6/6/2017

The Banking and Sovereign Feedback Loop in the Euro Area

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Economic Policy

Master Thesis

Author's Declaration:

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Date: June 6th 2017

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Table of Contents:

1.Introduction

The euro area has been in constant turmoil following the onset of the global financial crisis (GFC). Unlike the United states, the euro area suffered a subsequent debt crisis, known as the euro area crisis. The crisis exposed the flaws in the design of the euro area framework which illustrated its lacking resilience towards country-specific shocks. European policymakers were unable to maintain financial stability throughout a decade, raising questions on whether the common currency will eventually collapse. Doubts about the euro area's eligibility to share currency have been postulated early. In 1997, years before the common currency, Milton Friedman stated that "Europe exemplifies a situation unfavorable to a common currency. It is composed of separate nations, speaking different languages, with different customs, and having citizens feeling far greater loyalty and attachment to their own country than to a common market or to the idea of Europe" (Friedman, 1997). Dr. Friedman however did not experience the global financial crisis nor the euro area debt crisis but his famous quote resonated throughout the 'lost decade'. Indeed, the euro seems as an odd project. For the first time in history, a currency was created without belonging to a single nation state. The history of the euro can be separated into a pre-crisis and a crisis part. Unlike Milton Friedman, European policymakers were pleased at the time. With the introduction of the euro, interest rates dropped to German levels and real convergence in terms of GDP was taking place. Financial markets treated Greek debt like Dutch or German debt while then ECB president Jean Claude Trichet stated that in terms of price stability the newly created monetary authority outperforms its de facto predecessor Bundesbank (Atkins, 2011). Ten years later the euro area is still suffering from systemic risk in the form of a negative feedback loops between economic sectors, mainly between Banking and Sovereign. The ongoing financial instability initiated a controversial discussion regarding reforming the framework or alternatively leaving the euro area. Unfortunately, the crisis tainted European policymaker's credibility and collective support for further integration is inadequate. The following research tries to set necessary fields of reforms to break the vicious feedback loops to create a growth friendly environment.

The paper is organized as follows: Chapter 2 describes the theory and conditions of the perverse feedback loops and consequences for the real economy. Chapter 2 provides evidence on the direction and magnitude of transmission during the euro area crisis, using a sample of 7euro area countries: Austria, France, Germany, Italy, Netherlands and Portugal. Chapter 3 illustrates the original set up and its crisis experience. Chapter 4 reveals the possibilities of risk sharing via both market-based and center-based approaches before. Finally, chapter 5 sums up political implications for risk sharing mechanisms.

2. The Bank and Sovereign feedback loop

2.1. Asset side channel

The Bank- Sovereign feedback loop can be categorized into two channels, the asset side and the liability side channel. On the asset side, the rationale behind the interlinkage of domestic banks and the sovereign lies in the holding of government bonds as low-risk weighted assets. Whenever the sovereign experiences fiscal stress and creditworthiness declines, the price of government bonds falls and banks consequently endure capital losses on the asset side. The negative profits occurring can adversely affect banks' liability side, consequently leading to questions regarding their creditworthiness. On the asset side, the capital losses translate into collateral losses since government bonds are considered safe assets and enjoy preferential treatment by central banks' repo operations. Therefore, a deterioration of government bonds can cause liquidity problems for the holding banks which feeds back to non-financial enterprises due to a reduced lending capacity and banks could change their behavior towards buying government bonds in the future. The decreased demand would put further pressure on bond prices and accelerate the downward spiral. The magnitude of the feedback loops increases with higher public debt, higher exposure of the banking systems to the sovereign, and sovereign downgrades, especially the loss of investment status. The direction of the asset side channel's transmission is from sovereign to banks and it is triggered by sovereign shocks (Erce, 2015) (Angelini, Grande, & Panetta, 2014).

Government debt

Government debt in the euro area has been continuously increasing since the 1960s. The unanticipated outbreak of the global financial crisis and its bank rescue operations and fiscal stimulus measures skyrocketed public debt to hazardous levels triggering the European debt crisis. From 2007 to 2014, the average public debt ratio of member states in the euro area increased from 65% percent to 92% and stands at 89.2% at the end of 2016 (European Commission, 2017). Crisis responses such as banking recapitalizations and fiscal stimulus measures led to questions regarding the creditworthiness of euro area member states. The current public debt levels will most likely not be sufficient to transfer risk to the sovereign to prevent another economic crisis. Therefore, the alarming debt levels call for consolidation and a mechanism to further strengthen the macroprudential framework in the euro area. However, public debt levels are heterogeneous in the

euro area. In the sample countries such as Italy and Portugal debt levels reach above 130% gross government debt to GDP while Netherlands owes only 20% to its creditors (see Figure 1).

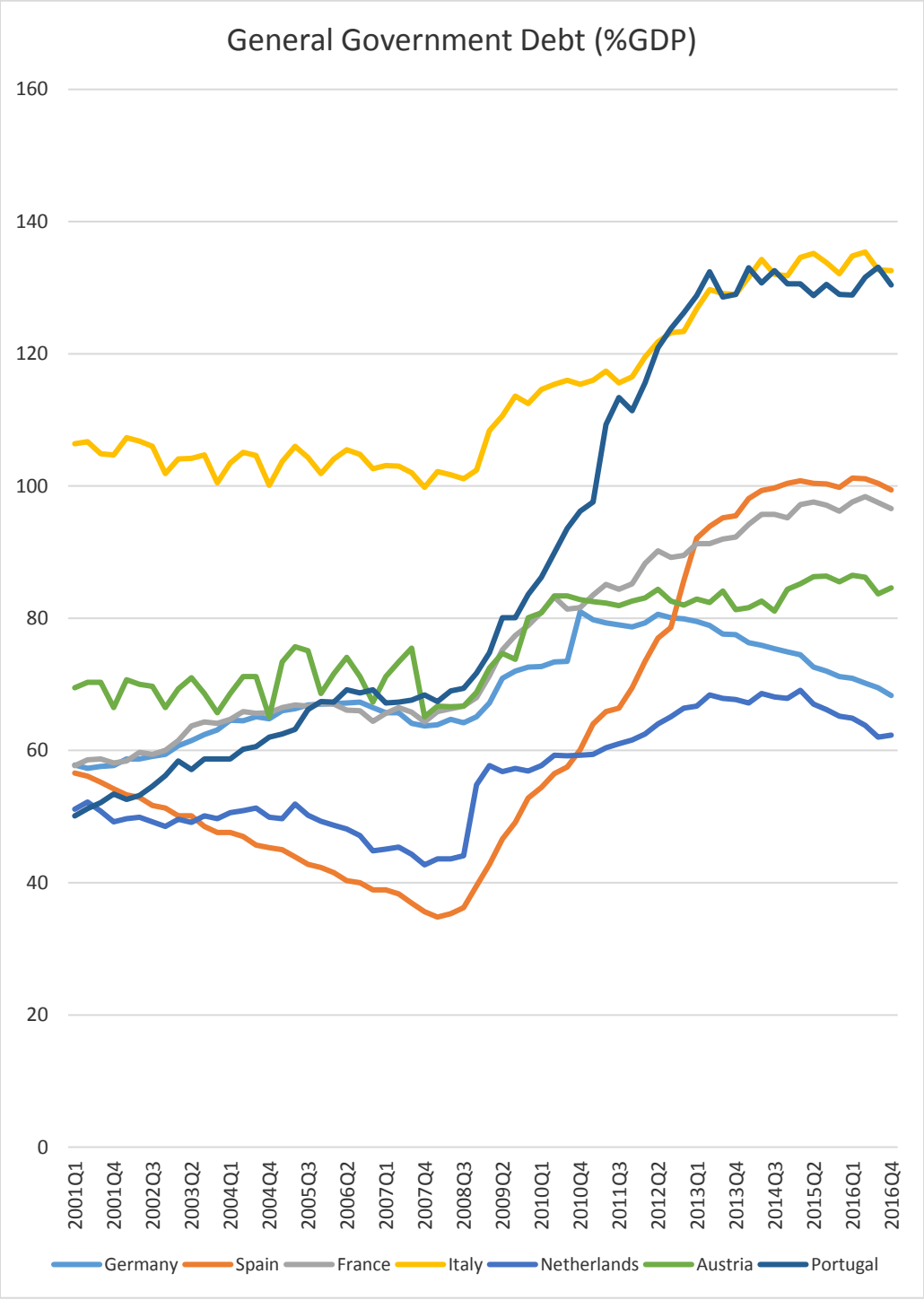


Figure 1: General government debt as a percentage of GDP, Source: Eurostat

Home bias

Another accelerating factor is the exposure of the domestic banking system to the sovereign, i.e. the amount of government debt held by domestic banks relative to total assets; this measure positively correlates to the degree of transmission of sovereign shocks to the banking industry. This phenomenon is known as the 'home bias' and interestingly reoccurred after the financial crisis, as figure 2. illustrates. This seems counterintuitive, especially since the home bias increased more in countries experiencing sovereign stress compared to financially stable countries (Battistini, Pagano, & Simonelli, 2013) investigated how domestic banks in periphery and core countries reacted to country specific shocks and deduced that banks in countries with weak sovereigns increase their exposure to the sovereign while core countries' banks do not. As discussed in the literature, home bias could be attributed to several factors:

1) Moral suasion,

2) Carry trade behavior,

3) Search for yield,

4) Divergent risk assessment between domestic and foreign banks, and

5) Creditor discrimination

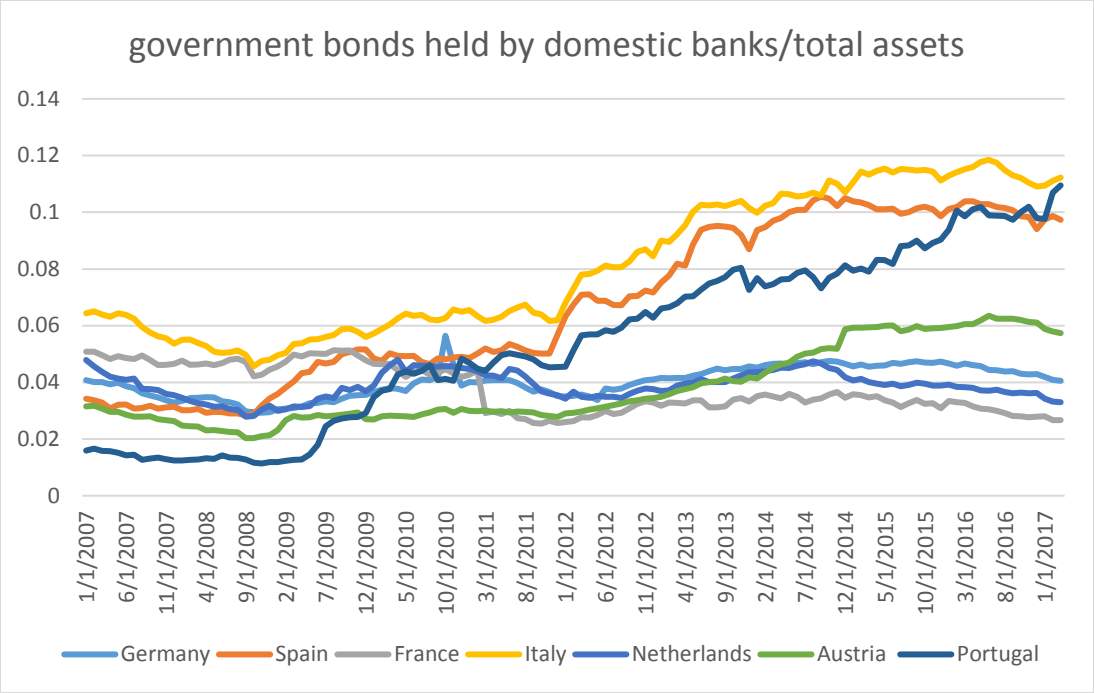


Figure 2.: exposure to the sovereign. Source: European Central Bank

Moral suasion: "moral suasion" describes the collusion between politicians of stressed countries and bank's management to maintain the demand for sovereign bonds. (De Marco & Machiavelli, 2016) analyze the situation in Germany, Spain and Italy and stress that publicly owned and bank's which management includes former politicians show more exposure to their sovereign.

Carry trade behavior and searching for yield: describes low capitalized bank's tendency to use cheap liquidity for investing in high yield bonds. However, the incentive to engage in such behavior exists for all low capitalized banks, not only domestic banks which increased their exposure.

Divergent risk assessment between foreign and domestic banks: is a factor for the home bias because domestic banks are connected to the sovereign in other direct ways (loans to the sovereign and sub governments) or indirect (the state of the domestic economy). A sovereign default therefore would lead to insolvency, regardless of the holding of government bonds and therefore rationally change the bank's risk assessment compared to banks which are only connected via

holding government bonds of another sovereign which is not their home country (Andreeva & Vlassopoulos, 2016).

Creditor discrimination: is the last factor leading to a similar behavior (home bias). Credit discriminations argues that domestic creditors would most likely enjoy preferential treatment in case of a sovereign default (Erce, 2015). Other reasons can be found in a policy related field, namely the possibility of a euro currency breaks up. This scenario was widely discussed during the peak of the European debt crisis. In this case, banks could consider hedging against redenomination and start rebalancing liabilities and assets on their balance sheets. Since deposits make a major part of liabilities, a bank would consequently buy domestic government bonds or other domestic assets. The motive to hedge against redenomination would not be internalized by foreign banks, which in turn highlights the divergence in buying government bonds. The hedging against a currency break-up can be interpreted as a defragmentation of markets within the common currency area. The decreased volume of cross-over interbank lending and the lack of integration of capital markets (which also grew less than bond markets after the introduction of the euro) suggests decreasing financial integration in the euro area, consequently strengthening the home bias (Fratzscher & Ehrmann, 2017). This is not only relevant for the financial instability which results from the sovereign and bank feedback loops, but also for smaller enterprises which do not have easy access to non-bank capital (i.e. less macroeconomic risk sharing due to a higher dependency on bank credits). (Angelini, Grande, & Panetta, 2014) (Langfield & Pagano, 2015).

The asset side channel can be considered as the chief cause for accelerating the Greece crisis. Following the former Greece government's uncovering of 'creative accounting' of past governments, creditworthiness of the Greece sovereign immediately declined. As a result, Greek banks, along with the Greek government, descended to crisis. The contagious development of this channel does not stop at national borders. French and German Banks for example also held significant parts of Greece's government debt.

2.2. Liability- side channel

The second channel between Banks and Sovereign, the liability side-channel, transmits risk from the banking sector to the sovereign when the latter decides to implicitly or explicitly guarantee

deposits or bonds of banks. The rationale behind guarantee schemes is the prevention of bank runs which could in turn cause the meltdown of the financial market. Whenever systemic instability in the banking system occurs, governments face a tradeoff between shifting the financial risk to their own balance sheet via increased public debt or leaving transmission channels to the real economy unmitigated. Unlike during the Great Depression, the latter scenario was prevented in the recent crisis by launching large scale rescue operations after the Lehman Brothers' collapse. This policy might have prevented a financial meltdown with the cost of high, often unsustainable, debt levels. As a result, the above described asset side channel gained magnitude after public debt levels skyrocketed which begs the question: do rescue packages increase or decrease financial stability? The transmission channel increases in magnitude with a lower asset quality, foreign liabilities, and size of the bank. The size of the bank is especially important as a highly asymmetric size of sovereign and banking sector (i.e. when large foreign funded banks operate in a global market), rescue operations could overburden the domestic authority and lead to immediate solvency problems, amid sound fiscal policy in general. This transmission channel transfers risk from the banking sector to the sovereign (Erce, 2015) (Reinhart & Rogoff, 2010) (Acharya, Drechsler, & Schnabl, 2014).

Bank dominance

European banks grew rapidly with the introduction of the euro and are currently in the process of deleveraging. However, the size of a country's banking industry can be relatively big compared to its GDP. This distribution might be skewed due to different property rights protection and other country-specific factors. Furthermore, in the context of fostering a single market, regulators should allow for agglomeration in order to acquire specialization gains and higher intra-industry mobility. From a macroprudential perspective, the asymmetry in the size of the banking industry, real economy, and government translates into poor risk sharing under the current framework and consequently lower shock absorption. The worst-case scenario is when explicit and implicit guarantees overburden the sovereign and almost immediately trigger sovereign default risk or the safety net (due to its size) is not perceived credible and bank runs are not prevented, amid deposit insurance and other previous bailout policies. While countries can specialize or be less diversified in other economic sectors, like Germany and its car industry, the possibility of systemic risk in

financial markets demonstrates a higher risk in clustering banking than other industries, calling for prudent supervision and regulatory policies. The real economies' dependence on bank financing might have led to moral hazardous behavior in the context of the "too big to fail" debate and an implicit status of "systemic relevant", leading to further risk taking since bank shareholders do not necessarily expect to experience losses (or alternatively cannot diversify from its sovereign anyway, as described above).

Asset quality and Non-performing loans

Besides the size of the banking industry, the quality of its assets plays a crucial role in the transmission process from banking to sovereign because it determines, first, how well a bank can absorb a capital shock within its balance sheet's asset side to maintain lending activities and second, how shareholders and deposit takers react to these shocks on the liability side. Europe is suffering from high non-performing loan ratios which stands according to the World Bank at 5.1% in the euro area compared to 1.5% in the US and Japan, respectively. The drivers of Nonperforming loans are widespread but can be separated into macro and micro determinants. From a macro perspective, higher unemployment, lower real GDP growth and lower capital account balances (as a measure of competiveness) are associated with NPL ratios, confirming standard macroeconomic theory. Unemployed individuals are unable to fulfill their loan obligations and lower expected GDP growth hampers future enterprises revenues. The divergence of economic conditions partly explains the heterogeneous picture of NPL among euro area banking industries in our sample. From a micro perspective, bank and company specific factors could also play a role. Concerning size, banks which see themselves as 'too big' to fail could engage in further risk taking, or they may see their size as a restriction for further risk-taking since it could pose difficultly to save a bank of this size. Empirical results are mixed and the behavior might be country-specific due to various resolution policies etc. Almost all studies however identify a negative relationship between return of assets and NPL since profitable banks are less incentivized in granting risky credits. Banks with high loan loss reserves, which anticipate loan default, are also connected to higher NPL ratios because these might want to smooth future revenues. Divergent policies also explain the slower recovery rate of the euro area compared to the United States where NPLs peaked in 2009 (unlike Europe 2012). The quality between supervision and banking governance may vary between countries. Second, the same holds true for legal procedures with the duration of court

settlements may cause longer holding of NPLS in balance sheets. Third, tax systems sometimes do not allow for non-performing loans such as deductibles, hampering incentives to disclose them (Anastasiou, Louri, & Tsionas, 2016) (Dimitrios & Helen, 2016). The crisis in Ireland can mostly be attributed to this transmission channel, where large shares of non-performing loans in a big banking industry, relatively small sovereign, and questionable rescue measures like blanket guarantees turned out to be a toxic mix.

As shown above, both Bank- Sovereign channels interact and the crisis witnessed a shift from liability side to asset side transmission and this is largely due to increased public debt levels and the increased home bias, e.g. increased exposure of banks to their sovereign. While rescue packages mitigated transmission to the real economy via the liability side, the increased public debt strengthens the asset side channels feedback transmission. On the other hand, a fall in government bond prices hampers the provision of implicit guarantees. The reaction of bailing out banks after the outbreak of the financial crisis can therefore, from a macroprudential perspective, be called a "pyrrhic victory" because it transformed a banking crisis into a sovereign debt crisis. In the euro area, different domestic macroprudential policies might adversely affect other countries' financial stability. The safety net of guarantee schemes in France and Germany might have been an incentive for banks to buy high risk government bonds of countries like Greece and further increase their own leverage (Kizys, Paltalidis, & Vergos , 2016) (Lane , 2012) (Acharya, Drechsler, & Schnabl, 2014). As a preliminary policy implication, the need for tackling both channels simultaneously seems inevitable and poses as a prerequisite for economic stability as whole.

2.3. Interlinkage via real economy:

Real economy and Banking: the three Squeezes

In theory, the transmission between real and financial economy can be categorized into three channels: borrower balance sheet channel, bank balance sheet channel, and liquidity channel, where the first two are the financial accelerators. As the names suggest, pressure on either lenders' or borrowers' balance sheet weakens credit supply with adverse consequences for the real economy. The liquidity channel on the other hand gained renewed attention due to the GFC when

liquidity dried up causing bankruptcy chain reactions in the banking industry. All three transmission channels contribute to the infamous credit squeeze (the dry up of credit supply) which could be broken down to collateral squeeze on the borrower's balance sheet, capital squeeze on the banks' balance sheet and the liquidity squeeze, when asset sales cause systemic risk in the banking industry.

Borrower balance sheet channel

The borrower balance sheet channel transmission can be triggered by a financial or real economy shock which hampers asset prices and borrowers' net present value. When companies rely on bank financing and these banks face difficulties with assessing the companies' health, overlook investments, or enforce repayments, the lending capacity and conditions can be negatively affected. As a response to a shock, banks could turn more prudent and reduce risks by demanding higher collaterals which increase the cost of financing leading to decreased expenditures and aggregate demand (Bernake & Blinder, 1988). (Kiyotaki & Moore , 1997) highlight the dual role of assets which either serve for production or as a collateral. When collateral requirements increase, production therefore needs to step back hampering economic activity. In turn, a downward cycle of decreased NPV, higher collaterals and lower economic activity is triggered. Due to the increased collateral demands the phenomena can be described as a collateral squeeze. The magnitude of this transmission channel is related to the degree of information asymmetry between banks and private companies (i.e. banks' ability to assess private companies' creditworthiness correctly), the initial net present value which depends highly on private debt obligation prior to the shock, and the private economies dependence on bank credit (The Bank of International Settlements , 2011). The direction of this transmission is related to the balance sheet approach from real economy to banking because a net present value shock of the borrower triggers the financial acceleration. However, in reality, net present value shocks to the real economy lead to loan defaults, e.g. hit bank's balance sheets and creditworthiness (almost) simultaneously (Jimenez, Ongena, Peydro, & Saurina, 2010). The euro area is often called a bank economy, unlike the US's market economy which possesses much higher equity finance volumes in integrated capital markets. In sum, the euro area's highly leveraged private companies rely mostly on bank financing which is, from a theoretical perspective, fueling the borrower's balance sheet channel.

Banks Balance sheet channel

Contrary to the borrowers' balance sheet channel, the banks' balance sheet channel transmission can be triggered by a shock to banks' balance sheet such as unanticipated tightening of monetary policy or capital losses. In the context of the above described asset side channel, the deterioration of government bonds can be transmitted via the banking system to the real economy due to the banks' balance sheet channel. The transmission channel can be divided into a lending channel and a capital channel with both highlighting reduced lending due to shocks to banks' balance sheets. The lending channel can be influenced by the changes in asset composition on the asset side and decreased money supply and demand on the liability side of a bank's balance sheet, which all may result as a response to monetary or financial shocks. The changing opportunity costs lead to changes in the composition of assets. Notably, the adjustment of the balance sheet itself reduces lending, independently of how banks are financed themselves (Gambacorta & Marques-Ibanez, 2011). Contrary to the lending channel approach, the capital channel takes into consideration capital losses and the bank's reactions to these. First, whenever lending is financed by capital and a capital crunch occurs, lending is consequently undermined too (i.e. both sides of the balance sheet shrink). Second, capital losses can negatively affect banks' creditworthiness. Consequently, the cost of funding might increase and banks pass the increased costs down to the borrower. Again, the borrower's expenditures decrease and aggregate demand is weakened. The magnitude of the transmission channel is negatively correlated to the borrowers' and banks' initial capitalization (The Bank of International Settlements , 2011). Besides the already mentioned indebted private companies in the euro area, banks are also highly leveraged. The direction of the transmission is from banking to the real economy. Shocks can be directly triggered by capital losses, such as decreasing values of government bonds or indirectly to aggregate demand shocks which in turn cause an increased default ratio of loans of the private sector, another type of capital loss.

The financial accelerator is made up of both the borrower's and lender's balance sheet channel. Both channels imply that net present value shocks to private companies or banks reduce the others' net present value. Consequently, lending capacity and conditions are worsened leads to the majority of weak banks' reduction in lending and preventing weak companies from obtaining credits (Jimenez, Ongena, Peydro, & Saurina, 2010). These factors lead to accelerating shocks,

giving it the name of financial accelerator. The balance sheet channels are intertwined and can be triggered from various sources like aggregate demand shock, capital shock resulting from the private economy, or sovereign. A sovereign downgrade for instance is transferred to banks holding government bonds. This triggers the banks' balance sheet channel and worsens credit conditions in the economy. This can obstruct the borrowers' balance sheet channel and trigger its transmission to the banks. Furthermore, both channels' magnitude depends on similar conditions like initial net present value of economic agents and bank dependence of the economy. The worst-case scenario for this feedback mechanism is confronting highly leveraged economic agents on both sides of the credit market, a condition which is given in the euro area, especially the peripheral member states.

Liquidity channel

The liquidity channel, refers to the selling of assets to rebalance the balance sheet as a response to shocks. The selling of assets depresses asset prices further, triggering margin calls which lead to fire sales in a downward asset price spiral. This process is widely known as bank runs. The sudden demand of payments is not matched with enough liquid assets, which leads to foreclosing loans and reducing new lending due to the asset deleveraging. The attempt to restore funding liquidity, or ability to meet obligations via asset sales reduces the market liquidity of these assets with huge excess supply. This relationship drives healthy banks to hoard liquidity in anticipation of distressed asset prices due to continued fire sales (i.e. liquid banks also reduce lending to take advantage of low asset prices in the future) (Diamond & Rajan, 2009). This logic follows the standard economic argument of deflation, e.g. investments are postponed until deflation stops, enhancing more deflationary pressures. The recent financial crisis, serves as a prime example of reinforcing market illiquidity, margin spirals on the asset side, and funding illiquidity, loss spirals on the liability side (The Bank of International Settlements , 2011). When asset prices are tanking, other institutions are affected as well. This contagious process does affect the entire banking industry, eventually leading to a collapse of the interbank market, as observed during the crisis. The need for liquidity and higher perceived counterparty risk, not only towards other banks but also non-financial institutions, reduces lending activities. In a context of underpriced risk, institutions rode the yield curve and maturity mismatches turned out to be the new normal. A high amount of maturity mismatches increases institutions' vulnerability to shocks and further strengthens the liquidity

channel. Another important aspect is the initial capital composition of banks which have been and still are highly leveraged (Kharroubi & Vidon, 2009). In short, the euro area banks have been mostly fragile when it comes to liquidity shocks and were unable to absorb these shocks with enough liquid assets or sufficient equity buffers.

The transmission from capital shocks to private enterprises and vice versa is expected to be harsh in some euro area countries due to fulfilling most conditions previous research identified as unfavorable. The real economy is on average highly indebted and high unemployment hampers demand. Banks are in the process of deleveraging but equity ratios remain low. The asset side quality is sometimes seriously reduced by high shares of non-performing loans. These factors and the condition of several sovereigns in the past 9 years, creating a feedback loop between worse real economic conditions and worst financing opportunities in volatile markets, accelerated the crisis and must be considered a cause of the low growth, low inflation era. Besides reforms in this field to prevent similar future development and maintain price and financial stability, policy makers need to tackle legacy costs like banks' asset quality and governments public finance.

3. Direction and Magnitude of Transmission

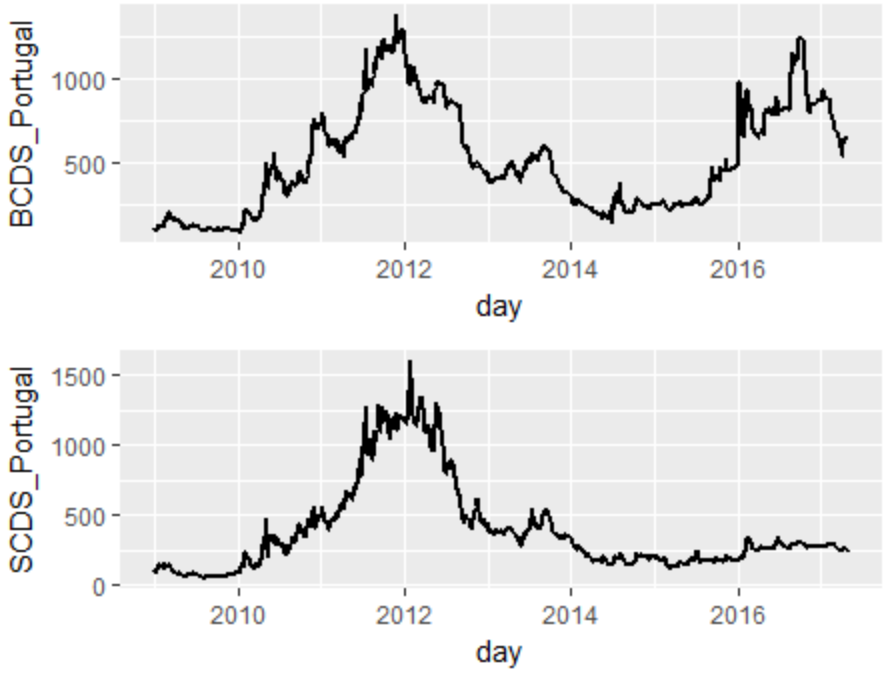
This chapter sheds evidence on the transmission of risk between sovereign and banking. With a Vector Autoregression (VAR) and an impulse response function as an estimation method, the impact of a sovereign or banking shock to the other sector is analyzed.

3.1.Data and Methodology:

The chosen empirical approach follows a strand of literature, Erce, Angelini, Archarchya, using CDS as an approximation for default risk. CDSs are contract based on an underlying bond. The buyer pays the seller an agreed series of payments during maturity. In case of a default or crossing of some other defined threshold, the seller pays the buyer's interest payments of the underlying bond and the premium, e.g. the price paid for the CDS. This allows for the usage of CDS as hedging instruments against potentially defaulting bonds. The higher the premium the higher the expected default of an entity. This allows for the usage of available Sovereign CDS (SCDS) spreads as a measure of sovereign risk. For the banking industry, a Bank risk index is created. The Bank risk index for each country is here the simple average the countries bank's CDS (BCDS), e.i.

$$Bankrisk\ i.j. = 1/j$$

The country's bank risk indices are compiled using data from 29 financial institutions, mostly banks. However, some insurance companies are included in the sample since they also hold government bonds in their portfolios and are often involved in banking activities via subsidiaries. The sample consists of 7 countries (Austria, France, Germany, Italy, Netherlands, Portugal and Spain) with 2157 daily observations from the 2nd of January 2009 to the 28th of April 2017, encompassing the entire ongoing euro debt crisis. The data is obtained from Thomas Reuters Eikon. Figure 3 illusates the comovement of BCDS and SCDS, taking Portugal as an example. For other figures see the appendix.



The feedback loop between the bank and sovereign risk hinders the application of simple linear time series regression models to determine the direction of transmission due to the implied endogeneity of feedback loops. Vector autoregressive models (VAR) combine auto regressive time series within a vector and therefore adds an explanatory factor to the model. Unlike a simple autoregressive model where the current x value is explained by value of x's lags, a VAR model explains X by its own lags *and* the current value of other variables and their lags (Stock & Watson, 2001). Here, we apply a VAR model with two endogenous variables, bank and sovereign CDS, and different lags. The two regression equations (here without a lag) are therefore:

1) $Sovereignrisk = \alpha_1 + \beta 1\, Bankrisk_{t-1} + \gamma 1\, Sovereign\ Risk_{t-1}$
2) $Bankrisk = \alpha_2 + \beta 2\, Bankrisk_{t-1} + \gamma 2\, Sovereign\ Risk_{t-1}$

All variables have been tested with a Philipps - Perron test for unit roots. The transformation is in log – differences to ensure stationarity.

2.3. Causality and hypothesis

A causal interpretation of whether higher Banking risk causes higher Sovereign Risk remains problematic. First, coefficients of VAR can only be interpreted as a causal effect when exogeneity

and no serial correlation is assumed. Second, a counterfactual outcome is naturally unobservable and impossible to predict. Third, this implies that methods known from medical research, mainly random controlled trials, are also ruled out for determining causality. However, the analysis makes it possible to determine whether one variable can be used to predict the other by applying granger causality. For example, Sovereign risk *granger causes* Bank Risk when Bank Risk can be better explained considering past Bank and Sovereign Risk instead of just Bank Risk itself, e.g. VAR predictions outperform AR predictions. Is this the case, we can state that the direction of risk transmission is *more* from bank to sovereign than vice versa. When considering the above described relationship between global financial crisis, a transmission of risk from bank to sovereign via a bank's liability side due to bailouts and recapitalization measures, and the European debt crisis, a transmission from sovereign to bank via a bank's asset side due to the holding of government bonds (and other exposures like loans), we expect a higher pass-through of risk from sovereign to banking industry. This would imply sovereign risk to granger cause banking risk.

Hypothesis 1: The pass-through from sovereign to bank is expected to be higher than the other way around.

As an estimation method, impulse response functions of VAR are used. An impulse response function tracks the effect on one variable, the response, after a one-unit innovation of the other, the impulse. Since CDS mirrors the perceived risk by financial markets and are traded in liquid markets, we expect that shocks to one sector with implications for the other one are immediately priced in both CDS spread, e.g. a sovereign shock leads to capital losses and an immediate increase of SCDS and BCDS. Since the determinants of the feedback transmission are more present in periphery countries, we assume that the magnitudes of transmission should be significantly higher than in the core countries. Table 1 summarizes the regression results:

Hypothesis 2: The magnitude of transmission is expected to be higher in Spain, Portugal and Italy than Germany, Netherlands, Austria and France.

3.2 Empirical results

Direction

The results suggest immediate or almost immediate transmission from risk since VAR applications with more than 2 lags are not significant, e.g. financial market participants react swiftly and prices are not lagging. Therefore, the analysis includes only VAR(2,1) and VAR(2,2) models. Table 1 presents the results for the core countries country and Table 2 for the periphery.

	Austria		**France**		**Germany**		**Netherlands**	
VAR(2,1)	coefficient	significance	coefficient	significance	coefficient	significance	coefficient	significance
BCDS								
SCDS-lag1	0.0991375	***	0.0690504	**	0.063716	*	0.1983078	***
BCDS-lag1	0.0477951	*	0.1733976	***	0.0744529	**	-0.1936099	***
Granger Causality								
SCDS								
BCDS-lag1	0.176581	***	0.1307	***	0.0754196	***	0.0508474	**
SCDS-lag1	0.0954751	***	0.1451	***	0.1143872	***	0.1731536	***
Granger cause: BCDS	**yes**		**yes**		**yes**		yes	
p-value	5.14E-09		7.96E-08		0.0007605		0.002805	
Granger cause:SCDS	yes		yes		yes		**yes**	
p-value	3.23E-08		0.009772		0.01066		4.61E-12	
VAR(2,2)								
BCDS								
BCDS-lag1	0.0407779		0.1770672	***	0.0741373	**	-0.2091412	***
SCDS-lag1	0.0898655	***	0.0706788	**	0.064264	*	0.2002052	***
BCDS-lag2	0.0265946		-0.0649802	*	-0.0153594		-0.0636962	**
SCDS-lag2	0.0479376	**	0.0480129		0.0131008		0.0707997	*
SCDS								
SCDS-lag1	0.0963849	***	0.1451	***	0.10969	***	0.1814614	***
BCDS-lag1	0.1721198	***	0.1353	***	0.0748491	***	0.0471639	**
SCDS-lag2	0.0445069		0.04716		0.0623203	**	-0.0192874	
BCDS-lag2	-0.0462639		-0.06	*	-0.0312108		-0.0211013	
Granger cause: BCDS	**yes**		**yes**		**yes**		yes	
p-value	3.13E-08		4.36E-08		0.00172		0.004838	
Granger cause: SCDS	yes		yes		yes		**yes**	
p-value	6.69E-08		0.003706		0.0287		2.69E-13	

Table 1: VAR results for core countries

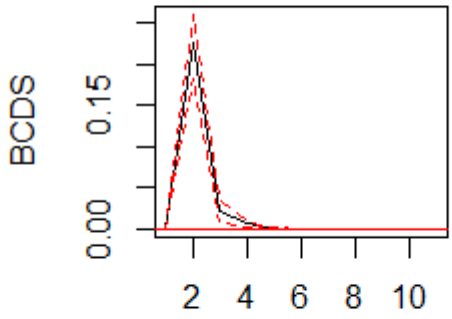
	Italy		**Spain**		**Portugal**	
VAR(2,1)	coefficient	significance	coefficient	significance	coefficient	significance
BCDS						
SCDS-lag1	0.1754355	***	0.1097	***	0.225746	***
BCDS-lag1	0.0089725		0.05059	*	-0.0857957	***
Granger Causality						
SCDS						
BCDS-lag1	0.1279	***	0.0942254	*	0.225746	
SCDS-lag1	0.03856		-0.0292114		0.1852836	***
Granger cause: BCDS	yes		yes		no	
p-value	4.70E-05		0.02764		0.7298	
Granger cause:SCDS	**yes**		**yes**		**yes**	
p-value	1.11E-14		2.13E-13		4.83E-14	
VAR(2,2)						
BCDS						
BCDS-lag1	-0.0036345		0.02793		-0.0972035	***
SCDS-lag1	0.1788395	***	0.1163	***	0.2152999	***
BCDS-lag2	-0.0097523		0.01004		0.019287	
SCDS-lag2	0.0385591		0.04198	**	0.0679244	**
SCDS						
SCDS-lag1	0.04506		-0.029998		**0.1811**	***
BCDS-lag1	0.1235	***	0.104205	*	**0.0132794**	
SCDS-lag2	-0.07596		0.0059831		**0.0393854**	
BCDS-lag2	-0.07596	*	-0.0719307		**-0.00701**	
Granger cause: BCDS	**yes**		yes		no	
p-value	2.53E-14		0.01641		0.1675	
Granger cause: SCDS	yes		**yes**		yes	
p-value	1.86E-05		2.43E-14		1.89E-14	

Concerning the direction of transmission, tests for granger causality indicate that both BCDS and SCDS are usually a good predictor for each other. However, the corresponding p- values for granger tests are usually lower for SCDS as a granger cause than for BCDS. The only country where Bank risk does not help to predict Sovereign risk, indicating a massive transmission via the asset side channel, is Portugal. The National Central Bank of Portugal identified the same phenomena for its economy (Banco de Portugal, 2016). Therefore, the transmission of risk from sovereign to bank is stronger than from bank to sovereign, implying a higher transmission via the asset side channel and possibly indirect links via the real economy. The results are in line with Erce and Angelini and supportive of Archarya et al. and Lane's rhetoric of a pyrrhic victory. Since the time series includes the entire euro debt crisis, a higher pass-through from sovereign to banking due to high public debts and the home bias seems plausible and confirms economic theory.[1]

Magnitude

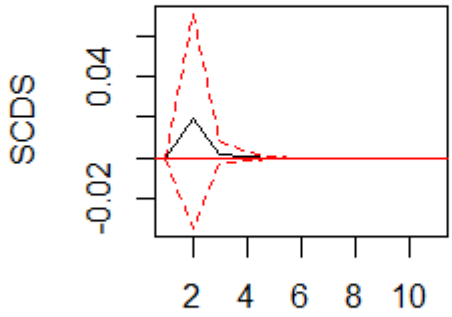
Regarding the magnitude, shock transmission is generally stronger in the stressed southern countries except for the Netherlands which seems to be an outlier. This is rather expected since southern countries fulfill the conditions identified in chapter 2 and show high public debt and a fragile banking industry. Figure 4 and 5 show impulse response function, also taking Portugal as an example. Italy and Portugal show a strong magnitude with an increase of 100bps in SCDS is associated with roughly 20bps increase in BCDS. All in all the findings support the view of a diabolic feedback loop with some countries, especially Portugal and Italy with a high degree of transmission at a high absolute level of both CDS measures. Unlike for example Germany, where the magnitude is only half as high compared to its southern partners.

Var(1),log-fd, Portugal, Impulse from Sovereign



95 % Bootstrap CI, 100 runs

Var(1),log-fd, Portugal, Impulse from Banking



95 % Bootstrap CI, 100 runs

4. Original framework and crisis experience

4.1. An Orphan currency

The euro can be described as a monetary experiment. For the first time in modern history a regional currency was created while fiscal policy remained national. The delegation of monetary policy to a supranational authority can be interpreted as a solution for the impossible trinity, stating that financial integration, monetary independence, and fixed exchange rates are incompatible (Aizenmann, 2011). In the context of fostering a single market, financial integration and eliminating exchange rate risk act as key vehicles for the project. Furthermore, the European union does not fulfill the criteria of a federation and the institutional set-up is a mix of supranationalism and intergovernmentalism, allowing for the possibility of integrated institutions with sufficient executive power, like the US Treasury. While monetary policy was integrated with the ECB, fiscal policy was based on an agreement, the Stability and Growth Pact. The rationale was that the SGP prevents hazardous debt levels while the ECB "takes care of the banks" and maintains price stability. Macroeconomic imbalances were, in a time of underpriced risk and public finance complacency, not sufficiently addressed and crisis management not part of the macroprudential set up. Instead the euro area was over-relying on a rule based on crisis prevention mechanisms mainly the SGP, the no- bail out clause and the ECB's mandate which is based on price stability and does not include monetizing of debt. As it turned out, the original set up was not effective and all parts had its flaws. The SGP for instance lacks a sanction mechanism and are not considered as a binding fiscal rule by domestic politicians. Today, Germany ironically was the first country to ignore the euro area's fiscal rules to pursue its labor market reforms. Politicians are accountable towards their domestic parliament, citizens, and subordinated supra national restrictions. Divergent policies, missing adoption to a single currency regime, mainly the instrument loss of inflating debt, and therefore different inflationary developments triggered the ECB's one size fits all problem. Besides crisis experience, academic research questioned the eligibility of some parts of Europe to be encompassed in a common currency area. Eichengreen referred to Mundell's optimal currency theory in 1991 and other authors use this framework to assess whether there should be a common European currency in the first place. The approach gained crisis induced popularity in recent times and results are partly similar and hinting towards factor mobility.

Besides lacking capital mobility, intra trade and labor mobility are also significantly lower in Europe and the euro area than in the United states. Especially labor mobility depends on cultural factors like language and one can expect that Europe will probably never reach US labor mobility rates (Eichengreen, 1991) (Fuerutter, 2012).

4.2. Banking Union, ESM, OMT: whatever it takes, an improvisation

After the EU ran various ad hoc measures as a response to the financial crisis without calming down financial markets and decreasing spreads, a turnaround was finally witnessed in the summer of 2012 when the commission announced the creation of a banking union and the European stability mechanism. In the same time the ECB announced its outright monetary transactions program underlined with a speech by Mario Draghi ("whatever it takes"). Many commentators support the view that these measures, especially OMT, changed the European bond market by reducing spread due to a higher perceived insurance from redenomination and default risk. Draghi promised, within the OMT program, that the ECB will buy government bonds of distressed sovereigns to "ensure the singleness of monetary policy" and do "whatever it takes" to save the euro, conditionally on participation in ESM adjustment programs (Draghi, 2012). Market participants interpreted this measure as the ECB taking the role of lender of last resort. In the context of the sovereign bank feedback loop, OMT highly mitigates this transmission since the worst-case scenario, a sovereign default, is practically impossible due to the demand of the ECB, if necessary. The willingness to monetize debt ended speculations on a possible currency break up. The banking union, although not entirely operational, aims to tackle the liability side channel. The rationale behind the banking union is based on the experience that, especially in a single market with a single currency and regional clustering, a banking crisis can jeopardize the sovereign when direct and indirect fiscal costs overburden it. Amid unclear funding procedures, the banking union plans to centralize supervision and resolution and provide a common backstop to reduce transferred risk from banking to the sovereign. In a sense, the announcement of a Banking Union serves as a fiscal backstop for banking operations, OMT as a lender of last resort and the ESM conditionality as an austerity- enhancing program. The latter one is intended to tackle potential

moral hazards regarding a potential slowdown of domestic reforms due to better financing opportunities. Chapter 5 discusses further steps of reforms.

In the context of the turbulent crisis period, European leaders decided to "complete the union" in an ad hoc fashion by using improvisation measures and stretching competences. In a sense OMT and the Banking Union (which can recapitalize banks via ESM) serve as firewalls. OMT promises to monetize government debt and the Banking Union promises to recapitalize Banks, if necessary. The crisis measures can in stylized fashion be interpreted as a macroprudential improvisation from an economical point of view and induced supranationalism from a political perspective (Kudrna, 2016).

5. Risk sharing in the euro area

5.1. Market based risk sharing in the euro area

Risk sharing in an economic area like the euro area can theoretically be market or center based or private and public. The aim of risk sharing mechanisms is to smooth shocks. In terms of feedback loops, this means the lowering of transmission and interdependence of the main economic sectors: private economy, sovereign and banking. This chapter assesses risk sharing in the euro area in a systematic fashion. As market-based mechanisms, the mobility of factor inputs, labor and capital are discussed and compared to the United states. As far as center-based mechanisms go, the paper mostly discusses elements like a common budget capacity, joint banking policies, and automatic transfers. A comparison to the United States is not possible since this center based institutions are widely missing in the euro area.

Labor Market integration:

Labor market integration soothes shocks by preventing unemployment due to migration to other regions. One can imagine a big output shock in Spain which causes migration to Germany. In Spain, the decreased labor supply would, in presence of a shock, mitigate the unemployment problem. In Germany the opposite effect happens, i.e. labor supply increases. Assuming full employment, this would put pressure on wages and prices. When a Spanish person residing in Germany buys both German and Spanish products with their (now German) wages, home demand increases in Germany and exports from Spain to Germany increase as well. Consequently, Spain's trade deficit and Germany's surplus are both reduced, narrowing the balance of payment. In other words: the migration of Spanish nationals to Germany facilitations the export of Spanish products to Germany which in turn soothes the output shock. This process requires perfect goods and labor markets, homogenous qualifications, and willingness, e.g. the migrant must evaluate the benefits of leaving his home country higher than staying. These ideal conditions are never given. However, the gap to labor mobility in the United states remains large, amid evidence of convergence (Beyer & Smets, 2015). The gap is to some extent justified. First, cultural and lingual differences are considerably higher in Europe than in the United States. The Spanish in our example would need to learn German and adapt to a different culture, decreasing the likelihood of a preference towards

migrating. The cultural heterogeneity in Europe can contribute to preventing labor mobility rates to reach US levels, amid high wage differentials in a geographically rather small area. Immigration is a controversial topic. Sending countries suffer a degree of brain drain due to migration, especially when it is permanent and not temporary. Receiving countries on the other hand might fear higher costs for social benefits and pressure on wages when immigration is clustered in one industry (Barslund & Busse, 2014). The European Commission is trying to facilitate labor mobility within their Europe 2020 strategy and their recently increased scope and budget for Erasmus, an initiative to motivate young people to spend a year in a different European country. Europe 2020 is a broad strategy for economic growth including labor market-related measures. One aim is to reduce administrative barriers among member states. Consequently, administrative processes should be standardized and the portability of pension rights increased. In the context of the feedback loop between banking and sovereign, a higher labor mobility reduces the impact on banks and the sovereign. Banks do not suffer from an increase of non-performing loans while the sovereign's expenditures for social benefits do not increase since unemployment is mitigated. Therefore, labor market policies which accelerate labor mobility should be considered a useful component to other financial stability measures. Sufficient support for the objective of macroprudential policy from large scaled labor market harmonization initiatives within the euro area cannot be expected. Labor market policies are most likely driven by social preferences and national governments are accountable towards their voters thus, macroprudential objectives will be most likely subordinated. The same argument holds for tax policies which also influence labor demand and supply. Labor and tax policies highly depend on the social model of the member state and affect wealth distribution. Harmonization in these field for the sake of financial stability seems unlikely.

Capital market integration:

The high funding dependence on banks for private enterprises is reflected in the asymmetric growth of bank and capital markets and their integration within the euro area. On the one hand, banks grew rapidly in the last decade and cross border lending among banks increased with the introduction of the euro. The European banking system is with an asset to GDP ratio of 334 % roughly three times bigger than the United states banking sector with 115% (Langfield & Pagano, 2015). On the other hand, capital markets remained mostly national and cross-border flows remain

relatively low. The asymmetry, making the euro zone a bank- based economy, can be simplified by answering two related questions. Why did banks grow so rapidly? And why did capital markets remain small?

Banks might have grown rapidly due to the increase in wealth. Since banks participate in wealth management activities, the banking size could depend on wealth and not GDP. However, the size of banks also grew more rapidly than wealth. Since Banks preserve wealth of mostly uninformed deposit givers, the information asymmetry between taker and giver called policy makers to regulate banks. These regulations lead to lower default ratios compared to US Banks and might have created a regulatory moral hazard. The same holds for Banks owned by governments which enjoy a strong safety net via government ownership and implicit and explicit guarantees. Their importance for real economy lending and expected help due to the voter's deposits, could create an incentive to take excessive risk and reach the size of being relevant for systemic stability. This phenomenon would also explain the high bank concentration and growth of the largest banks. Since policy makers try to prevent unpopular bank bailouts they prefer bank mergers. This accelerates the too big to fail problem and hampers competition (Langfield & Pagano, 2015). Regarding the banking and sovereign Nexus, a larger banking industry translates to a higher tradeoff between real economic contraction or fiscal risk via implicit guarantees. The banking concentration and size in euro area countries is therefore an unfavorable condition for risk transmission to the sovereign via the liability side channel. Contrary, capital markets remain underdeveloped. The European Commission initiated a capital market union (CMU) to tackle the bank bias in the euro area's financial structure. First, Capital flows face legal barriers such as different disclosure rules, different tax bases, different enforcement mechanisms for repayments and other regulatory differences. Second, different accounting rules such as the evaluation of assets jeopardize price discovery and increase informational asymmetry in favor of domestic investors, leading to a home bias in non-bank financing. Furthermore, information about ownership, business plans and financial records of smaller, usually unlisted, enterprises are not transparent and a database with common definitions is widely missing (Valiante, 2016).

The financial ecosystem described above has negative implications on financial stability. First, banks tend due to be leveraged due to their role of maturity transformation. This leads to a higher buildup of risk in boom times and harsher asset price drops in case of a shock. This has

consequences for the transmission via the liquidity channel to the real economy. Second, the absence of efficient capital markets leads to resilience on bank funding. Evidence shows that SME's without access to foreign funding suffer harsher falls in credit conditions than SME's with access to alternative funding channels. Driven by a few large banks per country and its implications for systemic risk, the absence of integrated capital markets is also a supply side problem in a classic economic sense. A capital loss to a bank in an economy with high bank dependence accelerates the transmission via the bank's capital channel, i.e. the dependence on bank financing increases the transmission to private enterprises even when large fire sale externalities are somewhat mitigated. Bank funding and market funding are not the same. Since banks reduce the information asymmetry between borrower and lender through monitoring investment and screening borrowers and security markets do not engage in these costly activities due to possibility of free riding, SME's tend to depend on bank funding. Banks can keep confidential information which are relevant for enterprises' profit confidential. However, security markets generate more venture capital and increase the risk of funding innovations (Langfield & Pagano, 2015). Therefore, a diversified financial system leads to higher risk sharing, reductions in systemic risk, enhancement of competition in fields where banks and other financial institutions are active, and thus resulting in a more efficient capital allocation to pursue economic growth.

All in all, the creation of a single capital market seems a necessary complement to a banking union and harmonization of asset definitions should be in line with the one applied for banking supervision, with especial importance for non-performing exposures. Capital market functions must be enhanced by a centralized agency collecting and presenting data in a unified fashion to reduce regulatory arbitrage and information asymmetry. Additionally, specialized courts for capital trading could use unified legal procedures to reduce uncertainty about repayments etc. Consequently, the creditor discriminatory motive for the home bias would be reduced. A balanced financial system prevents systemic risk from occurring and spreading. The creation of a capital market union, has the advantage that, amid harmonization efforts requiring legal changes and changes of accounting standards, the political obstacles seem relatively realistic to master. The agreement on definitions and rules will only lead to a trivial sacrifice of national sovereignty.

5.2. Center based risk sharing in the euro area

Common budget capacity and real exchange rate adjustment: Tackling the asset side channel

The objective of a lender of last resort role is to insure against the tail risk of a sovereign default. In a country with independent monetary policy, a central bank like the Bank of England would inflate debt away instead of accepting a sovereign insolvency. The implied lower nominal exchange rate would eventually help the real exchange rate to adjust, i.e. increase competitiveness. By entering a monetary union these monetary tools seize to exist and real exchange rate adjustment must happen via wages not prices. This is politically much costlier and trickier to conduct. As Calve (1988) pointed out, the market for government debt consists of multiple equilibria, with one equilibria stating interest rate well above GDP growth would lead governments to refuse serving their debt. According to this theory, the expectation of a default makes a default rational, therefore self-fulfilling the initial expectations, independent whether the debt is sustainable in a medium-term horizon or not. The Lender of last serves as an insurance against the tail risk of a sovereign default and cannot be achieved via monetary policy in a fixed exchange rate regime. The United States for instance have a state-wide fledged unemployment insurance scheme. From a macroprudential point of view this limits the contraction when a state is stressed and soothes the initial shock. Another advantage is that the mechanism works automatically and does not require discretionary power. In short: an automatic stabilizer was set to the federal level to smooth regional shocks. Like all insurance products, the lender of last resort mechanism is prone to moral hazard. This is particularly relevant in the euro area where horizontal solidarity is lacking. Unemployment types like seasonal, structural and frictional unemployment as well as the natural rate of unemployment are hard to observe and the risk of permanent transfers (i.e. redistribution instead of stabilization) could be an undesired moral hazard outcome. In addition to limited political feasibility, an unemployment insurance does not allow for discretionary action and therefore does not fulfill the role of lender of last resort. The only short-term solution seems to be a liquidity fund which must be accountable to European electorates, i.e. the European parliament and the national parliaments. The size and purpose of the fund must be defined and transparency from special importance to prevent trust issues. The organization could fulfill the role of the IMF within the euro area. The IMF was created to prevent sovereign defaults in a fixed exchange regime and this purpose fits to the euro area. Albeit, the sacrifice of national sovereignty when creating a "euro area IMF", the solution seems more feasible than the creation of a central euro area government and ministry of finance, an "EU Treasury", which would allow for common borrowing at the

center.[2] The creation of a liquidity fund as suggested by (Gros & Mayer, 2010) can however be a starting point for further integration steps. In order to prevent borrower moral hazard by countries, all loans from this institution must be senior to market debt and the difference between an insolvent state and partially overshooting of risk premium, e.g. liquidity problems must be evaluated by an institution freed from political interference. However, since emerging funding requires tax payers, the institution in question must be accountable towards the electorate. The bigger challenge regarding fiscal discipline is the accountability of national politicians towards the common goal of financial stability. Politicians are accountable towards their electorate who might consider subordinating certain expenditures, determined by social preferences, to an only indirectly related purpose such as the smoothing of shocks in other countries.

Banking Union and the Lender of Last resort role: Tackling the liability side channel

As a crisis reaction, the European commission announced the creation a Banking Union with the purpose to tackle the perverse feedback loop between banking and the sovereign. Since banks lend each other money across nations and regional clustering takes place, and should take place to use the potential of a single market, the logical consequence is to centralize this objective. The supervision arm of the Banking Union can be considered complete with the ECB in charge of the largest 125 Banks. The banking union should eventually consist of a single supervisory mechanism (SSM), a single resolution mechanism (SRM), a common deposit insurance, and a common backstop in case of systemic events. EU legislations paves the way for bailing out banks only with the acceptance of the Commission. The current situation is however unsatisfying from a macroprudential point of view for two reasons. First, the missing of a pan euro resolution arm does not break the feedback loop since resolution remains in charge of (mostly overburdened) sovereign. Second, the different levels of governance impede accountability. In case of a supervision failure by the ECB, national resolution authority can rightfully blame the ECB for its mistake. As Jean Pisano Ferry and Wolff (2012) state, "making national taxpayers pay for the consequences of a decision their government opposes would be a recipe for trouble". Therefore, resolution must be on the same level of governance. Similarly, to the LOLR discussion for the sovereign, insurance schemes are prone to moral hazard and therefore require a careful design. The resolution mechanism and its funding should therefore prevent banks and national regulators

from free riding and excessive risk taking. This calls for some rules to determine contribution to the resolution fund. Interestingly, the deposit insurance scheme seems as the fulfillment of the banking union and should be the final step. One might argue that the low amount of prefunding from the industry is macroprudentially irrelevant. However, a deposit insurance based on the risk of assets in the balance sheet which covers the entire euro area could be exceptionally beneficial for three reasons. First, in combination with a credible pre-funding capacity, the ex-ante effect is credible and its mere existence could reduce the likelihood of bank runs and fiscal costs. Second, when harmonized with common definition and rules on asset classes (as discussed in Chapter 4.1.), a risk-based deposit insurance acts as an incentive to disclosure balance sheet items. The mechanism design is that non-disclosed assets are associated with a high risk and a high contribution. This would change the motivation towards leaving bas assets on the balance sheet and could act as an incentive instrument to complement sanctions. Third, the reduced moral hazard by banks and a higher expected asset quality could increase the acceptance of the most controversial pillar, namely the common backstop. Consequently, the fiscal contributions would be linked to asset quality in the entire industry, size and potentially other macroprudential indicators. Therefore, moral hazard among banks and sovereigns is, in theory, mitigated. Similarly, to the lender of last resort role for the sovereign, a resolution fund as part of a central government seems unrealistic, even in the medium run. The question of funding is crucial and besides the need for a common backstop for sovereign, the creation of a very large fund for banking risk seems politically unfeasible. The solution might be a mix of funding: along with banking contributions, the ESM is planned to use as a prefunding opportunity. However, in case of systemic banking shocks in the short run, the funding would not be sufficient since the size of the ESM is limited and banking contributions need years to accumulate to a significant level. Therefore, another add on to the diversified funding could be ex ante burden sharing as suggested by the (IMF, 2013). Since costs of banking crisis are impossible to predict, the institutional quality and willingness of member state countries needs to be addressed when creating a fully operational banking union, especially the threat that diversified funding could be interpreted as not credible.

6. Political implications

The creation of a macroprudential framework with a common currency and without a state is a challenge. Mainly the possibility of moral hazard in risk sharing instruments leads to cautiousness towards integration measures. However, the paper has shown that centralization of some policy fields seems inevitable, especially crisis management mechanisms cannot be based on intergovernmental agreements due to lacking credibility, missing discretionary power and consequently a tendency for procrastination. Another complication is the need for consistency and completion of the framework. The banking and sovereign feedback loop and its adverse consequences for the real economy can only be broken by applying many measures simultaneously, i.e. an isolated fiscal backstop for sovereign would only contain systemic crisis by supporting the national governments' bank bailouts but not prevent the transmission in the first place, i.e. a common budget capacity would only take over fiscal costs but not prevent them. Without the necessary complement of banking supervision etc., this would create a similar moral hazard situation as the one we witnessed during the crisis due to the lack of credibility of the no-bail out clause of governments and omitted resolution mechanisms for banks, making bank bail-outs more likely because of the need to prevent adverse consequences for the real economy. Unfortunately, market-based risk sharing is not sufficient to tackle severe and systemic hits and a framework without any common backstop, neither for banking nor for sovereigns seems unlikely to reach the goal of creating an economic environment resilient to systemic risk. In other words, some fiscal capacity must be generated to share fiscal risks and break the feedback loop. This is in line with the common argument that a monetary union needs a fiscal union as a complement. A fiscal union requires the involvement of tax payers' money calling for political representation of the burden taker to ensure democratic accountability. In short: the rhetoric of "a monetary union needs a fiscal union and a fiscal union needs a political union", often articulated by US academics seems to be true. Although complete centralization of one European state is not necessary, and mostly not desired, some centralizations seems inevitable to "complete the monetary union". The tasks of fulfilling minimum requirements of a monetary union are already ambitious and require a carefully designed and complete framework to use the advantages of a single currency on the euro area level. On the national level, the will to integrate and share risk among countries must be present among politicians and their voters to sacrifice some national sovereignty for the prospect of being a part of a genuine single market for goods, labor, capital with one currency. Member

states are stuck in path dependence since the centralization of one pillar (the monetary union) requires another centralization. Negatively connoted, one can describe the situation as a trap since leaving the euro might be the bigger obstacle than integrating. Besides legal challenges and economic effects of a devaluation when leaving, the main problem lays in accounting. When leaving the common currency, the *entire* debt will turn into foreign liabilities. A currency depreciation of 15% would lead to an almost similar increase in real public debt, not considering second round or behavioral effects. In short: the attempt of a member state to return to their respective monetary policy and politically more feasible real exchange rate adjustment might be catastrophic.

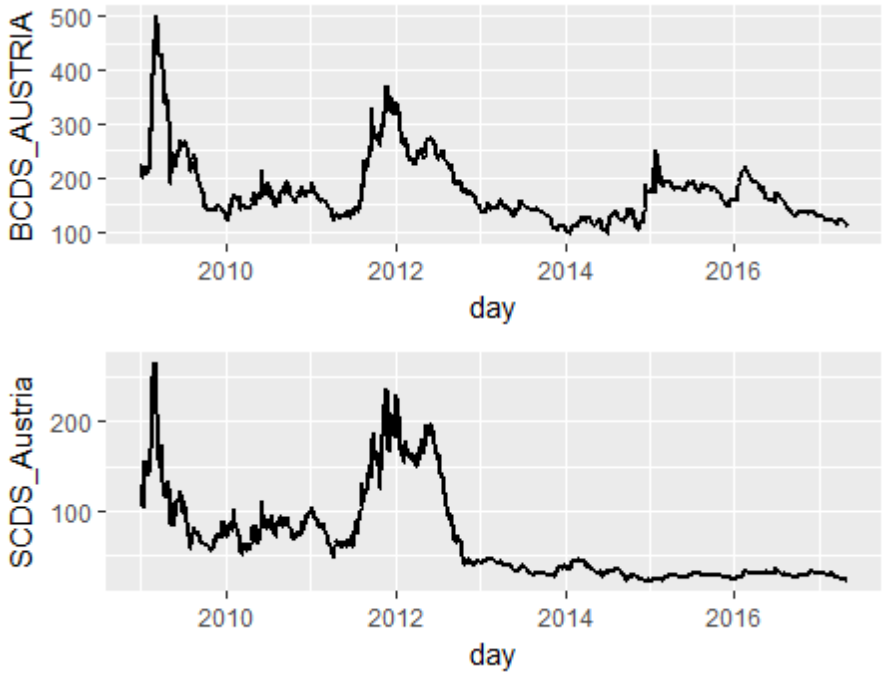
7.Conclusion:

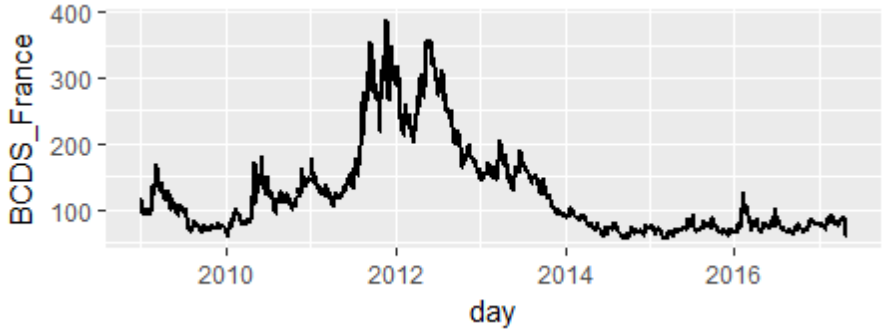
The euro area is still prone to financial instability due to the existence of perverse feedback loops within a country. The paper has shown that from a theoretical perspective, the euro area unfortunately fulfills the conditions of emerging feedback loops with high non-performing loan ratios, a debt overhang and a home bias. The presented evidence in Chapter 2 is supportive of the 'phhyric victory' statement by Archarchya, Lane and others stating a higher passthrough from sovereign to banking after risk transfers have taken place vice versa during the GFC. The crises experiences and comparison to other common currency areas like the united states, has shown several institutional shortcomings which imply a low degree of risk sharing, privately and publicly. Especially private risk sharing, as one pillar of overall risk sharing is unnecessary underdeveloped and initiatives could be enforced with relatively low political costs since harmonization efforts should not demonstrate a significant loss of national sovereignty. The public pillar of risk sharing however will most likely be a stretch for the euro area community. The macroprudential framework requires complementary reforms which must happen simultaneously to prevent the creation of moral hazard, missing accountability and a lack of democratic legitimacy. Regrettably, even the fulfillment of minimal requirements for macroprudential stability, comes with a major transfer of power to the center. The complementary nature of macroprudential reforms and its implied scale, will need policymakers to persuade voters for an idea, the European project, many might not see as convincing. Since exit costs are in most cases unbearable, the euro area created a path dependence with creating a single currency. One might conclude that an Orphan currency, e.i. money without any fiscal pillar is from a macroprudential view probably impossible to conduct. The inclusion of a fiscal pillar and tax payer's money requires political representation to preserve democratic legitimacy.

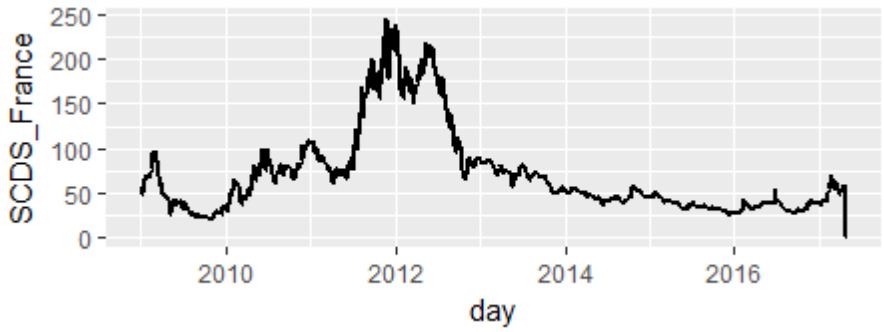
Since the status quo is not sustainable, and certainly not desirable, the future of the euro will remain a controversial issue. The future will show whether Friedman's early euro area conclusion is valid or if alternatively, the Orphan currency will get a 'caretaker' in form of other centralized institutions since a "united states of Europe" remains a hypothetical example.

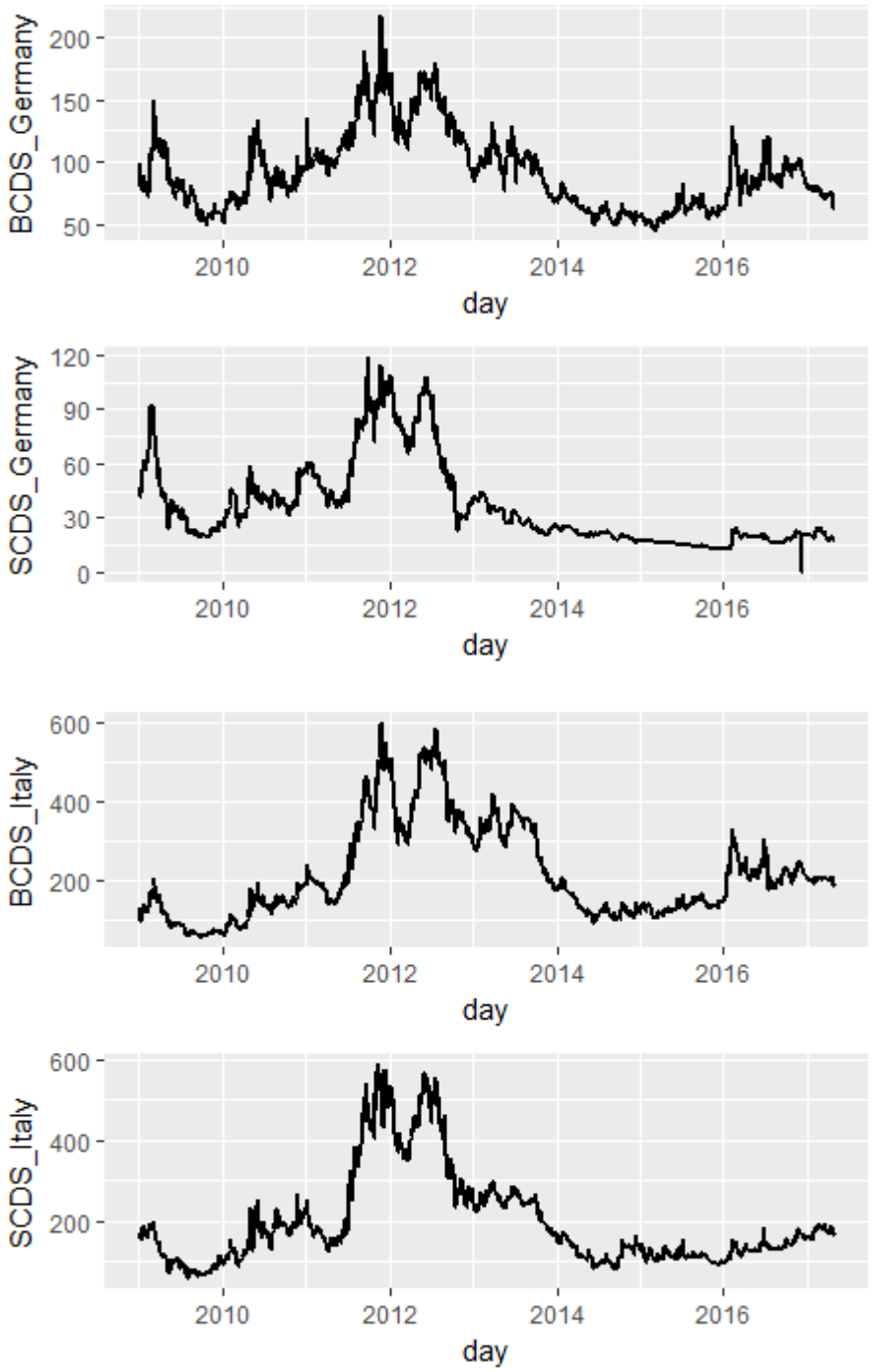
Appendix

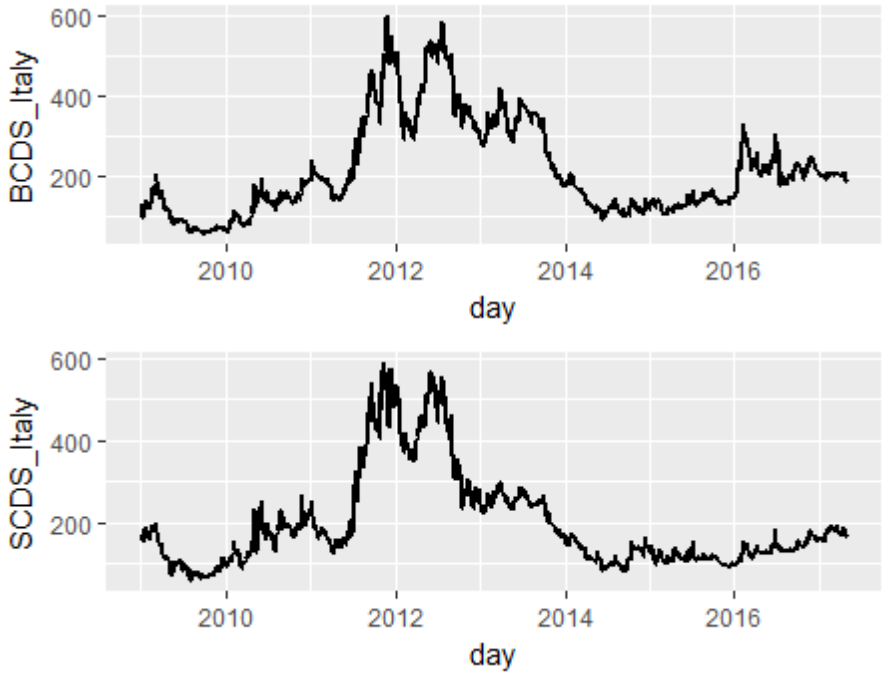
CDS Spreads: Banks and Sovereign

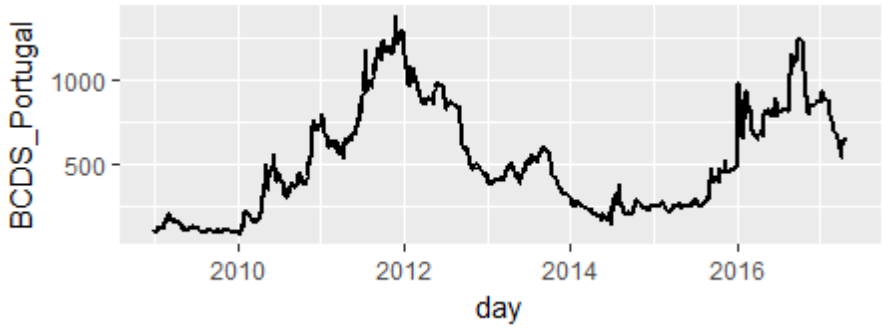


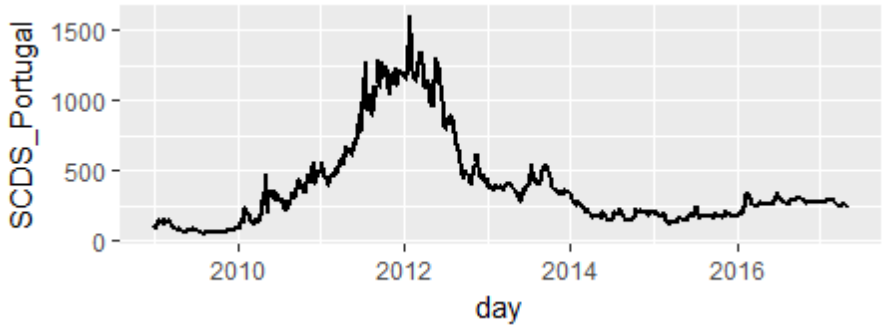


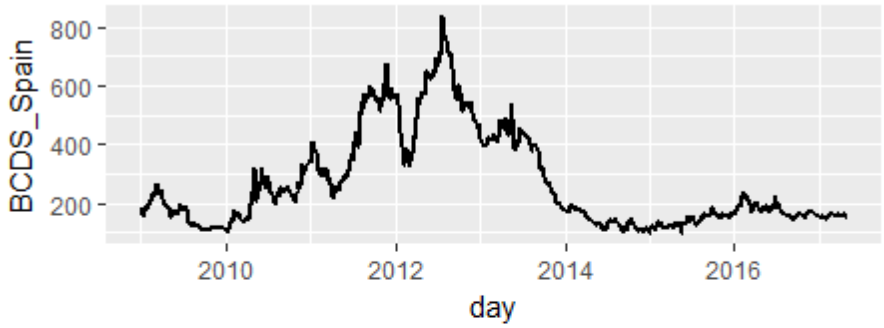


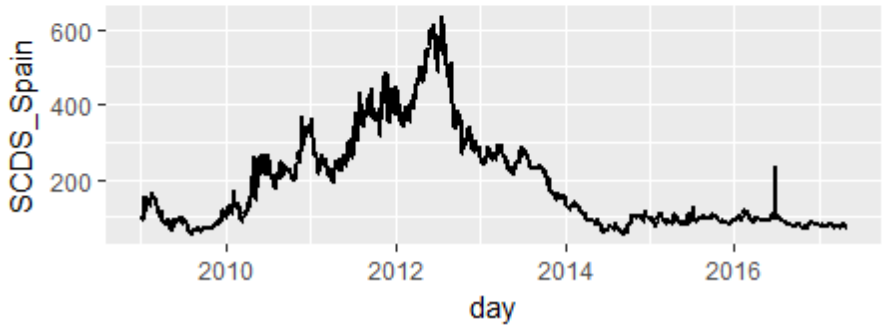




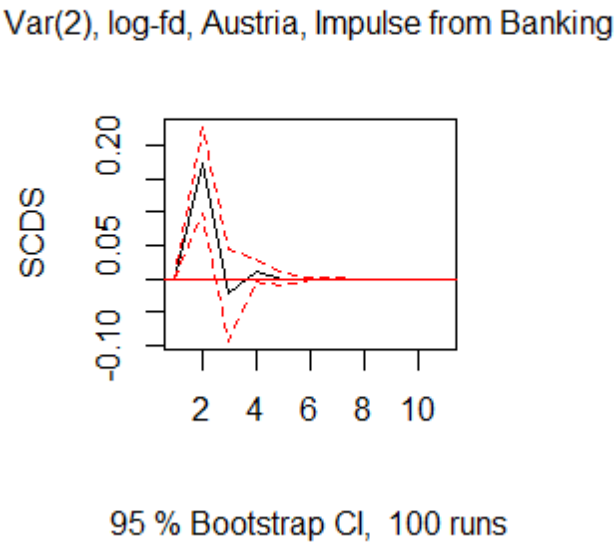


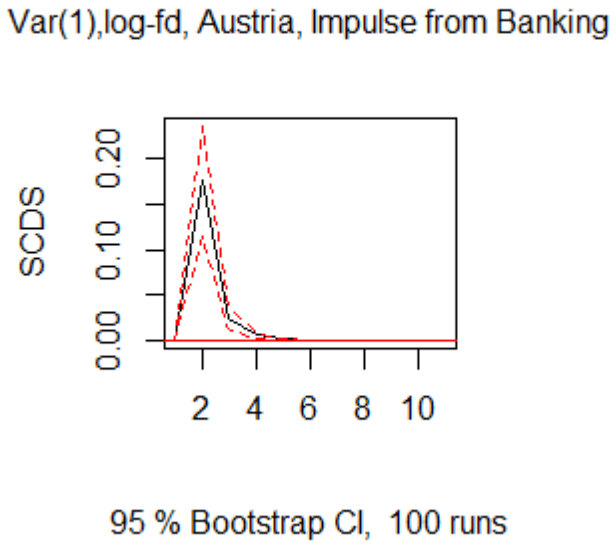




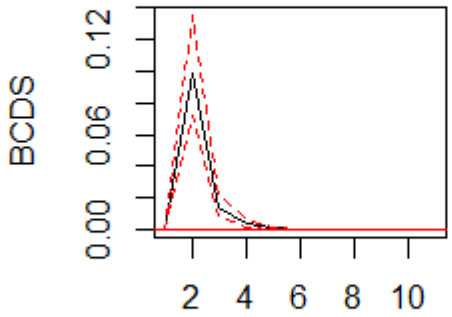


Impulse response function for VAR (2,1) and VAR(2,2)



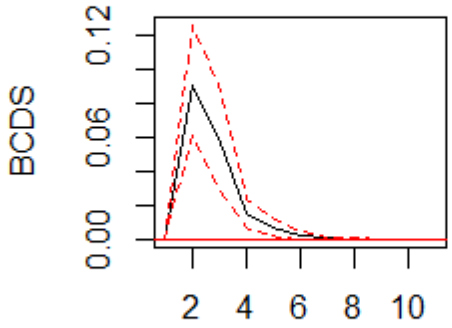


Var(1),log-fd, Austria , Impulse from Sovereign



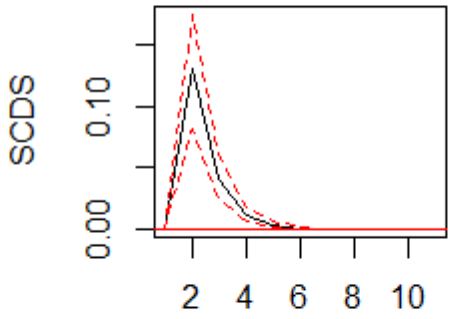
95 % Bootstrap CI, 100 runs

Var(2),log-fd, Austria, Impulse from Sovereign



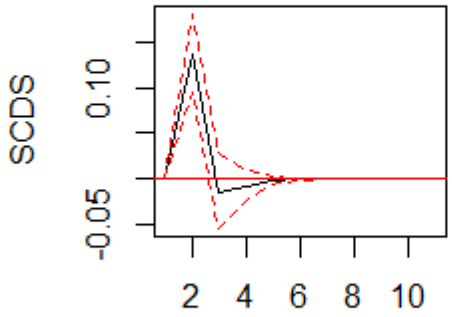
95 % Bootstrap CI, 100 runs

Var(1),log-fd, France, Impulse from Banking



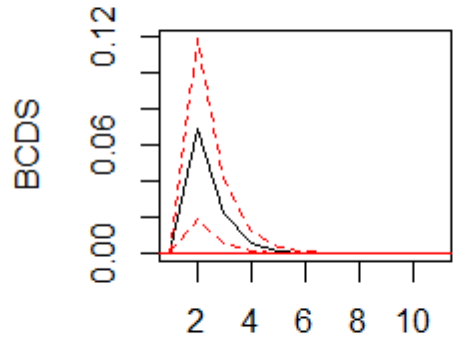
95 % Bootstrap CI, 100 runs

Var(2), log-fd, France, Impulse from Banking



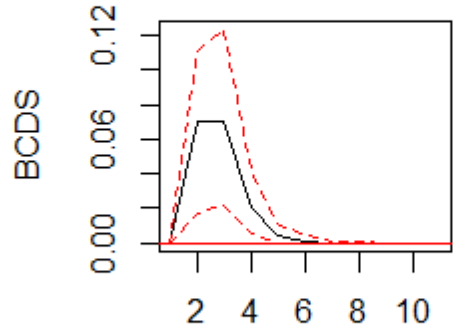
95 % Bootstrap CI, 100 runs

Var(1),log-fd, France , Impulse from Sovereign



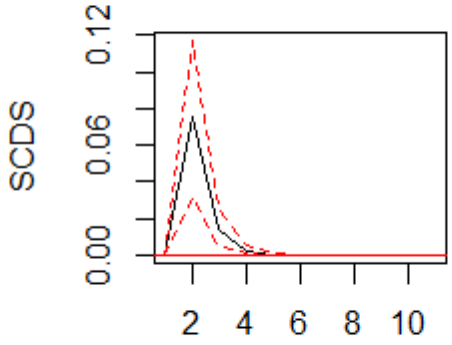
95 % Bootstrap CI, 100 runs

Var(2),log-fd, France, Impulse from Sovereign



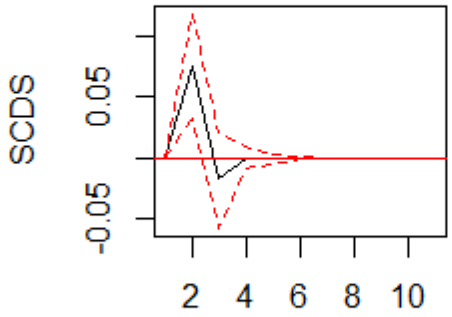
95 % Bootstrap CI, 100 runs

Var(1),log-fd, Germany, Impulse from Banking



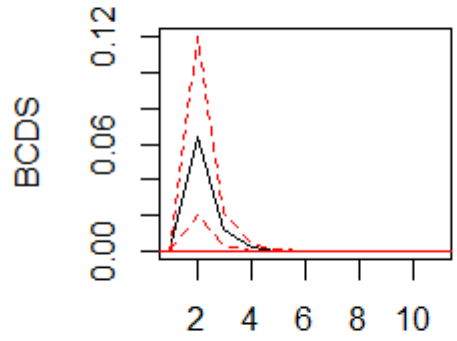
95 % Bootstrap CI, 100 runs

Var(2), log-fd, Germany, Impulse from Banking



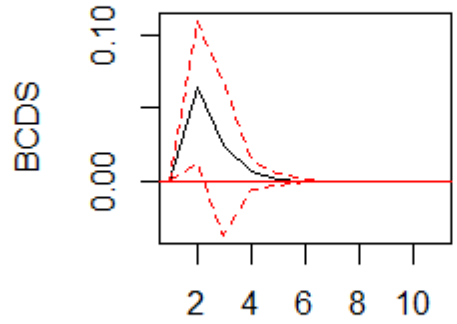
95 % Bootstrap CI, 100 runs

Var(1),log-fd, Germany , Impulse from Sovereign



95 % Bootstrap CI, 100 runs

Var(2),log-fd, Germany, Impulse from Sovereign



95 % Bootstrap CI, 100 runs

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