BAIL-IN EXPECTATIONS IN THE EU: THE IMPACT OF ITALY'S BANKING CRISIS MANAGEMENT

By

Bálint Álmos Toronyai

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Supervisor: Ádám Zawadowski

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Abstract

This thesis studies the impact of bail-in relevant events of the recent Italian banking crisis on bail-in expectations in the European Union. To analyze such relation, this thesis introduces an empirical model, using CDS spread and stock return data of European banks to mark the changes in bail-in expectations. The results of the models show that the creation of the Atlante private bail-out fund – pressured by the Italian government – and an actual private rescue of the most vulnerable Italian bank decreased most prominently the bail-in expectations in the EU. Another significant result demonstrates a negative impact on bail-in expectations of the announcement of a bail-out plan by the Italian Prime Minister, even after its rejection by the German Chancellor.

The thesis concludes that the success of the bail-in tool –as a key component of the new EU bank resolution framework - depends on the credible pledge for actually implementing it in proper conditions. In order to gain this credibility, the EU authorities should enforce the principles of the new bank recovery and resolution system, they should decline the effort of the Italian government to challenge these regulations in the current dealing of bailing out Italian bondholders. Moreover, they should clearly indicate that even if private bail-outs supported in non-financial ways by governments, they should not be considered as signs for future state bail-outs.

Acknowledgements

I would like to express my gratitude to my supervisor, Professor Ádám Zawadowski for his valuable advices for the preparation of the econometric model and his help in the CDS data collection. I am also thankful to Professor George Kopits whose lectures introduced me the dilemmas of Italy's banking crisis and the BRRD framework.

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List of Abbreviations

BRRD: Bank Recovery and Resolution Directive

GIIPS: Greece, Italy, Ireland, Portugal, Spain

G-SIBs: Globally Systematically Important Banks

SRM: Single Resolution Mechanism

SRB: Single Resolution Board

SRF: Single Resolution Fund

STRESS: The ten worst performer banks in the 2016 EU stress test

Introduction

The global financial crisis reached the European Union in a time when the EU did not have a strong centralized framework for bank recovery and resolution (Nieto, 2016). The disruption and distrust on the banking markets forced the member states of the EU to introduce bail-out programs for their most vulnerable banks in order to avoid the collapse of their banking systems. These programs put a heavy burden on the tax-payers and resulted in a sovereign debt crisis in several EU member states since 2011. The need for a new, robust resolution framework strengthened and its formulation started as a component of an EU banking union.

The EU's Bank Recovery and Resolution Directive (BRRD) entered into force in 2016, including a bail-in requirement for the resolution and recovery of failing banks. The new regulation states that public funds can be only injected to private banks in a resolution process if the shareholders and creditors absorbed losses equal to 8% of the banks' liabilities. The introduction of this new framework intended internalizing the costs of banking crises in the banking sector, and address the electorate concerns regarding the morally hazardous practice of private investors benefiting from public bail-outs.

However, the success of the bail-in rule largely depends on the market trust of its actual implementation, thus on the decrease of bail-out expectations. While there is an overall agreement in the general will to avoid bail-outs, it may conflict the objective to protect the systematic stability of the banking system (Navareti et al., 2016). In order to address the issue of systematic stability, the BRRD framework includes an escape clause for bail-in, for the cases if the injection of public funds are needed due to systematic risks and they are going to solvent institutions. This consequential exemption opens the window of possible abuses of the "no bail-out" principle of the new framework, as strong political pressure may come to trigger it with incentives beside the systematic stability of the banking system.

The most influential challenge since the introduction of the BRRD framework came from Italy. As the Italian banking crisis has started to escalate since the end of 2015, the implementation of this plan was challenged several times by the rhetoric and arguably by the actual policy measures of the Italian government. The bail-in basis of the Italian banks – in particular their junior bonds – was owned in a high proportion by the Italian middle-class. The instable nature of the Italian politics and the pressure from the rising populistic powers let the government few choices than to fight “the bureaucrats of Brussels” who would impose the bail-in losses on such important part of the electorate.

The question this thesis intends to answer whether the Italian fight against the bail-in obligation weakened the market trust in the proper application of the bail-in tool in the EU. Moreover, this thesis aims to identify the specific events of the Italian banking crisis with such impact, and formulate - from the point of view of the EU authorities – a policy approach to protect the credibility of the new framework

The structure of the paper will match the following roadmap. First, I will introduce the most important features of the new resolution framework and the literature of bail-in expectations. Then I will examine the nature of the Italian banking crisis and show the reasons how the country became the heel of Achilles of the successful implementation of the BRRD framework. Afterwards, I will introduce two empirical models using stock market returns and CDS spreads to indicate the changes in bail-in expectations. Then, I will use the results of the models to evaluate the impact of the major events on bail-in expectations, and to identify which ones can challenge the market credibility of the implementation of the BRRD. At last the thesis will form a conclusion about the policy relevance of these results.

The decision of choosing this path of my research was shaped by two major influence. First, I came to know the importance of the bail-in dilemmas in the Italian banking crisis in the course of Professor George Kopits. Second, I familiarized myself with the methodology of using stock return and CDS spread data for evaluating bail-in events in the paper of Alexander Schafer and Isabell Schnabel and Beatrice Weder di Mauro (Schafer et al., 2016). This thesis in this current form would not come into existence without these influences.

1) Bail-in tool in the European Union

The introduction of the bail-in obligation happened in the context of the broader EU policy efforts to form a more stable regulatory framework for the banking market in the EU. The need for such a reform was highlighted by the global financial crisis in 2008 and the sovereign debt crises in EMU countries from 2011. This chapter will examine the steps of the creation of the current regulatory framework and the economic and political issues which determined its development.

1.1) Demand for reform

Banking regulations in Western Europe had great shifts in the past century. The strict competition limiting regulations introduced in the 1930s and 1940s were gradually dissolved after the oil crises of the 1970s. Productive efficiency was prioritized over financial stability as the evolution of the financial market made the existing regulations out-of-date (Dewatripont, 2014). These trends determined the early financial regulations of the EU and its member states. When the global financial crisis hit the EU, the regulatory bodies of the member states were unable to complete the vital bank resolutions without the use of public sources to a large extent. There were three distinct phases of the banking crises in the European Union since the outbreak of the global financial crisis according to Codogno and Monti (Codogno and Monti, 2016).

The *first phase* was the direct impact of the collapse of confidence in the financial market after the fall of the Lehman Brothers. The defining objective of European governments in this phase was to restore the confidence in the European financial institutions by providing much needed state assistance to constrain the adverse effect of the crisis.

These costly programs put a great pressure on the public finances of the member states and accompanied with the risk avoiding behavior of the post-crisis market leads to the Eurozone's sovereign debt crises. This *second phase* of the crisis was strengthened by the feedback loop between the banking and the sovereign crisis: several European banks were exposed to government bonds, their depreciation resulted weaker financial institutions in the need for more state assistance.

The *third phase* was the impact of the broader economic crises coming along with the financial crises: the decay of the quality of loan portfolios led to an enormous stock of Non-Performing Loans, appearing in the most notified form in Italy.

The financial burden of state assistance for the banking system was extensive during these phases of the banking crises. There were three major forms applied to back up the crumbling financial institutions: guarantees, impaired asset measures and recapitalizations. More than one trillion euro guarantees were applied between 2008 and 2015, reaching 8.1 percent of the members states GDP. Impaired asset measures needed 189 billion euro in the same period, while recapitalization costed 465.6 billion euro for the states (Table 1.).

There were significant differences between the member states about the amount of state aid their banking system needed. Several member states have not had to use public funds to preserve their banking systems stability, but others, most notably Greece, Spain and Ireland had to use over 10 percent of their GDP to avoid the collapse of their banking system.

The fiscal burden of these bail out programs and their extreme unpopularity among the electors were great incentives to create new frameworks for bank resolution. This framework had to address the problem of feedback loop between failing banks and sovereign debt crises. It had to allow the conservation of the vital components of the banks and it had to introduce strong constraints to use the “taxpayer’s money” to do that. The Bank Recovery and Resolution Directive was created just to do that in the broader reform of the creation of an EU banking union.

Table 1. State aid to banks in the EU between 2008 and 2015 (EC, State Aid Scoreboard 2016)

Total amounts of used state aid, EU-28 (2008-2016)		
	EUR billion	% 2015 EU GDP
Recapitalizations	465.6	3.2
Impaired asset measures	188.6	1.3
Guarantees on liabilities	1188.1	8.1
Liquidity measures, other than guarantees on liabilities	105.0	0.7

1.2) BRRD: The new bank resolution framework

The Banking Recovery and Resolution Directive (BRRD) was adopted by the European Council and the European Parliament, establishing a new framework for bank resolutions in the European Union. It was formed in a process of fast decision making compared to the other EU reforms and in the context of the banking crises of the Eurozone. It was approved in 2014 and enacted in 2016, covering deposit taker banks and large investment banks.

This new framework of bank resolutions – lead by the Single Resolution Board (SRB) in the Eurozone - has four major objectives: "1) safeguard the continuity of essential banking operations, 2) protect depositors, client assets and public funds, 3) minimise risks to financial stability, and 4) avoid the unnecessary destruction of value." (EC Memo 2., 2014). The process of bank resolution can be triggered by the authorities exclusively on the case when private sector or supervisory interventions are not viable options, the recovery of the bank is not realistic and normal insolvency procedures would result greater uncertainty and financial instability.

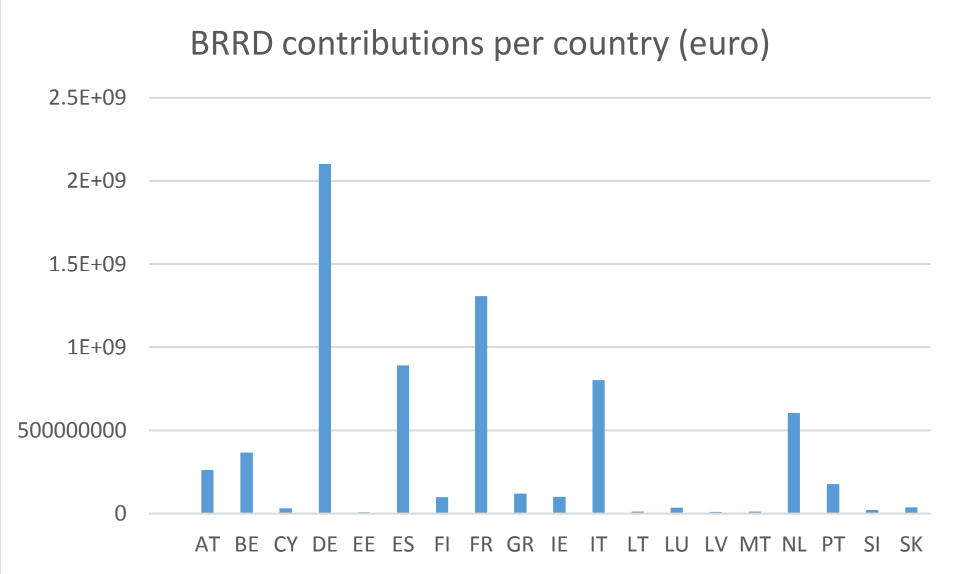
One of the key component of the reform is the introduction of the bail-in tool. The BRRD only allows state support in the resolutions after the creditors and the shareholders of the banks have been involved in burden sharing, addressing the issue of moral hazard highlighted in the cases of traditional bail-outs (Micossi, 2014). The exact way of burden sharing depends on the state of the individual banks, but the shareholders and creditors have bear losses - prior to the resolution - equal at least 8 percent of the total liabilities not backed by assets or collateral. The write down should follow the ranking of insolvency, it should start with shares and similar instruments, then subordinated debts and senior debts, finally deposits over 100 thousand euro (EC Memo, 2014).

In order to make bail-in a credible resolution tool, the banks under the authority of the BRRD have to present liabilities on which the application of the bail-in tool could be possible. Depending on the systemic risk of the financial institutions they have to maintain a certain percentage of their shares, contingent capital and unsecured liabilities on which the bail-in application is possible.

The established resolution fund for the Eurozone members – the Single Resolution Funds (SRF) - can only provide support for the bank after the bail-in and at most 5 percent of the bank's liabilities. However, if there is a systemic stress, public funds can replace partially this role of the resolution fund and even provide additional funding for bank under the resolution process (still, only after the 8 percent write-down of the bail-in procedure).

The funding of the resolution fund is happening on a national level, depending on the member states' financial sector size and the risk profiles of their banks. The target of the pooled contributions is one percent of the covered deposits. After the ten years implementation phase it will lead to approximately a fifty-five billion euro pool, what might not be sufficient, especially considering the lack of clarity about the additional funding (Navaretti et al., 2016).

Figure 1. 2016 ex-ante resolution fund contributions (Source: SRB)



The exemption for obligatory bail-in – detailed by Article 32. - is essential to have “fire-power” in order to protect the financial systems of the members states in case of a new devastating turmoil on the financial market, but it also possess the risk of trespassing the bail-in obligation and weakening the credibility of the new framework. If the regulatory bodies are not strong enough to counter the political pressure to escape the bail-in procedure, the bail-out expectations will grow and it will provide incentives for imprudent behavior in the banking markets (Hett and Schmidt, 2013). This moral hazard is exactly what the new framework intended to constraint, and what can challenge the long term stability of the banking systems in the European Union.

1.3) Bail-in and bail-out events in the literature

The literature regarding the driving factors behind bail-in expectations and the success of such resolution tools is less extensive than for the well-known bail-out procedures.

While for bail-out it is well elaborated in the literature – in particular for the US - how such events weakened sensitivity for bank risks in particular for bondholders (Hett and Schmidt, 2013), but also on a significant level for depositors (Hakenes and Schnabel, 2010). It is also recognized that increase in bail-out probability for specific banks results in higher chance of their distress (Dam and Koetter, 2013). The weakening of market discipline after the US bail-outs were recognizable in every type of banks, but it was in particular strong in the case of the large financial institutions and investment banks (Hett and Schmidt, 2013). For a global sample of banks in the pre-crisis period, there were similar observations about the increase in risk taking in the possession of stronger government guarantees (Nier and Baumann, 2006).

However, the impact of bail-in procedures is less well-known as it is a relatively new phenomenon. Most of the bail-in events happened in the European Union, starting with the second phase of the EU banking crisis.

The empirical research of these events revealed that the application of bail-in procedures increase bail-in expectations (Schafer et al, 2016), though it is not empirically researched yet if this lead to a more prudent management behavior. The effects of the bail-in events between 2011 and 2014 in the EU showed that a successfully applied bail-in resolution has got an impact not only on the bail-out expectations of the country where it had been implemented but also on the banks of other EU member states. The bail-out expectations are reduced when a bail-in event occurs, in particular in countries strongly impacted by the sovereign debt crises with high level of government debt (Schafer et al., 2016).

The conditions of the success of bail-in procedures evaluated mostly on the basis of the experiences in the EU during the three phases of banking crisis. These experiences highlight the importance of the timing: starting the resolution and applying the bail-in tool on time, when the erosion of the assets on which the bail-in tool applicable is still limited and when the access to critical functions of the banks can be still maintained (Lintner and Lincoln, 2016). These bail-in events shaped the formulation of the BRRD and helped to make the shift from bail-out to bail-in more gradual in the European Union.

Another important lesson of the EU members' bail-in history that actual bail-in events had a much greater negative impact on bail-out expectations than the establishment of a legal framework for the bail-in tool (Schafer et al., 2016). This shows the lack of trust in the European authorities that they will actually use this tool and resist the pressure of the stakeholders negatively impacted by this type of resolution. Moreover, it may also signal the fear that the new resolution framework does has major shortcoming to respond to the threat of systemic collapse (Avgouleas and Goodhart, 2014) and the no bail-out principle cannot be maintained.

My thesis intends to extend the literature of empirical researches of bail-in expectations in the EU. It will adapt the methodology used by *Schafer et al.* (Schafer et al, 2016) in their analysis of the impacts of bail-in events and regulatory changes in the EU before 2014. However, my thesis will not include regulatory changes as the new BRRD framework was already set up during the Italian banking crisis, but it will include events of the crisis management which may had an indirect influence on the regulatory development and on the credibility of the enforcement of the bail-in regulation.

2) Italy's fight against bail-in

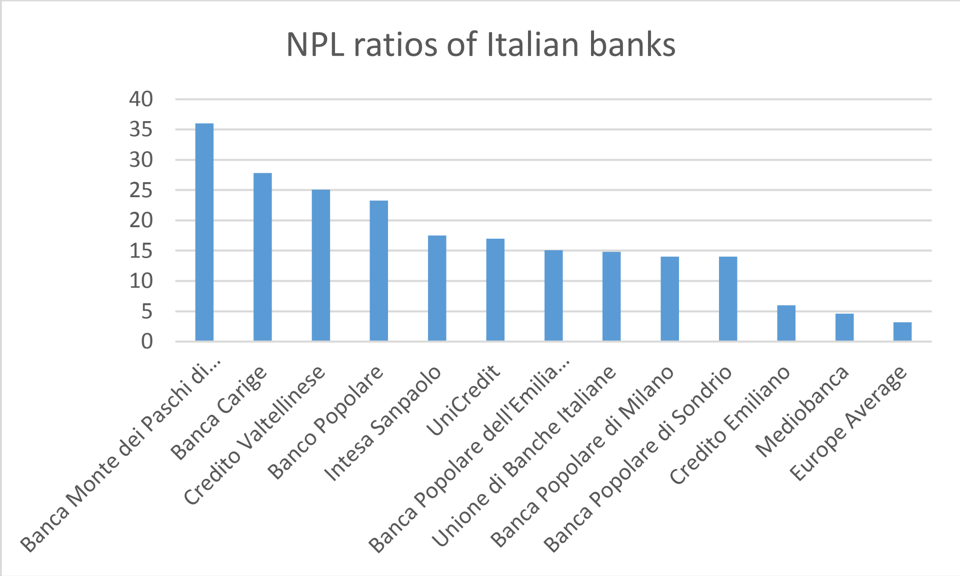
The greatest challenge regarding the credibility of the obligatory bail-in tool came from Italy during the short life of the new resolution framework. In this chapter I will examine the most important economic and political features of the Italian resistance.

2.1) The state of the Italian economy and banking system

Italy has been facing troubling macroeconomic conditions since the 1990s. The global financial crisis and then the Euro crisis hit Italy in a state of already slow growth of the economy, of virtually stagnating labor productivity, of a decline in global competitiveness and of a public debt exceeding its annual GDP (OECD Data), respectively. Though the Italian economy did not start to collapse in the years of global economic troubles, its structural imbalances worsened. While in the first years of the crisis the stability of the Italian financial system was protected, the cautionary measures of the banks, the lower risk exposure and higher capital coverage resulted in a downward pressure on the economic development. The GDP even in 2016 remained still under the 2008 level, the gradually growing public debt reached more than 130 percent of the GDP and the level of the unemployment rate stacked over 10 percent (OECD Data). These were the conditions when the *third phase* of the European banking crisis arrived in Italy, and exerted a strong damaging impact on the Italian financial stability.

The economic challenges of Italy led to the insolvency of a great amount of small and medium Italian enterprises. They were heavily indebted – mostly through mortgage backed loans - to the Italian banks. These banks stacked up approximately €360bn non-performing loans (NPLs), which is more than 18% of all banking loans and around 25% of the Italian GDP. €200bn of these NPLs is considered not collectible, reaching almost the level of the whole sectors equity (FT View, November 24, 2016). Although the Italian banks' loan loss provisions cover approximately €115bn of these losses (Baglioni, 2016), there is still enough uncovered losses to put the Italian financial system into an unstable position.

Figure 2. NPL ratios of Italian banks (Source: Bloomberg)



2.2) Political and economic constraints of bail-in

The concept of burden sharing with the investors instead of putting most of the burden on the shoulder of the taxpayers was expected to be a popular reform among European citizens. However, in Italy its application is facing a very strong opposition because of the structure of ownership of the Italian bank shares and bonds.

In the Italian banking system, the mutual and cooperative banks with a strong local identity have got a major role While they are present themselves as supporters of the local economy, they have also tended to propose for their retail customers to invest into their own shares and bonds. These retail customers were - representing large segments of the Italian middle class – considered the bonds as low risk, deposit like financial products. About third of the Italian banking bonds held by retail customers (Bowman, 2016), moreover approximately half of the junior debt of Italian banks is owned by retail customers and even higher proportion of the most concerned Italian banks (Merler, 2016). The traditionally unstable nature of the Italian politics with the pressure from surging populist movements made politically impossible not to resist against the "bureaucrats of Brussel" who want to put the burden of the banking crises on the Italian middle class[1].

Therefor the resistance against the bail-in rule was a key feature of the crisis management of the Italian government, at least on a rhetorical level. The costs of a bail-out seemed to be less troubling than facing the political consequences of a bail-in.

The biggest Italian bank on the edge of insolvency was the Monte dei Paschi di Siena (MPS), the oldest Italian bank, which alone needs 6.6 billion euros of taxpayer funds according to the Italian Central Bank (Totaro, 2016). Altogether Italian banks in similar situation with the MPS, the level of needed state funds is between 15 and 40 billion euros considering the range of conservative and less conservative estimations. Calculating with the worst case scenario estimation - 40 billion euros (Boderaeu, 2016) - the cost of short term consolidation of the Italian banking system was still only at most 2 percent of the Italian GDP.

However, until December, 2016 beyond the strong rhetoric there was no actual steps to use the escape clause of the bail-in rule and involve substantial public funds to support the failing institutions. An Italian bail-out program could weaken the credibility of the new framework and it could result third wave of government interventions. In the empirical research I will analyze whether this credibility was already impacted by the events of the Italian banking crises, in particular during by the bail-out program of last December.

[1] Although these bonds predominantly owned by the wealthiest ten percent of the Italian society (Unmack, 2016)

2.3) The timeline of the Italian bail-in events

There were six major events of Italy's banking crisis which were implemented in the context of the bail-in debate. These events will be analyzed by the empirical model of Chapter 3.

Event 1): Pre-BRRD private bail-out

Date: 22 Nov, 2015

A 3.6 billion euro private rescue fund was approved by the Italian government, arguably to do it before the new BRRD framework is enacted. In this rescue plan only shareholders and junior bondholders have to take the burden, the depositors and holders of ordinary bonds do not (Legorano, 2015).

Event 2): Establishment of Atlante

Date: April 11, 2016

The Italian government pressured the Italian banks to set up the Atlante fund in order to channel the private financial institutions money into rescuing directly endangered banks. It is a "private bail-out system", it does not contain state fund as it is not allowed by the BRRD, and the government only facilitated the cooperation between the Italian banks. It was still approximately one tenth of the estimated need of assistance and mostly the smaller banks could rely on its stabilization effect (Paolo and Parisi, 2016). This program was created to avoid the direct state support of the banking sector but exactly because of this factor it was not enough alone to overcome the NPL problem of the Italian banking sector.

Event 3) : Italian state aid plan, decline by Germany

Date: 28-29 June, 2016

Pre-event: the Italian Prime Minister introduced a plan for injecting 40 billion euro to the most struggling Italian banks (June 28). The details of the plan was not elaborated but it is expected arriving in a form of capital and pledging guarantees. The governor of Bank of Italy promised to use all tools to help the country's bondholders (Jenne et al, 2016).

Event: The German Chancellor on contrary advocated for keeping the new BRRD framework and avoid using public funds for bank bail-out (June 29).

Event 4): Private rescue of MPS

Date: 29 July

Monte dei Paschi – on the edge of insolvency – was rescued by a deal with JPMorgan. Ten billion euro worth of NPLs were written of the MPS's balance-sheet and it got five billion capital injection. Its NPL ratio decreased from 34 percent to 18 percent (Bowman, 2016).

Event 5): Resignation of PM Renzi

Date: 5 December, 2016

Prime Minister Renzi who advocated for non bail-in solutions to resolve the Italian banking crises resigns after failing of a referendum for constitutional changes (Sanderson, 2016). His resignation coming with the political instability expected to make harder forming a plan besides following the BRRD regulations and put the MPS under bail-in.

Event 6): State aid fund for MPS

Date: 21 Dec, 2016

The Italian state is rescuing the Monte dei Paschi di Siena by establishing a €20bn bail-out fund (Sanderson et al, 2016). Due to the importance of the MPS in the crisis I will introduce it in detail in the Chapter 2.4.

2.4) The bail-in of the MPS

The history of the Italian banking crisis was marked by the oldest and third biggest Italian bank, the Banco Monte dei Pasci struggle to maintain its solvency. The establishment of the Atlante fund and the private rescue plan lead by JP Morgan and the Italian Mediobanca bank was enough to recover its balance sheets still burdened by stocked up NPLs.

After the failure to organize another private bail-out in December, 2017, the Italian parliament approved a 20 billion emergency decree to support Italy's failing banking sector, from which the MPS could benefit 6.6 billion, according to the Bank of Italy's estimation (Humblot, 2017). The program was introduced under the umbrella of the escape clause of bail-in obligation interpreted it as precautionary recapitalization for a systematically important and not insolvent financial institution. The resolution of MPS was avoided, the depositors and the senior bondholders avoided taking any burden. Following the rules of the BRRD framework, losses were imposed on the shareholders and junior bondholders, including 40 000 Italian retail investors. For them, the Italian government promised to create a compensating scheme approximately in a value of 2 billion (Humblot, 2017).

The promised compensating scheme for junior bondholders made the rescue of MPS very controversial. Many argued – in particular from Germany – that the process with its bail-out like features has compromised the credibility of the enforcement of the bail-in rules (Groendahl, 2017).

3) Bail-in expectations – empirical model

The aim of this chapter is to introduce the model I used to identify the empirical relations between the bail-in related events of the Italian banking crises management and the changes in the bail-in expectations. I will follow largely the methodology of Schafer-Schnabel-Mauro (Schafer et al., 2016), building the model on the hypothesis that bail-in events result a rise in Credit Default Swap (CDS) spreads and drop in stock returns of banks if the bail-out expectations are reduced.

The model will follow the classical steps of econometric event studies: identification of relevant events and their dates, accession of data, determination the estimation method for expected values and determination of estimation and event windows, finally evaluation of the significance of the results.

3.1) Bail-in events in Italy

There were six major events of the Italian banking crises I chose to evaluate regarding their impact on bail-out expectations (Chapter 2.3). The dates I allocated them the first trading day on the stock markets following the event. By reason of my linguistic constrains, I could only include events which was published in an English language, internationally reputable newspaper.

There are substantial differences in the way and the extent how these events could have an impact on bail-in expectations. Event 6), the bail-out program for the MPS is expected to have the greatest impact as it was the only direct challenge of the European bail-in framework. The other events – political messaging, governmental transformation, private bail-out developments – had only meant indirect signals of possible policy changes. However, the responsive nature of the financial markets and their distressed attention on the Italian banking crises could still make them more relevant to define the market expectations regarding the compliance with the new framework.

3.2 Data

The model was built on using daily stock returns and senior CDS spreads of banks from the European Union. I only included banks which stocks and CDS spreads were traded continuously or with just some shorter trading break in this period. I found stock returns fulfilling those conditions for 67 banks and senior CDS spreads for 33 banks (Appendix 1.). I included its data in the model for the events took place before the bail-out program. As a market benchmark I included the STOXX 50 Index what is representing fifty major Blue-chips of the Eurozone.

The time frame of the observations covers the dates of the examined bail-out events and have a large enough period before and after the events to calculate the needed variables (which will be introduced in the next sub-chapter). The data cover approximately two years, the trading days between April 8, 2015 and March 28, 2017.

All of the data is downloaded from Yahoo Finance and Thomson Datastream.

3.3) Empirical models

The objective of my model is evaluating if differences of CDS spreads (basis points) and relative stock returns on the identified date are abnormal. In order to achieve this aim, first I determined what we can be considered normal stock returns and CDS spread and what is their difference from the actual observations. Then I used these differences – the abnormal returns – to evaluate the impact of the bail-in related events.

3.3.1) Stock Return model

In order to evaluate what we can consider abnormal returns I applied the so-called market model (Equation 1.). The market model identifies the typical relationship between relevant daily market returns and the daily returns of the examined stock. I run my model using the benchmarks of the EU stock market returns (STOXX50). I calculated for every bank the typical relation between its stock returns its market returns and what we can consider as normal returns. Then, I subtracted this value from its daily return. The results of this subtraction were the stock returns which could not be explained with the overall market trends, just with the investors' evaluation of the individual stocks. My model considers them as abnormal returns and use them to evaluate the actual impact of the examined events on the observed banks.

In order to evaluate the impact of these events, I created dummy variables for the dates on, one day prior and one day after of the relevant events. The dummy variable prior the event is needed to notify the impact of non-official leaked information and other market reaction of the final stage for the process leading to the event. The event date refers to the next trading date of the event, so some of the events became official just some hours after the closure of the particular trading day, what is considered the day prior the event. The dummy variable on the first trading day following the event should include most of the effect of the bail-in events if there is a proper flow of information regarding the effect of the event. The dummy variables for the day after the event can be useful to evaluate the market reactions when the relevance of the event is clearer for the market and it can be also useful for possible market correction.

I identified the relationship between the abnormal returns and the dummy variables of the events by running a cross-sectional, Ordinary Least Squares (OLS) regression.

Equitation 1. The Stock Return Model

The combined equation of the two phase of my model for stock returns

(The adapted model of Schafer et al. (2016) who adapted the market model of McKinlay et al, (1996))

$$R_{1t} = \alpha_i + \beta_1 R_{mt} + \sum_{n=t-1}^{t+1} \delta_{1n} D_{1nt} + \varepsilon_{1t}$$

.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \sum_{n=t-1}^{t+1} \delta_{in} D_{int} + \varepsilon_{it}$$

.

$$R_{It} = \alpha_i + \beta_I R_{mt} + \sum_{n=t-1}^{t+1} \delta_{In} D_{Int} + \varepsilon_{It}$$

Where

R_{it} denotes the bank (i) specific stock returns for every period (t), where

stock return = stock price (t) / stock price (t-1) – 1

α_i denotes the bank (i) specific intercept,

R_{Mt} denotes the market (m) return of the given (t) day, where

market return = market price (t) / market price (t-1) – 1

β_i denotes the coefficient determining the extent the specific (i) stock returns follow the market returns (R_{Mt}),

D_{int} denotes the dummy variable for the examined events (n) for the days on (t), prior (t-1) and after (t+1) the event,

δ_{jn} denotes the coefficient of the event dummy variables, determining the extent of abnormal returns on the examined days

In addition the dummies included in the equitation, I also included a singular dummy for the full observation window (t-1, t, 1+1) in order to have a tool to evaluate the overall effect of the event. Most of the regression results included in the paper are showing this overall effect, as these results are partly fixing for information leaks (t-1) and discretional market effects, corrections (t+1).

In order to evaluate the differences of the impact on different clusters of the observations (Chapter 3.4.) I included in the model an independent variable for the examined cluster and its interaction with the event (Appendix 2: Equation 3.).

3.3.2) Credit Default Swap spread model

The methodology applied for the CDS spread analysis similar (Equation 2.): I calculated the abnormal values and then their patterns in the event window. In this model however I could not use market model because of the fundamentally different features of the CDS market. Instead, I calculated the average differences in CDS values of the specific banks in an 80 days event window and I subtracted these values from the actual differences of the bank specific CDS values, following the methodology Schafer-Schnabel-Mauro (2016). I considered these values as abnormal CDS differences as they show the difference from the average changes in the bank specific CDS price of the estimation period.

I included the events in a same way as in case of the stock returns: dummy variables for the prior, on, and after the event days. In order to evaluate the impact of these events, I ran again a cross sectional, OLS regression.

Equitation 2. The combined equation of the two phase of my model for CDS spreads

(adapting the model of Schafer et al. (2016))

$$diff\ CDS_{1t} = \mu_1 + \sum_{n=t-1}^{t+1} \text{ƶ}_{1n} D_{1nt} + \varepsilon_{1t}$$

.

$$diff\ CDS_{it} = \mu_i + \sum_{n=t-1}^{t+1} \text{ƶ}_{in} D_{int} + \varepsilon_{it}$$

.

$$diff\ CDS_{It} = \mu_I + \text{ƶ}_{In} D_{Int} + \varepsilon_{It} \sum_{n=t-1}^{t+1} \text{ƶ}_{In} D_{Int} + \varepsilon_{It}$$

Where

$diff\ CDS_{it}$ denotes the changes for bank (i) specific CDS spreads between two day (t and t-1),

μ_i denotes the average difference of the bank (i) specific CDS spreads in the estimation window,

D_{int} denotes the dummy variable of the examined events (n) for the days on (t), prior (t-1) and after (t+1) the event

δ_{jn} denotes the coefficient of the event dummy variables, determining the extent of abnormal differences for the examined days

As in case of the stock return model, I included also a singular dummy covering the 3 days observation time frame. I also included cluster specific independent variable and cluster-event interaction variables for the tests comparing the different clusters of the observations (Appendix 2., Equation 3.)

3.4) Clusters of the regression

On the basis of these regression, I ran number of tests evaluate the impact of the events on the bail-out expectations, focusing different clusters of the observations.

a) Tests for Italian and non-Italian financial institutions

Although the new BRRD framework have an aim to unify the resolution process in the EU, the role of the national authorities can be still significant. If the EU fails to enforce the principles of the unified framework, the national authorities have a more important role in banks resolution. Moreover, the BRRD framework give space for national authorities for certain steps which has bail-out or bail-in like features as the past year of the Italian case shows.

b) Test for GIIPS and non GIIPS countries

In countries with problems of high sovereign debt, bail-in expectations can be increased in a greater extent with bail-in events (Schafer et al, 2016), as there is not enough fiscal space to finance a bail-out program. Italy is one of these countries, for this it can be in particular important if there is a market expectation that the others will follow Italy’s example.

c) Test for G-SIB banks and non G-SIB banks

Bail-out programs typically support systematically important banks, as their insolvency can lead for a broader crises in the banking system. For this, bail-out expectations are typically higher for them. The escape clause of BRRD for bail-in refers to conditions which typically appears in of G-SIB banks.

d) Test for worst performers in the EU stress test in 2016

The banks who proved to be the most vulnerable in the last EU wide stress test can have in particular responsive reactions to potential changes in the resolution mechanism.

e) Test for all bank

The whole sample is needed for evaluating if there is such a strong impact of the event that it has a general EU wide effect on bail-out expectations.

4) Analysis of the results of the empirical model

The empirical model provided several significant results, which can be used to form conclusions about the nature of bail-in expectations in the EU during the time of the Italian crisis. However, in the interpretation of the results it is essential to consider the very novel and complicated nature of the new bank resolution framework, and not over interpret the observed relations. Especially considering the factor that stock returns and CDS spreads give only indirect signals about those expectations.

4.1) Stock Return Model results

The stock return model showed consistent results for the different clusters of the analysis: from the six event, only Event 3) had a significant impact.

In almost every observation group there were negative abnormal returns in the three days event window of Event 3). In the whole EU wide sample on average there were 1.14 percentage point lower returns in each of the 3 days of the event window than it should have been considering the market returns. There were in particular large negative abnormal returns for G-SIB banks (Table 9.) and for the banks who had the worst performance in the 2016 EU stress test (Table 10). For the non G-Sib banks the event did not have a significant impact.

Event 3) refers to the verbal endorsement of the new resolution framework by German Chancellor Angela Merkel, declining the Italian request for making an exception for the troubled Italian banks from the bail-in clause of the BRRD (Chapter 2.3). This event suggests that the authority of the German Chancellor as a decisive voice of the future of the EU led the markets decrease their expectations for a possible bail-out.

However, if we give a look on the regression results, when there are different dummies applied for the three days, we can see that although the negative abnormal returns are consistently there, the biggest impact had the day (t-1) before Merkel's announcement (Appendix 2., Table 16.)

This was a day of an EU summit in Brussels, when the Italian prime minister announced that the bad shape of the Italian banks burdened also with the chaotic post-Brexit conditions make it necessary to introduce a state capital injection program and overcome the bail-in requirement. It is possible that the markets reacted to the doomsday rhetoric of Prime Minister Renzi, and Merkel's decision to publicly decline a possible bail-out program did not have anticipatory signals, its impact can be measured just after the announcement actually happened. To control for this scenario I run some regression including the summed up effect of only t and t+1. These regressions signaled that although with a lower scale, but including only these days there is still a significant negative impact of Event 3) on bail-out expectations (Table 15.).

Table 2. The average effect of the event (t-1, t, t+1) dummies on abnormal stock returns, for the whole bank sample from the EU (stock return model, grey: significant)

OLS, using observations 1-506 (n = 464) Missing or incomplete observations dropped: 42 Dependent variable: Abnormal stock returns Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−0.0004	0.0004	−0.8546	0.3932	
D_Event_6	−0.0021	0.0021	−1.024	0.3064	
D_Event_5	0.0071	0.0070	1.002	0.3169	
D_Event_4	−0.0009	0.0048	−0.1767	0.8599	
D_Event_3	−0.0114	0.0044	−2.586	0.0100	**
D_Event_2	0.0044	0.0052	0.8380	0.4024	
D_Event_1	−0.0008	0.0046	−0.1768	0.8598	

4.2) CDS Spread Model results

The CDS spread model should signal the trends in bail-out expectations in a more direct way than stock market returns. The result of the applied empirical model using CDS spread data shows bigger differences in the different clusters of the observations.

Event 2) and 4) had a strong negative impact on CDS spreads of Italian banks. This relation is a not surprising as both events refer either for a private bail-out (JP Morgan bails out MPS) or for the preparation for such a bail-out (creation of Atlante), decreasing the chance for a bail-in. The private bail-out showed the European banking market that even its' most struggling banks can find ways yet to avoid the application of the bail-in tool.

It is more surprising that Event 3) has an even stronger negative impact on Italian CDS spreads. The hypothesis that decreasing bail-in expectations (increasing bail-out expectations) are coming with lower CDS spreads and higher abnormal stock returns is facing a contradiction as Event 3) seems to decrease both CDS spreads and stock returns. The reason for this paradox may come from two sources.

First, the event window covers two opposing events: the introduction of a bail-out program by the Italian Prime Minister, and the dismissal of the program by the German Chancellor. Second, as I introduced the data, there is less observation for Italian bank CDS spreads than for bank stock returns. Controlling for these issues, I ran tests analyzing the impact of Event 3) for each of the three days with different dummy (Appendix, Table 17.), and I also tested again its impact on abnormal stock market returns, but now only with the same banks which are also in the CDS model. The outcome of those tests showed that the negative impact on CDS spreads in the Italian sample is very strong, even on the day of Merkel's announcement. However, the impact on abnormal stock returns including only the banks of the CDS model produced similar results as it did with the broader sample.

The results are mixed, but the change in CDS spreads is more substantial than the change in stock returns. If we accept the hypothesis that CDS is performing better or at least similarly at indicating bail-in expectations, then Event 3) had a negative impact on bail-in expectations. In other words, the market - even after the German Chancellor dismissal of the bail-out plan – was giving a higher chance of a bail-out because of Prime Minister Renzi's proposal.

In the cluster of GIIPS and for worst performer banks we can observe similar results: Event 2), 3) and 4) were significant and all of them had a negative impact on CDS spreads. For the cluster of G-SIB banks Event 2) and 4) had similar impact, Event 3) however did not have a significant impact. Considering the event's strong impact in the GIIPS cluster, it seems like the market recognize the event as a bail-in relevant one, but only for the more vulnerable member states.

Another important observation the persistent higher level of average CDS spreads of Italian banks since the starting of the banking crises. Although without the very high level of the MPS spreads the average CDS spreads of those banks remain around 150 points, it is still much higher than the approximately 100 points before the intensifying of the crises.

This growth comes together with a similar trend in the Italian CDS spreads on its sovereign debt the end of 2016, although their movement on a daily basis is not strongly correlated. Since the end of 2016 the Italian sovereign debt's CDS spreads substantially increased while there is no such trend in the Italian banking market. The market trend of higher expectations for a sovereign debt default of Italy, but no similar growth in expectations for the Italian banks indicates market expectation for bail-out like programs financed by the Italian budget, without the application of the bail-in tool on creditors.

Figure 3. Average CDS of Italian banks (Source: Thomson Datastream)

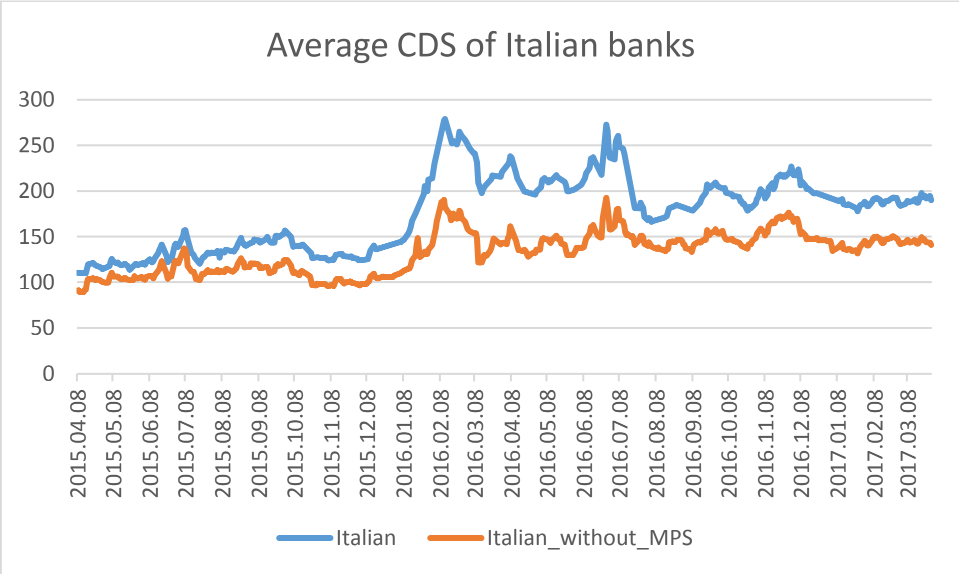


Figure 4. Italian CDS spreads (Source: Thomson Datastream)

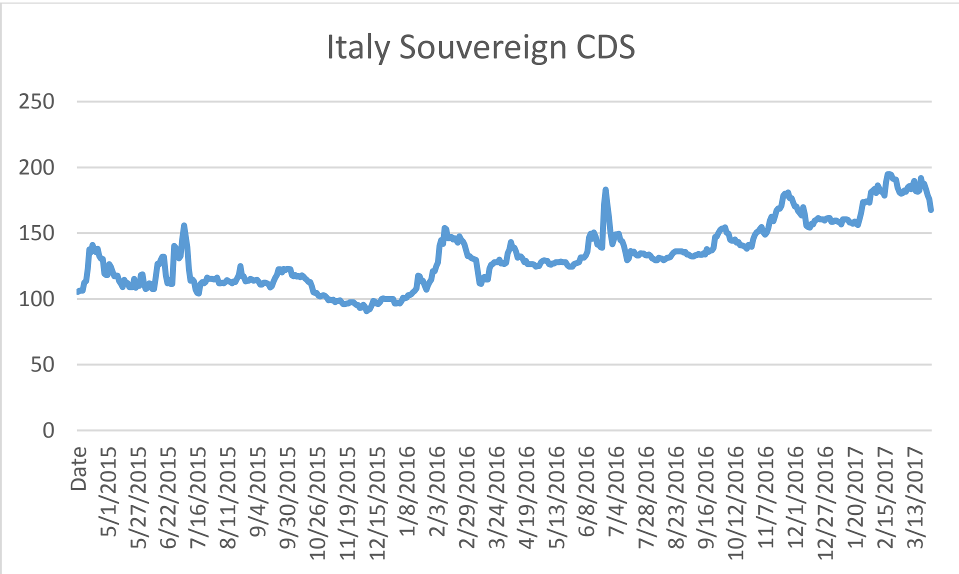


Table 3. The average effect of the event (t-1, t, t+1) dummies on abnormal CDS spread changes, for the whole bank sample from the EU (CDS model, grey: significant)

OLS, using observations 1-465 Dependent variable: Abnormal CDS differences, basis points Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.0442	0.1216	0.3636	0.7163	
D_Event_6	−0.1491	0.2915	−0.5115	0.6093	
D_Event_5	−0.4515	0.6523	−0.6922	0.4892	
D_Event_4	−1.1146	0.2764	−4.033	<0.0001	***
D_Event_3	−3.4672	2.2720	−1.526	0.1277	
D_Event_2	−1.6447	0.8060	−2.040	0.0419	**
D_Event_1	0.1393	0.2221	0.6273	0.5307	

4.3) Comparative analysis

The results of the stock return and CDS spread models show significant but not fully consistent results. Event 2) and 4) does not have a significant impact in the stock return model but they have a strong negative impact in almost every cluster of the CDS observations. Event 3) has a significant negative impact on stock market returns but it also comes with a negative impact on CDS spreads contradicting the hypothesis about their relations. However, accepting the consensus of the literature that CDS is a better indicator to show bail-out expectations, we can have relevant conclusion from the outcome of the model.

The negative impact of Event 2) and 4) on CDS spreads indicates that both the establishment of a fund for private bail-out and an actual implementation of such bail-out decreases bail-in expectations in the market. The interpretation of these events can follow two narratives. First, the indirect impact of the new framework's bail-in policy: banking institutions on the edge of insolvency have more incentive to find private solutions instead of counting on a resolution process including state-aid. Second, the resolution under the new resolution regime is not acceptable by the Italian government, for this, although it was possible to organize a private bail-out now, there is a greater chance for an actual state bail-out in the future.

This narrative of the changes in bail-out expectations would show the credibility and the effectiveness of the new bail-in tool, despite the actual decrease in bail-in expectations. The market expects lower risk for the write-down of these CDSs because there is an increase in the private bail-out expectations. The objective of not using the tax payers' money for state bail-outs in these cases are fulfilled, for this these events are positive signs of the functioning of the new bank resolution system.

However, if the market considers these events as a proof of the government's commitment to avoid bail-in, the decrease in CDS spreads indicates the decrease the credibility of the new resolution regime. The market expects with higher chances a bail-out in Italy without the proper application of the bail-in tool, and these expectations channeled into an EU wide decrease in bail-in expectations.

The impact of Event 3) indicates the market reaction for two opposing event: the bail-out proposal of the Italian Prime Minister and the decline of this proposal by strongly endorsing the new resolution framework by the German Chancellor. The decrease in CDS spreads shows that the bail-out initiative by Prime Minister Renzi had a greater impact than its decline by Angela Merkel. This result of the model shows that the credibility of the enforcement of the bail-in tool was harmed by the Italian efforts, and the German verbal intervention was not enough for the market to regain the level of the previous level of credibility. The market considers the violation of the BRRD regulations a more viable option than before, and not just in the Italian banking market.

The surprising result of both model that the bail-in (or maybe bail-out) of the Monte dei Paschi did not have significant impact on the expectations considering its overall effect in the observation time frame. The explanation for this was possibly the gradual nature of the built-up of the rescue program which made the actual announcement less consequential. Another element behind the non-significance could be unclear responses from the EU authorities. Finally, the applied methodology could be also relevant in the phenomenon as the CDS spreads refer to senior bonds on which the proposed program may had less significant impact.

Conclusion and policy relevance

The formulation of the new bank resolution mechanism in the European Union was determined by the intent to avoid using state funds – the "tax-payers money" – in future bank resolution procedures. The wish to avoid the well-known bail-out programs came after several EU countries fall into a sovereign debt crises as their deficit skyrocketed partly because the burden of these bail-out programs. The EU authorities intended to stop the loop between sovereign debt crises and bank insolvency, and they wanted to do it by limiting the state aid and reducing bail-out expectations, introducing the bail-in mechanism to impose most of the burden on the stakeholders and the creditors of the failing banks.

The management of the escalating Italian banking crises challenged this policy several times. Large part of the bail-in basis was owned by politically important groups of the Italian society, what together with the populist pressure on the government made it rewarding for the Italian government to avoid the implementation of the new bail-in mechanism. The pressure to do private bail-outs, the political messaging, finally the actual establishment of a state-aid fund was all aimed to avoid applying the bail-in tool on the Italian banks, while the markets followed the events with careful attention as they were also tested the will of the EU to maintain the principles of the BRRD framework.

My thesis evaluated the impact of the bail-in relevant events of the Italian banking crises on bail-in expectations, contributing to the literature on empirical researches of bail-in expectations in the EU. Although the bail-in event of the Italian MPS bank did not have similar significant impact as the bail-in events examined by Schafer et al. (2016) – arguably because it's controversial, bail-out like features – there were several significant results of the applied empirical models.

These result show that the private bail-out funds and actual private bail-out programs decreased the bail-in expectations. There is two narrative behind that relation: the market expected less bail-in because of higher expectations for private bail-outs, or because they interpreted these programs as a sign of the governments' unwillingness to accept bank failings under the new resolution framework. Another significant result of my model that the introduction of a new public bail-out fund reduced bail-in expectation even when the most decisive voice – the German Chancellor – endorsed to respect the principles of the BRRD framework.

These results show that the credibility of the enforceability of the new bail-in tool has been challenged by the events of the way how the Italian authorities managed the banking crises. In order to decrease future bail-out expectations and maintain the credibility of the bail-in regime, the EU authorities should focus on avoiding two danger. First, the introduction of a bail-out program by the member states, even if it only remains in the plan phase. Second, the market interpretation of state initiated private bail-out funds and actual rescues as a sign of lack of commitment to the bail-in regime.

In order to avoid bail-out plans, the EU authorities should prove that they are committed to the new resolution framework and bail-out proposals do not meet with approval unless it is necessary matching the conditions of the escape clause. They should decline any attempt abusing the escape clause of the resolution scheme, in particular the compensation scheme planned by the Italian government to help the junior bondholders of MPS.

There should be also a clear rhetoric to emphasize that even if there is a state contribution in the organizational effort to form private bail-out funds or implement a private bail-out, there will be no actual financial contribution by the state. It should be strongly stated that even if the governments are supporting in non-financial ways these private bail-outs, they are not afraid to implement the bail-in tool if the efforts for private solutions are failing.

If the EU is capable to uphold the credibility of the new resolution regime with these measures, then the break of the loop between bank insolvency and sovereign debt can be achieved, moreover the EU will be in much better position to react to a new financial crises without imposing the direct burden of bank failures on the state budgets.

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Appendix 1 – List of banks included in the analysis

Table 4. Banks included in the stock return analysis (1)

Banks included for the stock return analysis (1)				
Name of the bank	Country	GIPS	GSIB	Stress
BMPS	Italy	X		X
BANCA CARIGE	Italy	X		
Banca Finnat	Italy	X		
BANCA MONTE DEI PASCHI DI SIENA	Italy	X		
BANCA POPOLARE DI SONDRIO	Italy	X		
Banca Profilo	Italy	X		
CREDITO EMILIANO	Italy	X		
BANCA PICCOLO CREDITO VALTELLINESE	Italy	X		
Banco di Desio	Italy	X		
Banco di Sardagne	Italy	X		
Bper Banca	Italy	X		
Finecobank	Italy	X		
INTESA SANPAOLO	Italy	X		
MEDIOBANCA	Italy	X		
UNICREDIT	Italy	X	X	X
ERSTE GROUP BANK	Austria			
RAIFFEISEN BANK INTERNATIONAL	Austria			X
DEXIA	Belgium			
KBC	Belgium			
KOMERCNI BANKA	Czecz Republic			
DANSKE BANK	Denmark			
JYSKE BANK	Denmark			
RINGKJOBING LANDBOBANK	Denmark			
SYDBANK	Denmark			
BNP PARIBAS	France		X	
CIC	France			
CREDIT AGRICOLE	France		X	
NATIXIS	France			
SOCIETE GENERALE	France		X	X
COMMERZBANK	Germany			X
DEUTSCHE BANK	Germany		X	X
IKB	Germany			
QUIRIN BANK	Germany			
AAREAL BANK	Germany			
ALPHA BANK	Greece	X		
BANK OF PIRAEUS	Greece	X		
OTP BANK	Hungary			
BANK OF IRELAND	Ireland	X		X

Table 5. Banks included for the stock return analysis (2)

Banks included for the stock return analysis (2)				
Name of the bank	Country	GIPS	GSIB	Risk
LLB	Lichenstein			
VP BANK	Lichenstein			
SPAREBANK 1 SR BANK	Norway			
ING GROEP	Netherlands		X	
VAN LANSCHOT	Netherlands			
BANK POLSKA KASA OPIEKI	Poland			
MBANK	Poland			
BANK HANDLOWY	Poland			
ING BANK SLASKI	Poland			
BANCO COMERCIAL PORTUGUES	Portugal	X		
BANCA COMERCIALA CARPATICA	Romania			
BANCA TRANSILVANIA	Romania			
BANCO DE SABADELL	Spain	X		
BANCO POPULAR ESPANOL	Spain	X		X
BANCO SANTANDER	Spain	X	X	
BANKINTER	Spain	X		
BANCO BILBAO VIZCAYA ARGENTARIA	Spain	X		
CAIXABANK	Spain	X		
NORDEA	Sweden		X	
SEB	Sweden			
SVENSKA HANDELSBANKEN	Sweden			
SWEDBANK	Sweden			
BARCLAYS	United Kingdom		X	X
HSBC	United Kingdom		X	
LLOYDS	United Kingdom			
ROYAL BANK OF SCOTLAND	United Kingdom		X	
STANDARD CHARTERED	United Kingdom		X	

Table 6. Banks included for the CDS spread analysis

Banks included for the CDS spread analysis				
Name of the bank	Country	GIPS	GSIB	Stress
INTESA SANPAOLO	Italy	X		
MEDIOBANCA	Italy	X		
UNICREDIT	Italy	X	X	X
BANCA NAZIONALE DEL LAVORO	Italy	X		
ERSTE GROUP BANK	Austria			X
RAIFFEISEN ZENTRALBANK	Austria			
DANSKE BANK	Denmark			
SOCIETE GENERALE	France		X	X
BNP PARIBAS	France		X	
CREDIT AGRICOLE	France		X	
NATIXIS*	France			
BAYERISCHE LANDESBANK	Germany			
COMMERZBANK	Germany			X
DEUTSCHE BANK	Germany		X	X
LANDESBANK BADEN WUERTTEMBERG	Germany			
UNICREDIT BANK (HVB)	Germany			
ING BANK	Netherlands		X	
DNB BANK	Norway			
BANCO COMERCIAL PORTUGUES	Portugal	X		
BANCO SABADELL	Spain	X		
BANCO POPULAR ESPANOL	Spain	X		X
ANCO SANTANDER	Spain	X	X	
BANKINTER	Spain	X		
BANCO BILBAO VIZCAYA ARGENTARIA	Spain	X		
SEB	Sweden			
SVENSKA HANDELSBANKEN	Sweden			
SKANDINAVIA ENSKILDE BANKEN	Sweden			
NORDEA	Sweden		X	
SWEDBANK	Sweden			
ROYAL BANK OF SCOTLAND	United Kingdom		X	
HSBC	United Kingdom		X	
SANTANDER UK	United Kingdom			
STANDARD CHARTERED	United Kingdom		X	

Appendix 2 – Methodology and regression results for cluster analysis

Equitation 3. Comparison the impact of the events in specific clusters – methodology

Comparison the impact of the events in specific clusters – methodology

The methodology to calculate abnormal returns is the same as in case of the stock return and CDS spread model for the whole sample. Then the abnormal returns are used to calculate the impact of the events on the specific cluster following the equation:

$$AR_{it} = \alpha_i + \beta_1 D_{event} + \beta_2 D_{event} D_{cluster} + \beta_3 D_{cluster}$$

Where

AR_{it}re denotes the bank (i) specific abnormal returns for every period (t),

α_i denotes the bank (i) specific intercept (near zero as the dependent variable is AR)

R_{Mt} denotes the market (m) return of the given (t) day

D_{event} denotes the dummy variable for the examined events (n) for the days on (t), prior (t-1) and after (t+1) the event

$D_{cluster}$ denotes the dummy variable indicating the examined cluster (Italy, GIIPS, G-SIB, Stress)

β_1 denotes the coefficient determining the impact of the event on abnormal returns for the whole sample, fixed for the cluster specific trends.

β_2 denotes the coefficient determining the impact of the event on abnormal returns for the examined cluster, fixed for the cluster (but not event) specific trends and overall trends of the abnormal returns. If β_2 is significant then in the cluster the event have different impact then in the overall sample.

β_3 denotes the average cluster specific trend of the abnormal returns, fixed for the event specific trends.

Table 7. Regression results for evaluating the impact of the events on the Italian banks (stock return model, grey: significant)

OLS, using observations 1-1012 (n = 966) Missing or incomplete observations dropped: 46 Dependent variable: Average abnormal stock returns Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−0.0004	0.0004	−0.8549	0.3928	
Italy	−0.0020	0.0008	−2.496	0.0127	**
D_Event_6	−0.0022	0.0021	−1.024	0.3060	
D_Italy * D_Event_6	−0.0013	0.0045	−0.2867	0.7744	
D_Event_5	0.0071	0.0070	1.002	0.3165	
D_Italy * D_Event_5	0.0062	0.0155	0.3994	0.6897	
D_Event_4	−0.0009	0.0048	−0.1767	0.8598	
D_Italy * D_Event_4	−0.0016	0.0088	−0.1764	0.8600	
D_Event_3	−0.0114	0.0044	−2.587	0.0098	***
D_Italy * D_Event_3	−0.0143	0.0104	−1.370	0.1711	
D_Event_2	0.00438	0.0052	0.8383	0.4021	
D_Italy * D_Event_2	0.0120	0.0126	0.9562	0.3392	
D_Event_1	−0.0008	0.0046	−0.1768	0.8597	
D_Italy * D_Event_1	0.00198	0.0067	0.2964	0.7670	

Table 8. Regression results for evaluating the impact of the events on GIIPS banks (stock return model, grey: significant)

OLS, using observations 1-1012 (n = 966) Missing or incomplete observations dropped: 46 Dependent variable: Average abnormal stock returns Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−0.000355000	0.000415259	−0.8549	0.3928	
D_GIIBS	−0.000977710	0.000775189	−1.261	0.2075	
D_Event_1	−0.000816667	0.00461888	−0.1768	0.8597	
D_GIIPS* D_Event1	0.00523920	0.00765377	0.6845	0.4938	
D_Event_2	0.00437545	0.00521943	0.8383	0.4021	
D_GIIPS * D_Event2	0.00703215	0.00917360	0.7666	0.4435	
D_Event_3	−0.0113885	0.00440288	−2.587	0.0098	***
D_GIIPS * D_Event3	−0.0119075	0.00917492	−1.298	0.1947	
D_Event_4	−0.000853942	0.00483242	−0.1767	0.8598	
D_GIIPS * D_Event4	−0.00278439	0.00986064	−0.2824	0.7777	
D_Event_5	0.00705497	0.00703967	1.002	0.3165	
D_GIIPS * D_Event5	0.00769947	0.0113363	0.6792	0.4972	
D_Event_6	−0.00215726	0.00210633	−1.024	0.3060	
D_GIIPS * D_Event6	−0.00285418	0.00382732	−0.7457	0.4560	

Table 9. Regression results for evaluating the impact of the events on the GSIB banks (stock return model, grey: significant)

OLS, using observations 1-1012 (n = 970) Missing or incomplete observations dropped: 42 Dependent variable: Average abnormal stock returns Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−0.000355000	0.000415246	−0.8549	0.3928	
D_GSIB	−0.00111300	0.000653354	−1.704	0.0888	*
D_GSIB* D_Event1	−0.000816667	0.00461874	−0.1768	0.8597	
D_Event_2	−0.00391159	0.00638760	−0.6124	0.5404	
D_GSIB * D_Event2	0.00437545	0.00521928	0.8383	0.4021	
D_Event_3	0.0127428	0.00831867	1.532	0.1259	
D_GSIB * D_Event3	−0.0113885	0.00440275	−2.587	0.0098	***
D_Event_4	−0.0101660	0.00218218	−4.659	<0.0001	***
D_GSIB * D_Event4	−0.000853942	0.00483228	−0.1767	0.8598	
D_Event_5	−0.00309770	0.00768595	−0.4030	0.6870	
D_GSIB * D_Event5	0.00705497	0.00703945	1.002	0.3165	
D_Event_6	0.0131628	0.0123899	1.062	0.2883	
D_GSIB * D_Event6	−0.00215726	0.00210626	−1.024	0.3060	
D_GSIB* D_Event1	−0.000225900	0.00298274	−0.07574	0.9396	

Table 10. Regression results for evaluating the impact of the events on the banks stock returns who were the most vulnerable in the 2016 stress test (stock return model, grey: significant)

OLS, using observations 1-1012 (n = 966) Missing or incomplete observations dropped: 46 Dependent variable: Average abnormal stock returns Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−0.000355000	0.000415259	−0.8549	0.3928	
D_STRESS	−0.00110663	0.000836228	−1.323	0.1860	
D_Event_1	−0.000816667	0.00461888	−0.1768	0.8597	
D_STRESS * D_Event_1	0.00257048	0.00646364	0.3977	0.6910	
D_Event_2	0.00437545	0.00521943	0.8383	0.4021	
D_STRESS * D_Event_2	0.0150480	0.00995776	1.511	0.1311	
D_Event_3	−0.0113885	0.00440288	−2.587	0.0098	***
D_STRESS * D_Event_3	−0.0163982	0.00699512	−2.344	0.0193	**
D_Event_4	−0.000853942	0.00483242	−0.1767	0.8598	
D_STRESS * D_Event_4	−0.00317137	0.0125500	−0.2527	0.8006	
D_Event_5	0.00705497	0.00703967	1.002	0.3165	
D_STRESS * D_Event5	0.00997053	0.0145520	0.6852	0.4934	
D_Event_6	−0.00215726	0.00210633	−1.024	0.3060	
D_STRESS * D_Event_6	−0.00770880	0.00495504	−1.556	0.1201	

Table 11. Regression results for evaluating the impact of the events on Italian banks (CDS model, grey: significant)

Model 1: OLS, using observations 1-930 Dependent variable: Average abnormal CDS differences, basis points Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.0442287	0.121640	0.3636	0.7162	
Italy	0.111946	0.228801	0.4893	0.6248	
D_Event_1	0.139345	0.222117	0.6273	0.5306	
D_Italy * D_event_1	0.632665	0.394100	1.605	0.1088	
D_Event_2	−1.64465	0.806011	−2.040	0.0416	**
D_Italy_D_Event_2	−5.55959	1.72115	−3.230	0.0013	***
D_Event_3	−3.46716	2.27204	−1.526	0.1274	
D_Italy * D_Event_3	−8.83367	2.68248	−3.293	0.0010	***
D_Event_4	−1.11460	0.276389	−4.033	<0.0001	***
D_Italy * D_Event_4	−4.03174	1.58250	−2.548	0.0110	**
D_Event_5	−0.451522	0.652346	−0.6922	0.4890	
D_Italy * D_Event_5	−1.68459	2.02811	−0.8306	0.4064	
D_Event_6	−0.149112	0.291544	−0.5115	0.6092	
D_Italy * D_Event_6	−0.456503	0.510350	−0.8945	0.3713	

Table 12. Regression results for evaluating the of the events on GIIPS banks (CDS model, grey: significant)

OLS, using observations 1-930
Dependent variable: Average abnormal CDS differences, basis points
Heteroskedasticity-robust standard errors, variant HC1

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.0442287	0.121640	0.3636	0.7162	
D_GIIPS	0.0744950	0.234445	0.3178	0.7507	
D_Event_1	0.139345	0.222117	0.6273	0.5306	
D_GIIPS_D_event_1	−0.0103651	0.250773	−0.04133	0.9670	
D_Event_2	−1.64465	0.806011	−2.040	0.0416	**
D_GIIPS_D_Event_2	−4.21930	1.30644	−3.230	0.0013	***
D_Event_3	−3.46716	2.27204	−1.526	0.1274	
D_GIIPS_D_Event_3	−9.19963	2.21333	−4.156	<0.0001	***
D_Event_4	−1.11460	0.276389	−4.033	<0.0001	***
D_GIIPS_D_Event_4	−2.22892	0.862706	−2.584	0.0099	***
D_Event_5	−0.451522	0.652346	−0.6922	0.4890	
D_GIIPS_D_Event_5	−1.15573	1.19518	−0.9670	0.3338	
D_Event_6	−0.149112	0.291544	−0.5115	0.6092	
D_GIIPS_D_Event_6	−0.0799490	0.306713	−0.2607	0.7944	

Table 13. Regression results for evaluating the impact of the events on G-SIB banks (CDS model, grey: significant)

OLS, using observations 1-930
Dependent variable: Average abnormal CDS differences, basis points
Heteroskedasticity-robust standard errors, variant HC1

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.0442287	0.121640	0.3636	0.7162	
D_G-SIB	0.0121161	0.204401	0.05928	0.9527	
D_Event_1	0.139345	0.222117	0.6273	0.5306	
D_G-SIB * D_event_1	0.583870	0.365778	1.596	0.1108	
D_Event_2	−1.64465	0.806011	−2.040	0.0416	**
D_G-SIB * D_Event_2	−2.56254	1.02602	−2.498	0.0127	**
D_Event_3	−3.46716	2.27204	−1.526	0.1274	
D_G-SIB * D_Event_3	−3.65678	3.08600	−1.185	0.2363	
D_Event_4	−1.11460	0.276389	−4.033	<0.0001	***
D_G-SIB * D_Event_4	−0.952227	0.287041	−3.317	0.0009	***
D_Event_5	−0.451522	0.652346	−0.6922	0.4890	
D_G-SIB * D_Event_5	−0.712792	0.960176	−0.7424	0.4581	
D_Event_6	−0.149112	0.291544	−0.5115	0.6092	
D_G-SIB * D_Event_6	−0.505988	0.572636	−0.8836	0.3771	

Regression results for evaluating the impact of the events on G-SIB banks

Table 14. Regression results for evaluating the impact of the events on banks who were the most vulnerable in the stress test in 2016 (CDS model, grey: significant)

OLS, using observations 1-930 Dependent variable: Average abnormal CDS differences, basis points Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.0442287	0.121640	0.3636	0.7162	
D_Stress	0.0449926	0.211885	0.2123	0.8319	
D_Event_1	0.139345	0.222117	0.6273	0.5306	
D_Stress_D_event_1	0.623395	0.620351	1.005	0.3152	
D_Event_2	−1.64465	0.806011	−2.040	0.0416	**
D_Stress * D_Event_2	−3.29376	1.20606	−2.731	0.0064	***
D_Event_3	−3.46716	2.27204	−1.526	0.1274	
D_Stress_D * Event_3	−5.74740	1.99602	−2.879	0.0041	***
D_Event_4	−1.11460	0.276389	−4.033	<0.0001	***
D_Stress * D_Event_4	−2.24789	0.630673	−3.564	0.0004	***
D_Event_5	−0.451522	0.652346	−0.6922	0.4890	
D_Stress * D_Event_5	−1.07831	1.06999	−1.008	0.3138	
D_Event_6	−0.149112	0.291544	−0.5115	0.6092	
D_Stress *D_Event_6	−1.02134	0.635621	−1.607	0.1084	

Table 15. Regression result for evaluating the impact of the events, if for Event 3) the day prior the event is not included in the dummy (stock return model, grey: significant)

OLS, using observations 1-506 (n = 399) Missing or incomplete observations dropped: 107 Dependent variable: Average abnormal stock returns Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−0.000436471	0.000466368	−0.9359	0.3499	
D_Event_6	9.41074e-05	0.000954105	0.09863	0.9215	
D_Event_5	0.00713644	0.00705375	1.012	0.3123	
D_Event_4	0.000375429	0.00710791	0.05282	0.9579	
D_Event_3	−0.0113070	0.00441476	−2.561	0.0108	**
D_Event 2	0.00445692	0.00523179	0.8519	0.3948	
D_Event 1	−0.000735196	0.00463086	−0.1588	0.8739	

Table 16. The impact of Event 3) on abnormal stock returns on the event day (t) and prior (t-1) and after (t+1) (stock return model, grey: significant)

OLS, using observations 1-506 (n = 399) Missing or incomplete observations dropped: 107 Dependent variable: Average abnormal stock returns Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−0.000351365	0.000456166	−0.7703	0.4416	
D_Event_3 (t-1)	−0.0212015	0.000456166	−46.48	<0.0001	***
D_Event_3 (t)	−0.0100981	0.000456166	−22.14	<0.0001	***
D_Event_3 (t+1)	−0.00287677	0.000456166	−6.306	<0.0001	***

Table 17. The impact of Event 3) on abnormal CDS difference on the event day (t) and prior (t-1) and after (t+1) (CDS model, grey: significant))

OLS, using observations 1-465 Dependent variable: Abnormal CDS differences, basis points Heteroskedasticity-robust standard errors, variant HC1					
	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.0131922	0.117393	0.1124	0.9106	
D_Event_3 (t-1)	−6.01389	0.117393	−51.23	<0.0001	***
D_Event_3 (t)	−7.50305	0.117393	−63.91	<0.0001	***
D_Event_3 (t+1)	4.12044	0.117393	35.10	<0.0001	***