	€110 bn	€130 bn	€85 bn	€78 bn
<i>Interest</i>	5.2%	Variable	5.8%	5.7%
<i>Lenders and amounts</i>	EU countries: €80 bn IMF: €30 bn	EFSF: €102 bn IMF: €28 bn	Ireland: €17.5 bn ESM: €22.5 bn EFSF: €22.5 bn IMF: €22.5 bn	ESM: €26 bn EFSF: €26 bn IMF: €26 bn
<i>Maturity</i>	3 years	IMF: 10 years EU: varies	7.5 years Renegotiated extension (4/12/13) 7 years	7.5 years Renegotiated extension (4/12/13) 7 years
<i>Date funds available</i>	May 19, 2010	2012–14	November 28, 2010	May 16, 2011

*Table 3: EFSF/ESM/IMF Bailout actions
(source: Zestos, 2015, p. 85)*

In addition to the two ad-hoc rescue interventions for Europe, I now want to focus on the three pillars of the European banking union: The Single Supervisory Mechanism, the Single Resolution Mechanism and the European Deposit Insurance Scheme (EDIS).²⁹

Firstly, the groundwork for a banking union has been constructed by the European Banking Authority, established back in 2011. The EBA is the root source of the so-called “Single Rulebook”, a set of regulatory (agreed on) standards and uniform prudential rules to be implemented by European directives (Montanaro, 2016). Such rules then become binding laws through the affirmation of the European Commission. On this basis, the European banking supervision has been implemented via the initiation of the SSM in June 2012, its enactment in October 2013 and its complete operational level in November 2014.³⁰ Via the SSM, the ECB supervises only banks that are categorized as “significant” with respect to their market capitalization or their importance for the whole system with the main objective being a constant monitoring and, if needed, amendment of their compliance with the above mentioned set of rules (Tomann, 2017). Such an amendment could, for example, occur by inducing further capital and liquidity requirements via the Capital Requirements Directive (CRD) and the Capital Requirements Regulation (CRR), initialized in July 2013. In addition, the SSM effectively functions as a separation between the ECB’s monetary policy mandate and banking supervision, as stated by Schoenmaker and Véron (2016).³¹ The authors also stress that the ECB’s banking supervision in Europe has evolved to a point where it can be seen as mostly effective and fair, despite the diversity of the large number of institutions it has to supervise and accommodate. Yet, it sometimes creates significant frictions due to a non-optimized communication with institutions on an operational level and due to a lack of transparency when it comes to, for example, SREP scores (which are relevant for the determination of adequate capital buffers). Although they indeed

²⁹ In some literature – for example, Iglesias-Rodríguez (2016) – the banking union is characterized as consisting of only the SSM and SRM due to the fact that there is still no agreement on the implementation of the EDIS.

³⁰ See <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1024&from=en>, last retrieved: 02.10.2018.

³¹ The authors note that the separation still occurs within the same institution has previously been criticized by, for example, Goodhart and Schoenmaker (1995) and Whelan (2012).

note that banking supervision has made a big leap so far but is still a long way from being perfect, the authors especially agree on the fact that the bank-sovereign vicious cycle has not yet been abolished. Being of the same opinion, Schnabel and Véron (2018) quite recently proposed one possible solution to this, namely the accomplishment of the European Deposit Insurance Scheme (which will be addressed in a moment).

Further, in August 2014 the second pillar of the banking union, the Single Resolution Mechanism (together with the Single Resolution Fund), entered into force, just one month after the Bank Recovery and Resolution Directive.³² As with the SSM, it took a while for the SRM to be fully operational, which was finally achieved in January 2016.³³ Together with the SSM and CRD, Langfield and Pagano (2016) identify the BRRD and the SRM as crucial for a stable and sound banking landscape in Europe. In short, those four vehicles in combination seek to ensure higher capital buffers of banks on the one side and to provide a sophisticated process to resolve or restructure financial institutions in the case of failure on the other. Furthermore, the SRM – being conducted by an independent Single Resolution Board (SRB) – embodies a clearer and more professional picture concerning necessary, and historically lacking, crisis management with uniform resolution policies, contemporaneously aiming for a stable and sound financial environment by hedging systemic risk (Tomann, 2017). For comparison, the SRM represents the equivalent measure to the Orderly Liquidation Authority (OLA) linked to the Dodd-Frank Act (Guaccero, 2017).

Lastly, Europe's banking union is still lacking its third pillar, namely a mutually accepted and harmonized deposit insurance plan. Moreover, the proposed European Deposit Insurance Plan has first been suggested on June 22nd, 2015, within the frame of the Five President's Report (consisting of the presidents of the ECB, the EC, the European Parliament, the Eurogroup and the Euro Summit) but still experiences strong opposition from countries like

³² See <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0806&from=EN>, last retrieved: 02.10.2018.

³³ The Single Resolution Fund is expected to be fully operational in 2023 (Langfield & Pagano, 2016) and assumed to replace present state guarantees on an individual level (Bassan & Mottura, 2015; Vardi, 2017).

Germany (Montanaro, 2016).³⁴ In fact, there is some kind of deposit insurance existent already in form of the Deposit Guarantee Schemes (DGS) as discussed earlier in this thesis, yet only on a national level, leaving affected countries vulnerable to significant domestic shocks without a possibility of cross-border diversification (Boccuzzi & De Lisa, 2016).

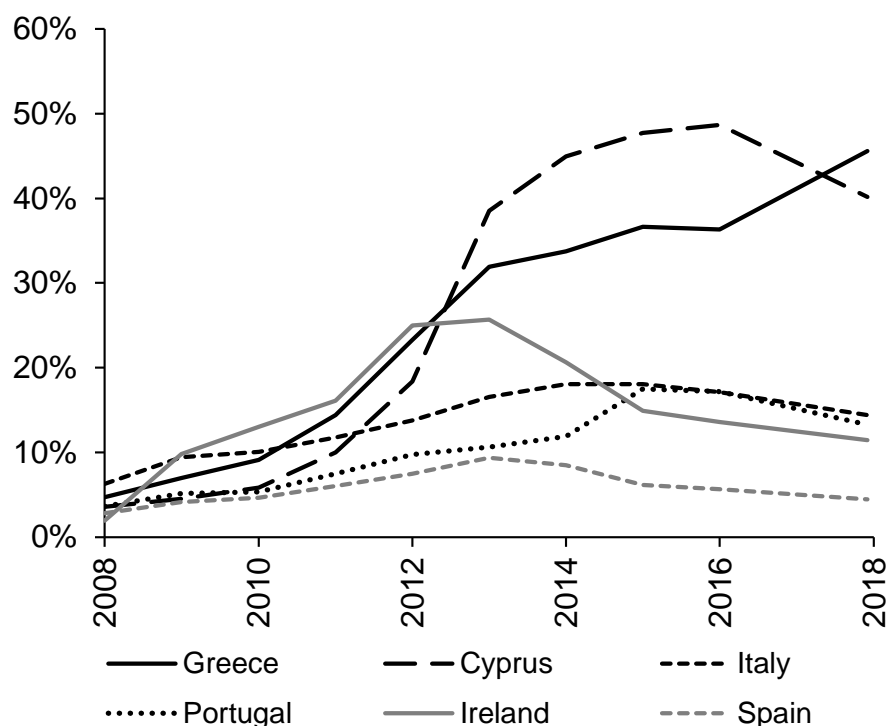


Figure 24: GIPSIC non-performing loans
(percent of total loans; source: data from IMF FSI database; last retrieved: 30.06.2018)

Concerning a possible future variant of the EDIS, Schnabel and Véron (2018) line up their suggestion with the ones previously proposed by the European Commission and by Gros (2015). Each of the reports stresses the importance of a common deposit insurance scheme, while Véron (2017) expands the thought of the EDIS implementation by also requesting more strict regulation on the reduction of European banks' sovereign exposures to break the bank-sovereign "doom loop". It will, therefore, remain as an open question whether a final agreement can be settled, especially in the light of Germany's

³⁴ See https://ec.europa.eu/commission/sites/beta-political/files/5-presidents-report_en.pdf, last retrieved: 05.09.2018.

argument not to join in unless other issues, such as Non-performing loan (NPL) ratios of the GIPSIC (which stands for the PIIGS group plus Cyprus) countries,³⁵ have been resolved (Figure 24).³⁶ This asymmetry in the size and distribution of NPLs as a still persistent issue has also been extensively addressed by Lamandini, Lusignani and Muñoz (2017), also hinting at a solution that may not be achieved on a national DGS basis.

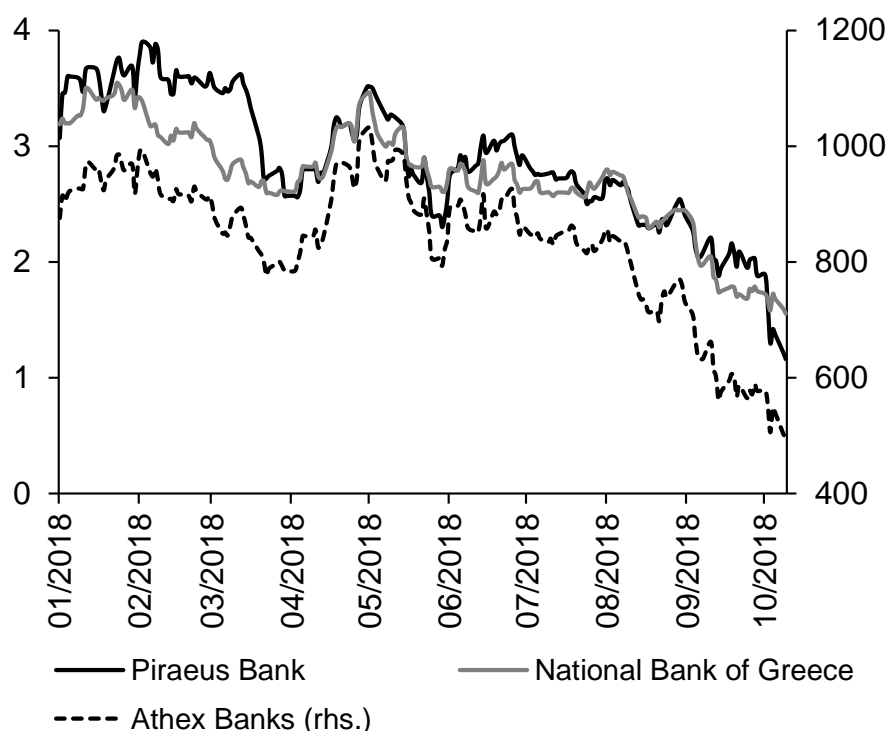


Figure 25: Daily prices of Greek bank stocks
(closing prices, €; source: data from Bloomberg L.P.; last retrieved: 09.10.2018)

In perspective of more recent relevant news – supplementing the German argument – the Greek banking sector, on aggregate represented by the FTSE Athex Bank Index, experienced a significant devaluation of almost 9% on October 3rd, 2018. After the ECB (within the SSM framework) requested an increase in bank capital, the two Greek lenders Piraeus Bank and the National Bank of Greece closed 21% and 5% lower, respectively, amid concerns

³⁵ See <http://www.eba.europa.eu/documents/10180/2385362/EBA+Dashboard+-+Q2+2018.pdf/cb4d9b7d-a154-40f1-8cb3-095a17ca012c>, last retrieved: 04.10.2018.

³⁶ See https://cepr.org/sites/default/files/policy_insights/PolicyInsight91.pdf, last retrieved: 04.10.2018.

regarding their recapitalization and reduction of non-performing loans until 2021 (Figure 25).³⁷

³⁷ See <https://www.bloomberg.com/news/articles/2018-10-03/greek-banks-said-to-promise-deep-cuts-to-pile-of-soured-debt>, last retrieved: 04.10.2018; and <https://uk.reuters.com/article/uk-greece-banks-loans/greece-working-on-bank-bad-loan-asset-protection-scheme-bankers-idUKKCN1ME1ZL>, last retrieved: 04.10.2018.

4.4. Basel and systemic risk

Although, technically, it falls under the responsibilities of the banking union's first pillar of banking supervision, I want to separately take a brief look at several characteristics and consequences of the Basel process and the approach to recapitalize financial institutions through higher equity requirements, regulate their leverage and liquidity habits to establish a more solvent and stable banking environment and to holistically reduce systemic risk and the possibility of financial contagion.

In June 2006, Basel II replaced the original Basel accord (or Basel I) and introduced a set of changes, the most important two being a set of three pillars that still make up the fundamental basis of the current implementation in form of Basel III and the renewal or improvement of internal risk models.³⁸ Its implementation under the CRD IV guideline, which – according to the EBA – was first applied as of January 1st, 2014, is expected to be completely phased in by 2019 (Ciro, 2016; Kuzucu, 2017).³⁹

Pillar-1 consists of an introduction of higher (risk-weighted) capital buffers to ensure improved resilience in case of abnormally large shocks to the system and a (risk-unweighted) leverage ratio of at least 3%, the latter being mandatory by January 2018. More specifically, common equity Tier1 (CET1) capital has been increased from 2% to 4,5% plus a capital conservation buffer of 2,5%. In addition, the minimum total amount of (Tier1 and Tier2) capital to risk-weighted assets (RWA) a bank must hold is now 8% (and 10,5% including the capital conservation buffer) and 11% for significant financial institutions (Ciro, 2016; Elson, 2017). Lastly, significant financial institutions have to accumulate an additional zero to 2,5% countercyclical capital buffer, more or less resulting from a Pillar-2 add-on (Tian, 2017). The importance of the buffer has also been stressed by Mascia, Keasey and Vallascas (2016) in light of a procyclical crisis amplification under Basel II due to extensive credit retraction.

³⁸ In the frame of this thesis, the attention is directed towards the latest Basel III approach. For an abundant additional examination of the previous two stages and relevant changes refer to Elson (2017), Goodhart (2011), Kolb (2017), Mascia, Keasey and Vallascas (2016), Tian (2017), Whalen (2008) and Zhang (2017).

³⁹ See <https://www.eba.europa.eu/regulation-and-policy/implementing-basel-iii-europe>, last retrieved: 20.09.2018.

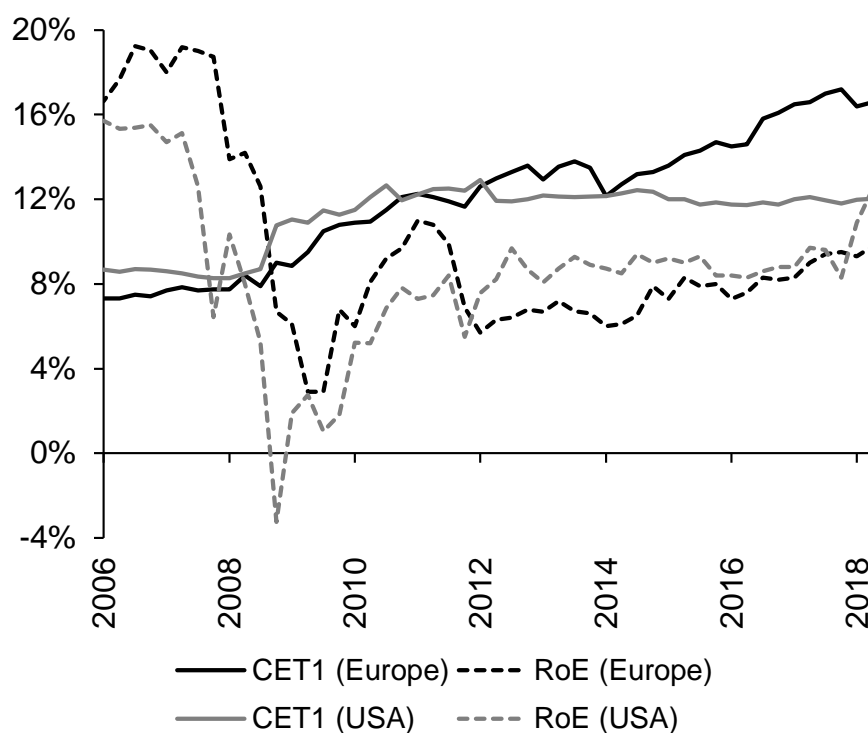


Figure 26: Banks' aggregate CET1 capital ratios & RoE
(source: data from Bloomberg L.P.; last retrieved: 01.07.2018)

By comparison, Figure 26 illustrates that (aggregate) CET1 capital ratios for European banks have roughly doubled to a level even beyond the minimum requirements since 2008 from around eight percent to 16,6% as of June 2018, which is consistent with the findings of Aikman, Haldane, Hinterschweiger and Kapadia (2018).

From the opposite perspective, banks have taken the stand in the past that acquiring new capital to restore buffers in line with regulation is extremely costly: For example, Naceur, Marton and Roulet (2018) find that CET1 capital and leverage ratios have a significant negative impact on European lending growth (which they link to the so-called “credit crunch” between 2008 and somewhat after 2015, as previously depicted in Figure 6) because raising new capital is more expensive than external funding.⁴⁰ Moreover, Cenedese, Della Corte and Wang (2017) argue that a higher leverage ratio increases the costs

⁴⁰ Despite the findings described above, they also find that capital ratios are insignificant for European banks, possibly resulting from an issue known as loan forbearance or „evergreening“. This persistent problem has also been addressed by Langfield and Pagano (2016) and Schoenmaker and Véron (2016).

for banks to engage in the market-making of derivatives, especially in the foreign exchange market. Those transactions are often characterized by low margins and high volumes which, in turn, increases the amount of total assets and, therefore, the fraction of equity required by regulation, effectively impeding financial intermediation.

Secondly, there are several arguments to be found in academic literature that analyze the existence of direct and indirect costs of raising new capital:

For once, Whalen (2008) mentions complaints that have already come up under Basel II, stating that the introduction of a mark-to-market accounting (as conveyed in the US) may have higher capital charges as a consequence. This effect may be stronger right after a crisis has occurred, presumably driving down “fair values” due to a bank’s weaker reputation, exacerbating the process of capital accumulation. Saunders (2015) supplements that due to the higher CRD IV capital and liquidity requirements, banks will abbreviate their lending activities, exhibit reduced profitability and lower return on equity (ROE) of 8% to 10% because of the structural reforms that come with Basel III (Figure 26).⁴¹ Notably, Emter, Schmitz and Tirpák (2018) see a higher ratio of non-performing loans as an additional possible “cost” as a result of higher risk weights, connecting with the argument of lower profitability above.⁴²

On the contrary, Aikman, Haldane, Hinterschweiger and Kapadia (2018) compare the assumptions made about the costs of higher capital requirements in the Basel Long-Term Economic Impact study with evidence found by Gamaçorta and Shin (2016) and conclude that most globally active banks have experienced (“virtually”) no costs of equity accumulation. Partially contributing, a paper by Gersbach, Rochet and Scheffel (2017) suggests that an indirect mitigation of said costs is endogenously embodied in the recovery process after a downturn, namely the retention of earnings or dividends or public subsidies. Implicitly, the fact that CET1 ratios have roughly doubled since the GFC may

⁴¹ Brogi and Langone (2016) wanted to show that lower required ROE linked to higher capital buffers could mean that banks are perceived as less risky by shareholders. Instead, they found the opposite, reasoning that RWA do not fully reflect banks’ riskiness for market participants.

⁴² At this point, again, it should become evident that such unsolved topics within Europe point towards an unfinished stage of a banking union, especially as the authors hint at Greece and Cyprus.

support the argument of costs to be lower than (often politically) complained, but in part the increase could also be a consequence of a reduction in RWA.

Further, an analysis conducted by Liu and Varotto (2017) shows that higher capital requirements and more strict leverage constraints may not necessarily induce a contraction in lending and, therefore, curb banks' profitability: The authors compare previous studies about larger banks which, indeed, exhibit stronger procyclicality with the behaviour of smaller banks and find that during the European sovereign debt crisis the latter ones did not reallocate their assets to switch from private sector to sovereign exposure, but rather treated them as complements. Like the countercyclical buffer introduced with Basel III, this had a smoothing effect on lending growth over the period (and vice versa for large banks). Nevertheless, they allude to the fact that higher sovereign exposure of smaller banks could also contribute to the bank-sovereign vicious cycle. Lastly, Kolb (2017) agrees on the fact that capital tightenings may not have an overly extensive effect on lending growth and that possible credit crunches resulting from newly introduced regulations may only last for a short amount of time.

Since the contributions of Pillar-2's SREP have mostly manifested within the above mentioned capital requirements (for example, in form of add-ons to the 8% of CET1 capital and a countercyclical buffer), I want to briefly discuss the other important parts of Pillar-2.⁴³ Those are, namely, the effect of internal ratings-based (IRB) models that were mainly introduced with Basel II and the latest findings about the banking landscape's exposure to systemic risk, as measured by SRISK and SYSTEM.

In contrast to the ECB, the Federal Reserve does not promote the use of internal risk models. Instead, it prefers a more uniform and simplistic approach (Schoenmaker & Véron, 2016). Nevertheless, I want to concisely touch on the findings of Gehrig and Iannino (2017) and Kolari, Lopez-Iturriaga and Sanz (2018) which analyze the evolution of systemic risk in Europe and in the US, respectively. For Europe's analysis, SRISK is used (among two other shortfall

⁴³ As previously mentioned, the SREP is subject to major critique by Schoenmaker and Véron (2016) concerning its transparency when setting the final scores for subsequent capital requirements.

measures) whereas the paper about the US uses SYSTEM – a size-weighted measure of systemic risk – as well as SRISK. The findings for the United States banking sector show that volatility increased shortly before the GFC and spiked until the end of 2008. Since SYSTEM is weighted by size, it indicates that the contribution of risk came mainly from the largest institutions. Afterwards, both SYSTEM and SRISK declined moderately, although SYSTEM resumed to pre-crisis levels whereas SRISK remained quite high between 2012 and 2016. The authors of the paper explain this observation by the fact that SRISK technically is tilted by the banks' stock prices, which severely dropped due to ongoing restructuring at the time.

Further, Gehrig and Iannino (2017) observe several interesting aspects about the implementation of proprietary IRB models: First, the decision to not use the standard model has mainly been chosen by the largest banks. Second, they found that the use of internal models even reinforced capital shortfall during the GFC with systemic risk also remaining above pre-crisis levels. Lastly, they conclude that large, systemic banks have not achieved greater resiliency, despite using their own internal models. Summarizing, this part of the Basel process only benefited the smaller banks that were relatively safe in the first place while registering an adverse effect for significant institutions.⁴⁴

Concerning Pillar 3, which covers market discipline and disclosure requirements for financial positions and a bank's risk exposure, Elson (2017) indicates that Basel II was represented by lean supervision, outdated regulatory standards and, thus, allowed for an environment in which banks published incomplete and delusive statements. Schoenmaker and Véron (2016) hinted at a necessary revision of the framework, which has finally been achieved and issued by the Basel Committee on Banking Supervision (BCBS) on February 27th, 2018.⁴⁵

⁴⁴ Those observations partially and causally connect to the findings of Liu and Varotto (2017).

⁴⁵ See <https://www.bis.org/bcbs/publ/d432.pdf>, last retrieved: 28.09.2018.

4.5. Forward guidance

In this last sub-chapter, I want to very briefly refer to a small set of papers that try to explain the importance of existing forward guidance within the frame of central bank communication.

According to Breuss (2017), the Federal Reserve was the first to implement the concept of forward guidance in 2008, while the European Central Bank followed significantly later in 2013. He notes that just the sheer information about the future path of monetary policy decisions can affect (interest rate) expectations of market participants, thereby effectively controlling long-term interest rates to some degree but also possibly causing more volatility.

The observation – or puzzle – describing higher volatility and abnormal (excess) stock market returns in expectation of the meetings where monetary policy decisions are announced is called the Federal Open Market Committee announcement drift (Lucca & Moench, 2013). Referring to the heightened volatility, it may reflect greater uncertainty for investors concerning the central bank's future outlook for growth and health of the economy, possibly creating the need for a higher risk premium. Nevertheless, a more recent examination conducted by Gilbert, Kurov and Wolfe (2018) illustrates that, for the period between 2011 and 2017, the FOMC drift has disappeared. One of their explanations conclude that, due to the previously discussed issue of a zero lower bound (Figure 21), uncertainty about future monetary policy decisions has been drastically lower, making central bank actions more predictable.

At last, Leombroni, Vedolin, Venter and Whelan (2018) have found something similarly important in their analysis of the European Central Bank's communication regarding monetary policy decisions. Precisely, they find that in the period before the GFC monetary policy actions have had a uniform impact on most European countries. After 2009, central bank communication lead to a reduction of bond yields for the “core” countries but left “peripheral” yields mostly unchanged. The authors explain the resulting spread with a risk premium that is required to compensate for a (perceived) breakup risk of the euro area.

That being said, the above mentioned examples clearly stress the importance of a sophisticated forward guidance principle that reduces market volatility spikes and avoids potential fire sales amid market participants that closely follow central banks' monetary policy decisions.

5. Conclusion

Looking back at the beginning of the great financial crisis, both the United States and the European Union have overcome various obstacles on their way to a recovered and healthy economy, with massive help of their respective central banks and monetary policy. The leap forward that has been achieved via immediate assistance to the financial sector through rescue packages and via structural and regulatory improvement, especially within Europe and its banking union, is a remarkable step in the right direction. Output growth, as well as lending capacities have picked up and banks experience higher capital buffers. Yet, there are still further steps to be taken to, for example, complete the idea of Europe's banking union and to establish a truly efficient, sound and transparent environment – something that involves even more prudent guidance and reforms (like, for example, the Markets in Financial Instruments Directive II – or MiFID II – that entered into force by January 2018). Nevertheless, asset prices (and housing prices in particular) are surging again, almost reaching the threshold of the pre-crisis peak and interest rates are rising (in the US), while debt levels are still elevated and NPL ratios have not been tamed in Greece or Cyprus. Additionally, Europe's periphery still encounters issues of high (youth) unemployment amid political turmoil that leaves investors concerned about countries like Italy and Greece, at least for the moment. It will therefore be a key requirement for both economies to closely monitor output conditions amid perceptions of a late business cycle and to induce and furbish adequate measures in order to further stabilize their systems.

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