



UNIVERSITA' DEGLI STUDI DI PADOVA

**DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI
"M. FANNO"**

**CORSO DI LAUREA MAGISTRALE IN
ECONOMICS AND FINANCE**

TESI DI LAUREA

ASSESSING THE BANK RECOVERY AND RESOLUTION DIRECTIVE

RELATORE:

CH.MO PROF. Bruno Maria Parigi

LAUREANDO: Mario Sivero

MATRICOLA N. 1331519

ANNO ACCADEMICO 2016 – 2017

Il candidato dichiara che il presente lavoro è originale e non è già stato sottoposto, in tutto o in parte, per il conseguimento di un titolo accademico in altre Università italiane o straniere.

Il candidato dichiara altresì che tutti i materiali utilizzati durante la preparazione dell'elaborato sono stati indicati nel testo e nella sezione "Riferimenti bibliografici" e che le eventuali citazioni testuali sono individuabili attraverso l'esplicito richiamo alla pubblicazione originale.

Firma dello studente

Table of Contents

Introduction	3
1 Financial Crisis and European banking regulatory framework	5
1.1 Global financial crisis and European financial sector	5
1.2 European Banking regulation system	8
1.3 Basel III and CRD IV – CRR regulatory frameworks.....	11
1.3.1 Capital components and characteristics.....	13
1.3.2 Additional capital buffers	15
1.3.3 Pillar II capital	18
2 The Bank Recovery and Resolution Directive - BRRD	21
2.1 BRRD’s rationales and objectives	21
2.2 Resolution preventive and preparatory tools	23
2.2.1 Prevention measures	24
2.2.2 Preparatory measures.....	26
2.3 The Bail-In tool.....	27
2.3.1 Instruments’ hierarchy under Bail-In	30
2.4 Minimum Requirement for Own Funds and Eligible Liabilities (MREL)	32
2.4.1 MREL characteristics	32
2.4.2 MREL and TLAC relationship.....	36
2.4.3 MREL state of play in UK and Sweden	38
2.4.4 Future developments in MREL regulation	40
2.5 Bank resolution and Bail-in cases after the BRRD.....	42
3 MREL quantitative assessment	45
3.1 Rationale to evaluate the MREL in European banks	45
3.2 Literature review.....	46
3.3 Data.....	48
3.4 MREL assessment.....	49
3.4.1 MREL ratios	49

3.4.2	Supervisory requirements assessment	52
3.4.3	MREL instruments deficit assessment	53
3.4.4	Funding costs evaluation in previous studies	55
3.4.5	Debt instruments pricing tools.....	57
3.4.6	Evaluating MREL costs.....	58
3.4.7	Assessing MREL benefits	63
3.4.8	Panel data analysis.....	64
4	Conclusions	69
5	Annexes	71
5.1	Annex A.....	71
5.2	Annex B	72
5.3	Annex C	72
5.4	Annex D.....	73
5.5	Annex E	74
6	List of figures	75
7	References	76

Introduction

The global financial crisis of 2007 - 2008 showed the weaknesses of the international banking system and unveiled the lack of tools available to handle failing financial institutions, without interrupting their ability to carry on their main functions towards the real economy.

Since that time, the sovereign authorities began to strengthen the pre-existing banking regulations and to introduce new regimes for the recovery and resolution of financial institutions. The European authorities replied to this necessity adopting the Bank Recovery and Resolution Directive (BRRD) in 2014.

The new banking resolution framework provides a set of tools on how to handle a bank crisis, in a way that minimizes the overall costs of their failure for national governments and taxpayers. Among the wide array of new resolution instruments introduced by the BRRD, the “Bail-in” tool represents the most innovative one, by which the failing banks can be rescued by its own equity and debt holders without any public support. Nevertheless, since the BRRD came into force, the European authorities used only partially this tool or avoided it all to manage the failure of a bank.

This fact suggests the existence of a major flaw in the current regulatory framework, by which the national governments can easily circumvent the BRRD rules to avoid the negative spillovers on the economy that a full-scale Bail-in of a financial institution could cause.

However, it is uncertain how the European governments could handle the failure of a big or even systemically important banking group. In this event, its rescue would be possible only with a large Bail-in, otherwise there would be the need of a massive injection of public funds to finance the bail-out.

Therefore to avoid an onerous sovereign rescue, it is mandatory at least for the biggest banks to hold an amount of resources that allows the possible application of a Bail-in process.

To ensure it, the BRRD already introduced a new capital requirement, the minimum requirement for own funds and eligible liabilities (MREL) addressed to all the European banks. The BRRD foresaw its entry into force from January 2016; nevertheless so far, only two national supervisory authorities took their own decision on how implementing it.

In the current regulatory system, the MREL shares the same purposes with another supervisory standard, the Total Loss-Absorption Capacity (TLAC), introduced by the Basel Committee on Banking Supervision in 2015. Given that the two frameworks overlap, the European authorities already suggested to amend the actual MREL norms merging the two requirements to avoid an overabundant regulation.

Seen all these reasons, to make finally possible the full application of a bank Bail-in, the European authorities will enforce the MREL soon. Nevertheless, the approaches on how implement it and its impacts on the performances and financial stability of the European banks are uncertain.

Therefore in this work, we try to assess the current capability of a sample of European systemic banks to go through a Bail-in process, analysing the amount and composition of their resources eligible to be counted into the MREL. Then we provide an estimate of the costs and benefits that the same banks will face in the near future to conform to the most likely amendments in the regulatory discipline. This present work is organised as follows.

In Chapter 1, we will describe the evolution of the European banking regulatory framework from the start of the financial crisis in 2007 until the adoption of the BRRD in 2014, illustrating the establishment of the EU Banking Union and the Basel III system of minimum capital requirements.

In Chapter 2, we will introduce the Banking Recovery and Resolution Directive (BRRD), placing a great focus on the “Bail-in” tool and the MREL, providing a description of the relationship with the TLAC standard and the likely evolution of its regulation. In the end, to discuss these topics from an empirical point of view, we will describe some recent cases of bank resolution occurred in the European Union.

In Chapter 3, after a brief illustration of the thesis’s rationales and the literature review, we will perform a MREL quantitative assessment on a sample of systemic European banks to highlight their current ability to go through a Bail-in process. In addition, we will carry out a scenario analysis giving an estimate of the costs the same banks will face in the following years to adjust to the likely future regulatory choices. To conclude our assessment, we will analyse the benefits of an enhancement in the supervisory regulation from another point of view, considering the relationship between the regulatory capital and the CDS premia of a bank.

The outcomes may overturn the current regulator’s belief that the strengthening of the capital requirements will considerably increase the creditworthiness of a bank.

Finally, in the conclusions we will restate the purposes of this work, summarising the results obtained and highlighting its key differences compared to the previous studies.

1 Financial Crisis and European banking regulatory framework

1.1 Global financial crisis and European financial sector

The first decade of the new century saw a financial crisis of a similar size to the one that brought to Great Depression in 1930s. Just like that time, in the USA the banking system played a crucial role in the beginning and diffusion of the crisis, but differently from the past, actual economic policies resulted to be more targeted and certainly more effective to tackle crisis's consequences. The authorities' mistakes made during the 1930s led to the Great Depression while after the begin of the subprime crisis, the American recession lasted less than two years. The subprime crisis, that started in 2007, represents a turning point both for the economic policies implemented and for the banking system's regulatory framework enforcement in United States and in Europe. This time, the governments undertook impressive fiscal interventions worldwide to restore financial stability and keep the markets calm, avoiding what otherwise could have become a system-wide financial and economic catastrophe.

The exceptional financial instability and unpredictable contagion risks triggered fast and decisive actions by sovereigns and central banks. In fact, the reserve banks' quantitative easing programs pumped billions of USD of liquidity, to Bail-out¹ all the financial institutions considered 'too big to fail' and getting rid of structured products and subprime assets, whose widespread presence and toxicity represented one of the crisis' main causes helping to boost the contagion effects.

When the first part of the crisis was over, the authorities created new rules to reduce the possible negative effects of new banking crises, without the purpose to save the distressed institution at all costs, but to preserve the creditworthiness of the banking system and at the same time minimizing the negative effects of their failures for the whole society.

Even though the economic recovery already began in 2010, only three years later the start of the subprime crisis, in Europe began to appear the first signals of the sovereign debt crisis.

In fact, during 2010 the surge of European "peripheral" countries' spreads began, quickened by the investors' belief that the national governments would have bought a large amount of toxic assets to relieve the distressed banks, decreasing the creditworthiness of the public finances.

¹ A bailout is a situation in which a business, an individual or a government offers money to a failing business to prevent the consequences that arise from the business's downfall (Financial Times Lexicon).

Thus, several reasons contributed to the sharp increase of European peripheral sovereign risk premia including the subprime crisis’s remnants, bail-outs, support programmes of national authorities to domestic banks and inefficient European coordination policies.

The nexus between Sovereign and bank credit risk, the so called “diabolic loop”, was the hallmark of the sovereign debt crisis in Greece, Ireland, Italy, Portugal, and Spain, where the deterioration of sovereign creditworthiness decreased the market value of government debt held by domestic banks. This fact reduced the perceived solvency of domestic banks and furtherly curtailed their lending activity.

The resulting distress increased the likelihood that banks would have to be rescued by their own national governments, which increased sovereign instability even further.

In addition, the credit crunch resulted in a reduction in tax revenues, which also weakened government solvency in these countries, triggering a “real-economy loop”.

Figure 1 shows the simultaneous loops between Sovereign and banking debt risks.

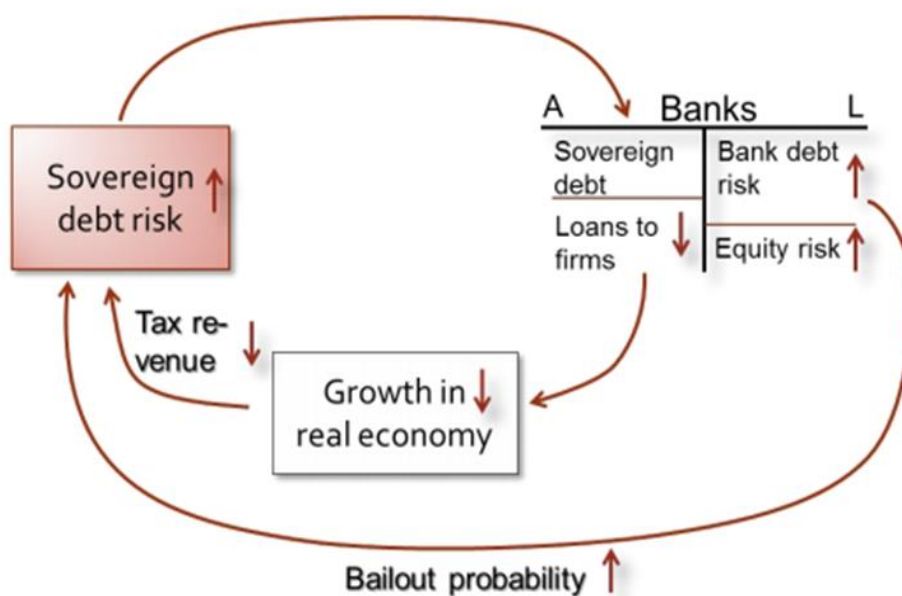


Figure 1 - *Two Diabolic Loops* (Brunnermeier et al. 2011)

Therefore, the banking system carried out a dual role in the sovereign debt crisis: several peripheral member states were unable to repay or refinance their government debt and/or to bail-out their “domestic” banks without assistance from the European Central Bank (ECB), or the International Monetary Fund (IMF). While in some countries, like Italy, the sovereign debt crisis affected directly the domestic banks through a severe decline of the market values of sovereign bonds.

To provide direct assistance to euro-area member states experiencing distress and financing difficulties, the EU authorities created the European Stability Mechanism (ESM)², a special vehicle able to ensure financial support that may also directly recapitalize financial institutions as instrument of last resort.

The entangled relationship between sovereign and banking institutions provided impetus for the birth BRRD that aims to break or at least to reduce their connection. In fact, the underlying idea of the directive is that the governments and taxpayers should not bear any more the costs of banks' mistakes, justifying the implementation of a disciplined resolution framework for troublesome banks.

To summarize, the financial crisis highlighted a lack of effective means of dealing with institutions deemed "too big to fail" because of potential systemic impact of their failure.

To cope with these issues, the G20 called for a strengthened cooperation on international crisis prevention to allow an orderly resolution of financial institutions including systemic ones, without any need of a bail-out policy.

Therefore since that time, the regulatory authorities reacted by developing new policies and strengthening banking regulations both on international and national level to enhance financial firms' resilience, to decrease their likelihood to fail, and to reduce the impact on the overall economy in case a firm fails.

In Europe, the financial crisis demonstrated severe shortcomings in the institutional framework mechanism of the European Union (EU) in general, and in the Economic and Monetary Union (EMU) in particular. In fact, there was poor cross-border cooperation in financial supervision and crisis management due also to the existence at the same time of 27 different banking regulatory systems. Hence a system based on ad hoc coordination, proved to be insufficient in an integrated market and even more within a common currency environment. European legislators summed this up in the recitals of the Single Resolution Mechanism regulation as follows:

*"Interbank markets have become less liquid and cross-border bank activities are decreasing due to fear of contagion, lack of confidence in other national banking systems, and in the ability of Member States to support banks"*³.

² European Union (2010) *REGULATION (EU) No 407/2010 of the European Parliament and of the Council, Official Journal of the European Union.*

³ European Union (2014) *REGULATION (EU) No 806/2014 of the European Parliament and of the Council, Official Journal of the European Union.*

To conclude, the perceived risk of fragmentation in the European banking system risked undermining the functioning of the single market for financial services and led to the creation of European Banking Union in June 2012. The European Banking Union has centralized supervisory and resolution powers to boost integration and to restore confidence in the common currency. Its creation represented a milestone and a new starting point in the tangled evolution process of the European banking regulation framework.

1.2 European Banking regulation system

In June 2012, the European Governments decided to establish a Banking Union, improving the European Monetary Union by providing a centralized framework for European banking system regulation. The rationale behind its creation is clearly summarised in this European Commission Report's sentence:

*"A single banking system is the mirror image of a single money. As the vast majority of money is bank deposits, money can only be truly single if confidence in the safety of bank deposits is the same irrespective of the Member State in which a bank operates. This requires single bank supervision, single bank resolution and single deposit insurance"*⁴.

Thus, the Banking Union guarantees a homogenous and harmonized application of EU banking rules, micro and macro supervision, crisis management and banks' resolution applicable in all euro-area countries, with the possibility for non-euro area ones to join it. It is made up of three main pillars:

- I. The Single Supervisory Mechanism (SSM) with the ECB as supranational supervisor
- II. The Single Resolution Mechanism (SRM) with the Single Resolution Board (SRB) responsible for management of distressed banks
- III. The European Deposit Insurance Scheme (EDIS) which is not centralized yet but relies on the same principles in each European Member State

⁴ European Commission (2015) *The Five Presidents' Report: Completing Europe's Economic and Monetary Union*.

Figure 2 shows a clearer view of Banking Union's organisms.



Figure 2 - *European Banking Union organisms and objectives (ECB 2012)*

Since 2010, the European Commission has proposed nearly thirty sets of rules to ensure safer, sounder and more stable EU banking and financial sectors. The Single Rulebook is the term used to identify this set of legislative texts that all financial institutions within European Union must comply with and on which the Banking Union relies on.

The Bank Recovery and Resolution Directive (BRRD) together with the regulations on capital and liquidity requirements (CRD IV and CRR), ensures a unified regulatory structure. The Single Rulebook⁵ consists of a series of regulations adopted by the European Parliament and Council that apply directly to all member states, integrated by directives defined by the European Banking Authority (EBA) that instead need to be transposed into national laws. These legislative measures are further complemented by the EBA technical standards reports and guidelines⁶.

The Single Supervisory Mechanism (SSM)⁷ delivers prudential supervision and it is formed by the national supervisory authorities, together with the European Central Bank (ECB) as head supervisor of banking institutions in the euro-area. Under the SSM, the ECB supervises directly the largest and more important banks, while the single national supervisors continue to monitor the remaining “less significant” banks via indirect ECB supervision.

⁵ European Banking Authority *Single Rulebook*. Retrieved from <http://www.eba.europa.eu/regulation-and-policy/single-rulebook>.

⁶ European Union (2012) *Treaty on European Union and the treaty on the functioning of the Europe Union, Official Journal of the European Union*.

⁷ European Union (2014b) *REGULATION (EU) No 468/2014 of the European Central Bank, Official Journal of the European Union*.

The SSM operates via Joint Supervisory Teams (JSTs)⁸ formed by the staff of the ECB and the relevant national supervisors, including the competent authorities of the countries in which a European bank established subsidiaries or significant cross-border branches. Their main task is to carry out a continuous supervision of significant institutions, performing the Supervisory Review and Evaluation Process (SREP). Therefore, the SSM's primary duty is to unveil and signal when the situation of a European credit institution is worsening and there is a need to intervene.

The second pillar of the Banking Union is the Single Resolution Mechanism (SRM)⁹ that allows an effective management and intervention in banks' resolution, with the purpose to minimize as much as possible the costs for the economy and taxpayers. The Single Resolution Board (SRB) is responsible for banks' resolution planning and decides whether to apply any resolution tool as well as on the use of the Single Resolution Fund (SRF), which is financed by banking institutions and managed by the SRB itself. Both the SRB and the SRF became fully operational in January 2016.

The Single Resolution Mechanism applies, as the Single Supervisory Mechanism does, to all banks in the euro-area and in addition to cross-border institutions. Thus the ECB and the SRB powers in banks' resolution are partially mutually dependent and interlaced. In fact, the first one is the main authority empowered to establish whether an institution is failing or likely to fail, while it is up to second one to trigger the resolution procedure and determine if the other necessary conditions are met. In addition, the SRB decides the specific resolution tools to cope with a failing institution, the so called "resolution plan", through a complicated voting procedure between Member States, with the European Parliament and Council having veto powers.

The Single Resolution Mechanism regulation is complementary to the BRRD and it does not constitute a replacement or a substitute. In fact, the comprehensive transposition of the BRRD and the establishment of a national resolution authority (NRA) by each member state is crucial to achieve the SRB objectives, since its rules must be implemented by local NRAs and only exceptionally it may address orders directly to a bank under resolution.

⁸ European Central Bank *Joint Supervisory Team*. Retrieved from <https://www.bankingsupervision.europa.eu/banking/approach/jst/html/index.en.html>.

⁹ European Union (2014) *REGULATION (EU) No 806/2014 of the European Parliament and of the Council, Official Journal of the European Union*.

As described above, the Single Rulebook contains a wide set of rules to apply to the banking sector. The Basel III international reference framework and its European implementation via CRD IV – CRR regulations made up the backbone of the current banking regulatory system in Europe. In the next paragraph, we will describe both frameworks in detail, with a specific focus on capital requirements and buffers that constitute the main regulatory tools to enhance banking institutions' resilience.

1.3 Basel III and CRD IV – CRR regulatory frameworks

In December 2010, the Basel Committee on Banking Supervision (BCBS) published its own reforms on banking capital and liquidity regulations to address issues which came out during the financial crisis. In fact, one of the main causes the crisis became so harsh was that banks in several countries built up an excessive degree of on and off - balance sheet leverage. This was usually associated with a decrease in quality and quantity of capital resulting into their inability to absorb losses. Therefore, the BCBS objective, to strengthen the regulatory capital system and to enhance banks' capability to face losses during a crisis, resulted in the Basel III framework. Basel III reinforces the Basel II framework rather than substitute it. In fact, while the latter mainly focused on banks' asset side regulations, the new framework mostly targeted to liabilities side items, capital and liquidity. Basel III improves the banking sector's ability to absorb shocks imposing higher capital ratios including new ratios to be met only with common equity and introducing liquidity metrics.

The Basel III framework as its predecessor continues to be made up of three pillars:

- I. Pillar 1 part sets out how to calculate the regulatory capital requirements for credit, market and operational risks
- II. Pillar 2 part sets forth the process by which a bank should review its overall capital regulatory compliance and how the supervisors can evaluate these efforts and take adequate actions in response
- III. Pillar 3 part sets out the disclosure requirements for banks to publish certain details of their risks, capital and risk management features with the purpose of enhancing market discipline

Figure 3 shows the pillars' evolution between Basel II and III.

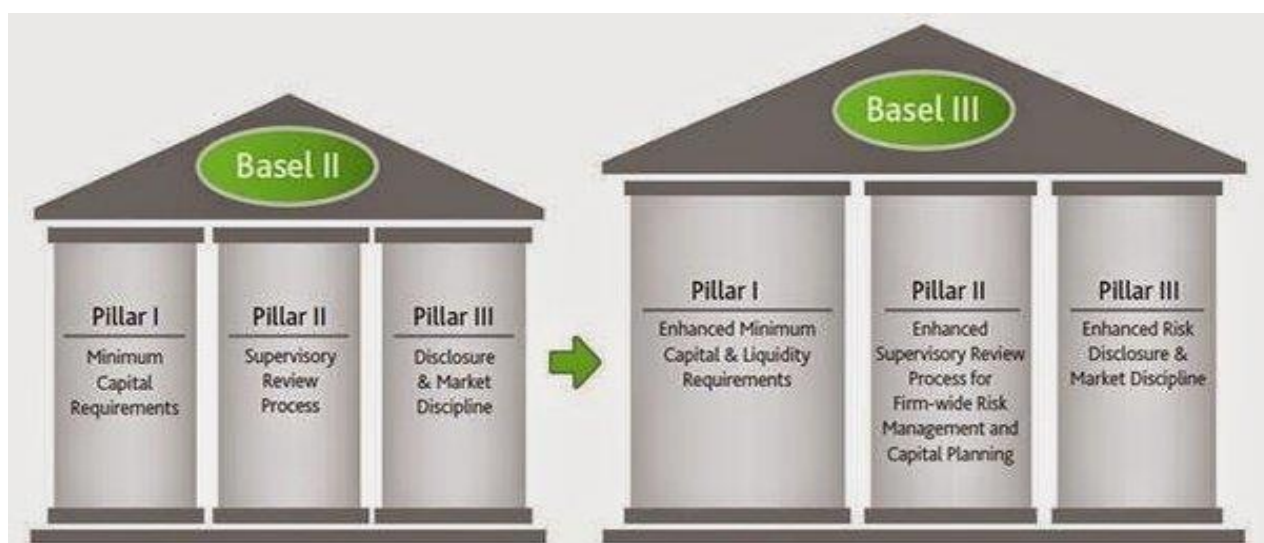


Figure 3 - Pillars' evolution between Basel II and III (Asymptotix website)

The Basel III rules have been implemented in the European Union from the beginning of 2014 via the Capital Requirement Directive IV¹⁰ (CRD IV) and the Capital Requirements Regulation¹¹ (CRR) replacing the Banking Consolidation and Capital Adequacy Directives.

The CRD IV and CRR rules apply to a broad range of credit institutions and investment firms. The CRR has direct application in each European member state, whereas the CRD IV needs to be transposed into national laws. Their scope is to enlarge and strengthen rules concerning banks' capital adequacy. These provisions require a bank to maintain minimum levels of capital, calculated as a percentage of its risk weighted assets¹² (RWAs).

In this context, capital refers to a cushion of cash, reserves, equity and subordinated liabilities, available to the bank to absorb losses during periods of financial instability. In the CRD IV – CRR framework, this cushion consists of two layers (Tiers) of capital: Tier 1, that is further divided into two sub-divisions Common Equity Tier 1 (CET1) and Additional Tier 1 (AT1), and Tier 2. We will describe the capital tiers characteristics and composition in the next subparagraph.

¹⁰ European Union (2013a) *DIRECTIVE 2013/36/EU of the European Parliament and of the Council, Official Journal of the European Union.*

¹¹ European Union (2013b) *REGULATION (EU) No 575/2013 of the European Parliament and of the Council, Official Journal of the European Union.*

¹² The Risk-weighted assets are computed by adjusting each asset class for risk to determine a bank's real-world exposure to potential losses. Regulators then use the risk weighted total to calculate how much loss-absorbing capital a bank needs to sustain it through difficult markets (Financial Times Lexicon).

1.3.1 Capital components and characteristics

As previously described, capital refers to a wide range of items and instruments including cash, reserves, equity and subordinated liabilities. Cash and reserves made up the bank's highest quality capital, since they have not related payment obligations and they can be used promptly to absorb losses.

Capital securities formed by equity, certain types of preferred shares and dated and undated subordinated debt may also be included into bank's regulatory capital, provided that they are endowed with sufficient degrees of permanence (the bank is not subject to any redemption obligation), flexibility in distributions of dividends and / or coupons (the bank has the ability of reduce, suspend or cancel mandatory redemption or payment distribution in a period of financial distress) and instruments' seniority (subordination protects depositors and senior creditors, since deeper subordinated securities holders suffer losses before more senior instruments are affected)¹³.

After this brief introduction of regulatory capital overall characteristics, it is useful to describe in detail the breakdown and features of the regulatory capital components under the CRD IV – CRR framework. As specified above, the EU regulatory framework recognises two layers of capital: Tier 1 and Tier 2.

Tier 1

Tier 1 capital is the highest quality form of bank's capital as it can be used to absorb losses on a "going concern" basis, providing banks with ready to use capital cushions in case of financial distress warding off insolvency.

Common equity Tier 1 (CET 1) is the capital layer composed by the full-strength form of equity and it is constituted by ordinary shares, retained earnings and other cash reserves.

These instruments share several common features. In fact, they have not linked redemption / cancellation costs or mandatory payments for the issuing bank, and their holders have the most subordinated claim in a bank's liquidation event, being only satisfied once the depositors and other creditors have been paid in full.

The CRD IV framework imposes a minimum level for banks to hold of CET 1 with respect to the size of RWAs. The minimum required CET1 ratio is not below the 4,5%.

¹³ Allen and Overy (2014a) *Capital Requirements Directive IV Framework Capital and Capital Adequacy*.

The Additional Tier 1 (AT1) consists of instruments having some equity-like features, which make them able to be written off. AT1 capital consists of instruments that have no maturity and may contain a call option for the issuing bank, if there is not an explicit incentive to redeem, such as coupon step-up clause¹⁴. The instruments can be redeemed only if substituted by others at least of the same quality, furthermore dividends and coupons distributions on these securities can be cancelled or deferred at the bank's discretion.

All AT1 instruments must either convert into ordinary shares or have their principal amount written down, if the ratio of the bank's CET 1 to its total RWAs falls below a trigger level of 5.125% or a higher level, where determined by the institution or specified in the provisions governing the instruments¹⁵, also known as issuer's point of "non-viability" (PONV).

The claims of AT1 instruments will rank above ordinary shareholders in insolvency but will be subordinated to the claims of holders of Tier 2 instruments, senior creditors and depositors.

The CRV IV framework provides for banks at least a Tier 1 ratio of 6% with respect to RWAs. This ratio must be fulfilled by a CET 1 ratio not lower than 4,5% and up to 1,5% of AT1 ratio.

Tier 2

Tier 2 capital is intended to provide an additional buffer to further safeguard senior creditors and depositors in the event of insolvency, and it is therefore re-categorised as a "gone-concern" reserve. Under the Basel III framework, Tier 2 consists of subordinated and hybrid instruments with a maturity of not less than five years. They will tend to have a longer maturity, however, as regulatory amortisation¹⁶ will apply in the final five years to maturity. These securities are typically in bond form or issued as a preference share or loans.

On liquidation event, the claims of Tier 2 instruments holders rank above Tier 1 securities. The CRD IV framework sets forth a minimum level of Tier 2 ratio of at least 2%, to achieve the minimum total capital requirement of 8% on RWAs.

¹⁴ A step-up bond is a bond that pays an initial coupon rate for the first period, and then a higher coupon rate for the following periods (Financial Times Lexicon).

¹⁵ European Union (2013b) *REGULATION (EU) No 575/2013 of the European Parliament and of the Council, Article 54, Official Journal of the European Union.*

¹⁶ The amount of the instrument eligible for Tier 2 capital treatment is amortised on a straight-line basis over the final five years. If "T" is maturity, then at T-5: 100% of the instrument is eligible for inclusion; at T-4: 80%; at T-3: 60%; at T-2: 40%; and at T-1: 20% (Allen and Overy (2014a) *Capital Requirements Directive IV Framework Capital and Capital Adequacy*).

1.3.2 Additional capital buffers

The CRD IV – CRR framework, following recommendations and standards made by the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB), introduces in the European banking regulation new rules requiring the maintenance of certain capital buffers to increase equity capital levels, particularly within global and other systemically important institutions (G-SIIs and O-SIIs).

These requirements aim to strengthen banks' capital adequacy, maintaining additional buffers of Common Equity Tier 1 (CET 1) and seek to limit the ability of banking institutions to make discretionary distributions of their profits. From 2016 onwards, subject institutions will be required to maintain the following additional capital buffers:

- a) Capital Conservation Buffer
- b) Countercyclical Capital Buffer
- c) Global Systemic Institution Buffer (G-SIIs buffer) and Other Systematically Important Institutions Buffer (O-SIIs buffer)
- d) Systemic Risk Buffer

CRD IV set forth transitional provisions for the implementation of all these additional requirements for the period January 2016 to December 2018, the date foreseen for their full entry into force¹⁷. In addition, the extent of the restriction in profit distributions depends on the distance of the bank's CET1 ratio to the minimum capital requirement, nevertheless it is not an absolute constraint. In fact, where an institution fails to meet the Combined Buffer requirements, but it however intends to distribute any of its available profits, it must notify the designated supervisory authority and provide certain information among which the "maximum distributable amount" (MDA)¹⁸.

a) Capital Conservation Buffer

CRD IV requires Member States to impose subject firms to keep an additional common equity Tier 1 equivalent to 2.5% of their total risk exposure. The directive gives national supervisory authorities very limited power to amend this buffer.

¹⁷ Allen and Overy (2014b) *Capital Requirements Directive IV Framework Capital Buffers*.

¹⁸ The "maximum distributable amount" (MDA) is computed by multiplying the amount of bank's distributable profits by a factor (from 0 to 0.6) depending on the how much the institution's common equity does not meet the Combined Buffers (*Ibid.*).

In fact, any measure taken to modify the Capital Conservation buffer by the national regulators, to cope with any alterations in local financial sector risks, must be approved by the European Commission. This approval is a prerequisite for the further implementation.

b) Countercyclical Capital Buffer

The CRD IV introduced the Countercyclical Capital Buffer given that, an excessive credit growth in one period may cause an inflationary spiral, that usually leads to an asset bubble.

In the end, when the bubble blows up, its negative effects speed up the downturn both of the real economy and the banking sector activities. Therefore, to prevent these outcomes, the regulators set forth the Countercyclical Capital buffer to ensure subject institutions have an adequate capital level, collected during credit growth periods, to build up an additional cushion to use to absorb losses in periods of financial stress.

The Countercyclical buffer rate is expressed as percentage of total RWAs and it must be set between 0% and 2.5% by the national supervisory authorities on quarterly basis.

Figure 4 shows the main characteristics and differences between Capital Conservation and Countercyclical buffers.

Capital Conservation Buffer	Countercyclical Capital Buffer
2.5% of RWA	0% - 2.5% of RWA
Fixed	Variable
Objective is to build capital buffers outside periods of stress which can be drawn down as losses are incurred	Objective is to dampen excessive credit growth in the economy to ensure capital levels in the banking sector
Non-discretionary – disclosed buffer requirements	Discretionary – buffer requirement is decided by national authorities
Pre-determined set of consequences for banks that do not meet the buffer requirements	Pre-determined set of consequences for banks that do not meet the buffer requirements similar to that of Capital Conservation Buffer
Implemented as it is and sits on top of the Common Equity Tier 1 capital requirements	Implemented as an extension to the Capital Conservation Buffer
--	National authorities pre-announce the decision to raise the buffer requirements by up to 12 months

Figure 4 - *Main features of Capital Conservation and Countercyclical Buffers (BCBS 2012)*

c) Global Systemic Institution Buffer (G-SIIs buffer) and Other Systematically Important Institutions Buffer (O-SIIs buffer)

The CRD IV regulatory framework requires G-SIIs and O-SIIs to maintain, on a consolidated level, a capital buffer (SIIs buffer) to be fulfilled only with common equity Tier 1 capital.

The rationale behind is that these institutions for their systemic importance must keep additional capital to use in case of financial instability, to prevent and reduce as much as possible the downturns on their potential failures. The buffers applied to the G-SIIs range from 1% to 3.5% of RWAs, while for the O-SIIs they can reach up the 2% of RWAs.

d) Systemic Risk Buffer

Under CRD IV framework, national authorities may introduce another additional capital buffer, the Systemic Risk buffer, to mitigate macroprudential or non-cyclical systemic risks for the real economy in a specific member state. Differently from the other capital buffers, the Systemic Risk buffer is applied to the whole financial firms and not only on individual basis. The Systemic Risk buffer must be of at least 1% of RWAs, to be met entirely with CET 1 capital. To clear up the actual levels of additional capital buffers imposed by EU national regulators, Figure 5 shows their current use in several EU countries.

Country	Counter-cyclical buffer	G-SII buffer	O-SII buffer	Systemic risk buffer	Domestic systemic buffer ¹
France	0%	1.0%-2.0%	0.25%-1.5%	none	1.5%
Germany	0%	2.0%	0.5%-1.5%	none	1.5%
Italy	0%	1.0%	0%	none	0%
Netherlands	0%	1.0%	1.0%-2.0%	3.0%	3.0%
Spain	0%	1.0%	0%-1.0%	none	1.0%
Denmark	0%	n/a	0%	1.0%-3.0%	3.0%
Norway	1.5%	n/a	2.0%	3.0%	5.0%
Sweden	1.5% ^z	1.0%	2.0%	5.0%	5.0%
UK	0%	1.0%-2.5%	tbd	0%-3.0%	3.0%

Notes: 1. The domestic systemic buffer is the higher of the O-SII and systemic risk buffer, except for Norway where the O-SII and systemic risk buffers are summed. 2. Countercyclical buffer set to rise to 2% in March 2017. Source: ESRB, Scope Ratings

Figure 5 - Additional Capital Buffers levels in different EU countries (ESRB 2016)

Figure 5 highlights that most countercyclical capital buffers have been set at 0% considering the persisting sluggish economic European environment, but above all, it is evident the great variation in the application of systemic buffers.

In fact, for systemically important institutions, there are large differences in the level of their required SII buffers across Europe and in addition, some national authorities discretionally avoided to impose them, instead using the systemic risk buffers that are much more versatile. These varying approaches suggest that, the levels of regulatory capital banks must hold can differ significantly across different jurisdictions.

1.3.3 Pillar II capital

In addition to previously described Pillar I requirements, CRD IV¹⁹ sets forth that national supervisory authorities should be empowered to require financial firms to hold additional Pillar II requirements, when there are risks or elements of risks that are not covered by Pillar I or Combined Capital buffer requirements.

To evaluate whether a bank hold a sufficient level of capital, the national supervisors carry out the Supervisory Review and Evaluation Process (SREP) and, in accordance with its results, they can impose an additional Pillar II requirement ranging from 0% to 2% of RWAs to be met entirely with CET 1 capital.

In 2016, the SREP²⁰ regulation changed and now the capital requirements that may be imposed from the SREP assessment is made up of two parts. The first one is the Pillar II requirement (P2R) which still covers underestimated and uncovered risks by Pillar I. The second one is the Pillar II guidance (P2G), which represents the sufficient capital that a bank must maintain as a buffer to withstand stressed events scenarios and sits on the top of the Combined Buffers.

While P2R is binding, P2G is not, hence if a bank violates the latter, no automatic restriction on payments distribution occurs. However, if that bank is not able to restore promptly its capital buffers, the competent authorities may decide to impose this constraint. Therefore, P2G level can be considered as the trigger point that if satisfied allows for the dividends distribution.

Figure 6 displays the current composition and order of Pillar II capital requirement.

¹⁹ European Union (2013a) *DIRECTIVE 2013/36/EU of the European Parliament and of the Council, Article 104, Official Journal of the European Union.*

²⁰ Allen and Overy (2014b) *Capital Requirements Directive IV Framework Capital Buffers.*

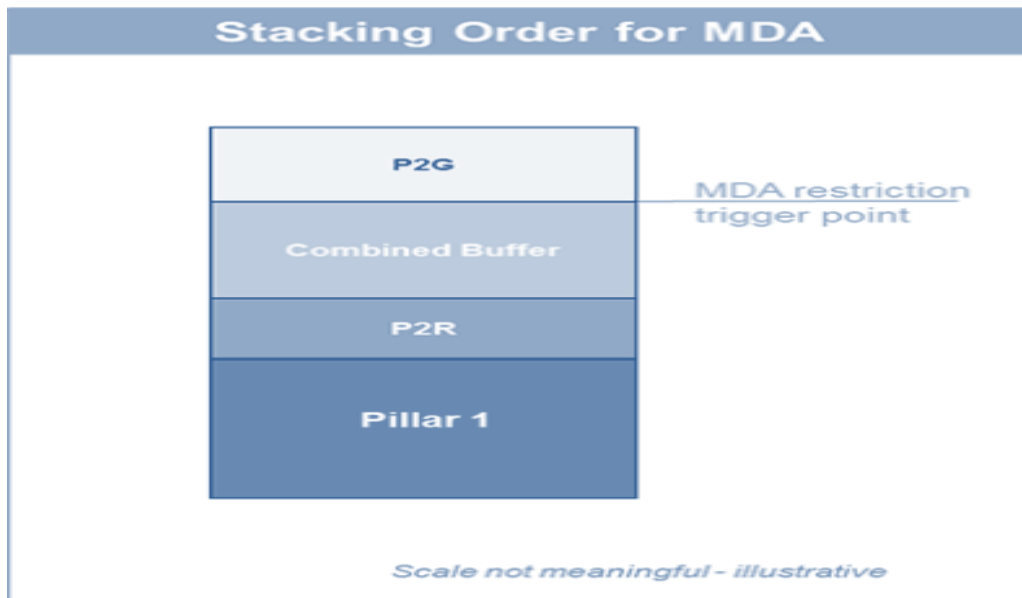


Figure 6 - SREP 2016 new Pillar II requirement composition (ECB 2016)

The previous sections describe in detail each element constituting the framework for European banks' capital structure introduced by the CRD IV – CRR regulations.

Figure 7 shows clearly the required ratios for each capital buffer as well as their phase-in schedules until full implementation in 2019.

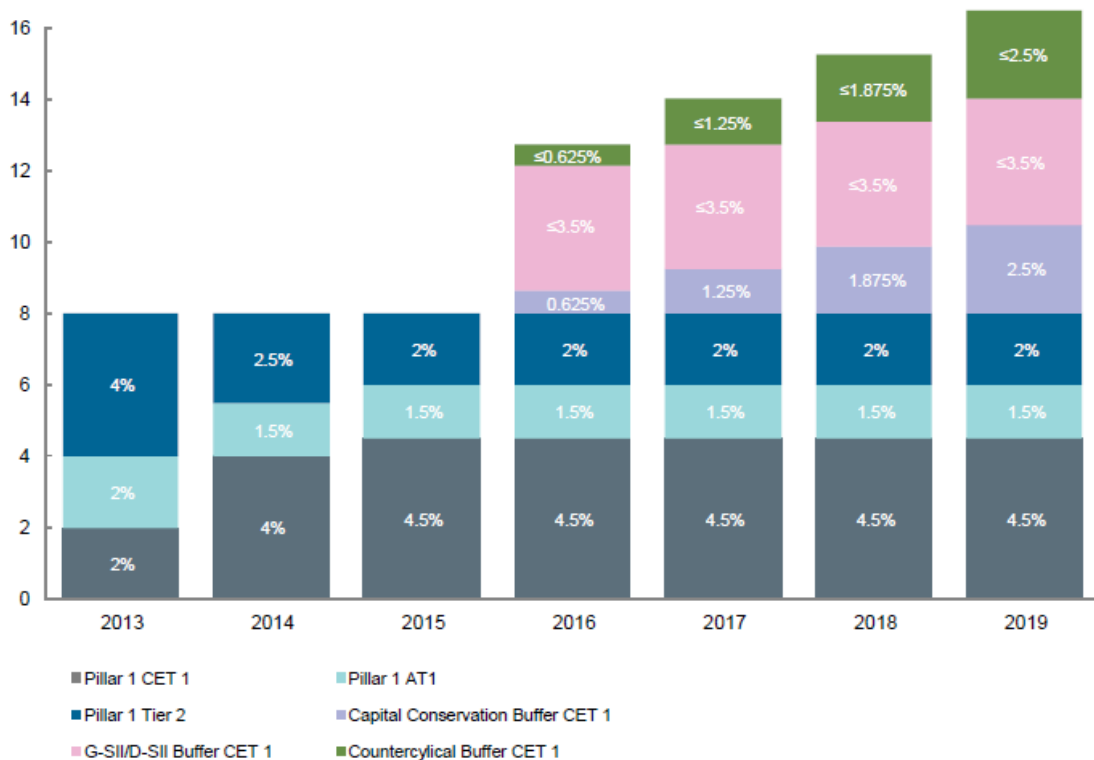


Figure 7 - Capital structure of a bank under CRD IV – CRR and phase-in provisions (CRD IV Framework and Capital Buffers, Allen & Overy 2014)

Being acquainted with capital requirements and additional regulatory buffers is essential to understand the successive international and European banking regulations.

In the end, this chapter describes the hallmarks and main causes of the current EU financial regulatory system. In fact, the European Banking Union and the CRD IV – CRR norms constitute the roots upon which the Banking Recovery and Resolution Directive (BRRD) has been built. The next chapter will discuss the BRRD in detail, placing a great focus on the “Bail-in” tool and the minimum requirement for own funds and eligible liabilities (MREL) illustration.

2 The Bank Recovery and Resolution Directive - BRRD

2.1 BRRD's rationales and objectives

The global financial crisis, begun in 2007, have left remnants that are affecting many economies still today. The crisis outbreak showed too few clarities in how handle a distressed financial sector and a severe lack of tools available to manage failing financial institutions, without suspending their ability to continue systemically critical functions to the real economy.

Since that time, both nationally and internationally competent authorities introduced new rules about bank recovery and resolution regimes, including the Dodd – Franck Act in the USA in 2010 and the Bank Recovery and Resolution Directive (BRRD)²¹ in Europe, adopted in 2014. The BRRD establishes a common scheme in recovery and resolution processes for credit institutions and investment firms, already subject to the supervisory provisions of the CRD IV – CRR framework, within the European Union.

Therefore, it applies to credit institutions and investment firms with an initial capital above 730.000 euro and to other financial holdings or subsidiaries established within the Europe Union²². In addition, the BRRD could cause indirect effects on many other entities, including European banks' branches located outside the union, even if they are not subject directly to the directive.

It is important to emphasise that, the BRRD sets forth a harmonized set of rules for banking resolution and recovery processes, but it is up to each member state to transpose it into national laws. In doing so, national authorities may insert supplementary instruments at local level on how to handle financial instability, only if they are compatible with the BRRD rules.

The main objective of BRRD regulation is to set a framework, able to assure that distressed financial institutions can be resolved with the minimum impact on overall financial stability, without affecting too severely the real economy, relying on the Bail-in²³ tool instead of a government bail-out²⁴.

²¹ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Official Journal of the European Union.*

²² European Union (2013b) *REGULATION (EU) No 575/2013 of the European Parliament and of the Council, Article 4, Official Journal of the European Union.*

²³ A bail-in takes place before a bankruptcy and under current proposals, regulators would have the power to impose losses on bondholders while leaving untouched other creditors. (Financial Times Lexicon).

²⁴ In the period 2008–2012, the total costs borne by European governments to support the financial sectors in the forms of capital injection and asset relief amounted to 600 billion €, corresponding to 4.6% of 2012 European GDP (European Commission (2014a) *Economic Review of the Financial Regulation Agenda*).

Thus, the purposes of a resolution process, as intended in the BRRD, are much wider than in regular insolvency proceedings, wherein a trustee is appointed to get rid of the bank's assets and distribute the incomes among the creditors, paving the way to instability and contagion throughout the financial system. In contrast, the resolution authorities could manage banks' distressed periods by reorganizing institutions, dividing incurred losses among creditors and at the same time preserving their critical functions²⁵ supply and access to deposits.

To deal with future banks' failures, the BRRD expects the establishment in each member state of an operationally independent institution, the so called "resolution authority", with the necessary resources and competences to manage a failure of a bank. Furthermore, the BRRD sets forth that the resolution authority should be a distinct public entity from the supervisory one, and only in the exceptional cases, the latter can be designated as a resolution authority. Nevertheless, this legal technicality became the standard, since in most EU member states the resolution authorities have been established within the supervisory ones, with the only notable exception of the Single Resolution Board (SRB) that is a clearly detached institution with respect to the ECB as supervisor²⁶.

The resolution authorities together with the supervisory ones may decide to put a financial institution into resolution if it is failing or likely to fail and at the same time they judge that, the outcomes of its regular liquidation procedure could severely threaten the system stability. To achieve the resolution goals, the BRRD confers to the resolution authorities a list of four tools called "resolution tools", which can be used on a case-by-case basis, individually or combined.

- I. The Bail-in tool grants the resolution authorities the power to cancel the value of existing shares and to write-down or covert debt instruments into new equity, to absorb the incurred losses and recapitalise the bank
- II. The sale of business tool²⁷ allows the resolution authorities to sell the totality or a part of the financial institution under resolution to a purchaser on a fair price term

²⁵ Critical functions are defined as activities, services or operations the discontinuance of which is likely in one or more Member States, to lead to the disruption of services that are essential to the real economy or to disrupt financial stability due to the size, market share, external and internal interconnectedness, complexity or cross-border activities of an institution or group, with particular regard to the substitutability of those activities, services or operations (European Union (2014) *DIRECTIVE 2014/59/EU, Article 2*).

²⁶ World Bank Group (2016c) *Understanding Bank Recovery and Resolution in the EU: A Guidebook to the BRRD*.

²⁷ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 38-39, Official Journal of the European Union*.

- III. The bridge institution tool²⁸ allows for a temporary transfer of equity and good assets to a public bridge institution, also known as “bridge bank”, that will continue the critical functions for up to two years until a private purchaser is found
- IV. The asset separation tool²⁹ allows the resolution authorities to transfer bad assets of one or more institutions under resolution, to a public owned asset management vehicle (AMV), also known as “bad bank”, created with the purposes to cater and gradually sell non-performing assets, when an immediate bank liquidation is too onerous

In addition, the BRRD does not forbid at all a public bail-out. In fact, the so called “government stabilization tools”, may apply only in exceptional cases when there is a serious threat on the financial sector and after having tried all the available resolution solutions.

To conclude, this paragraph briefly describes the background and the key elements introduced by the BRRD. Nevertheless in accordance with the purposes of this work, we will first illustrate the recovery and resolution planning as a prologue to the detailed description of the Bail-in tool and the minimum requirement for own funds and eligible liabilities (MREL).

2.2 Resolution preventive and preparatory tools

The BRRD introduces several measures and powers that have the purpose, to prevent and prepare the financial institutions to the resolution process.

To prevent the resolution when an institution is facing a period of instability, the new regulation obliges the credit institutions to draw up an internal recovery plan, wherein they describe the measures to implement to restore their normal business conditions. To complement the resolution preventing tools, the directive gives to the supervisory authorities’ additional intervention powers included in the normal supervisory activity, known as early intervention tools. If the preventing tools are unable to restore a stable condition and the resolution is unavoidable, the resolution authorities should prepare for this event by drawing up a resolution plan to implement in case of need.

After this brief introduction, the purpose of this paragraph is to provide a comprehensive description of these measures, as necessary prologue for the illustration of the Bail-in tool.

²⁸ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 40-41, Official Journal of the European Union.*

²⁹ *Article 42 (Ibid.).*

2.2.1 Prevention measures

The recovery plans³⁰ do not constitute an absolute new feature in euro-area banking system, in fact during the crisis in several countries, the supervisory authorities asked financial institutions to draw up a recovery plan still before BRRD came into force. All these plans shared a common objective: set out an array of measures to deal with a crisis at an early stage, boosting financial stability and lowering the possible drawbacks on the economy and contagion effects.

The BRRD considers the recovery plans as key elements into the supervisory process, since they provide useful insights of banks' conditions to the authorities and serve jointly as preparative and preventive tools for the firm themselves, also in not stressed business periods. The banks develop and maintain the recovery plan, which contains a description of how they monitor the business developments and how they can pre-empt stressed periods that may threaten stable capital and liquidity positions. To do so, recovery plans must define some suitable recovery options under different scenarios of financial stress, and specify in detail the distribution of roles and responsibilities in crisis management.

In addition, the credit institutions must identify an adequate set of early warnings signals, quantitative indicators and determine "easy to hit" levels, that act as trigger points.

In 2015, the EBA guidelines specified a list of minimum indicators classes to be inserted inside recovery plans: capital, liquidity, profitability and asset quality indicators and additionally market-based and macroeconomic indicators³¹. Triggering the "easy to hit" levels leads to a stricter monitoring phase but does not impose the automatic implementation of recovery options.

The recovery plans must be drawn up on a consolidated basis, in fact the parent company is obliged to deliver a group comprehensive plan to the consolidating supervisors³². Moreover, cross-border institutions should deliver more plans to different EU national supervisors, to allow and facilitate the coordination among different authorities.

In the end, the recovery plan must be approved by the senior management that is appointed to submit it to supervisory authorities too. These latter must evaluate it and determine, if it is adequate to restore swiftly and effectively the bank's financial soundness after a stress event. Whether the plan is judged unsuitable, the institution must deliver an amended version later.

³⁰ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 5-9, Official Journal of the European Union.*

³¹ European Banking Authority (2015c) *Guidelines on the minimum list of qualitative and quantitative recovery plan indicators*

³² *Article 8 (Ibid.).*

Together with recovery plans, serving as preventive measures in case of a period of financial distress, the BRRD enhances the probability to avoid a bank crisis providing the supervisors with additional intervention powers, known as the early intervention measures.

The early intervention measures³³ constitute an effective toolset, that BRRD provides only to supervisory authorities, to tackle at an early stage any form of bank's crisis or distress period that may threaten its stability. As early intervention tools, the supervisor may require institution's management to implement the arrangements set out in the recovery plan. If actions under the bank's recovery plan are insufficient to tackle the deteriorated financial condition, the supervisors can request changes to the bank's business strategy, its legal and operational structure or debt restructuring.

Broadly speaking, any infringement to the minimum capital requirements or any bank's indicators showing a deteriorating financial condition may lead to early intervention measures. To promote a consistent application of early intervention tools among member states and to integrate these norms with the Supervisory Review and Evaluation Process (SREP), the EBA published its own Guidelines³⁴ on the circumstances under which early intervention measures apply. The Guidelines did not specify any threshold, that can be perceived as a new capital or liquidity requirement, but linked the early intervention measures triggers to the overall outcomes of SREP assessment.³⁵The SREP scores range from 1 (no discernible risk) to 4 (high risk) and the competent supervisory authorities may decide to implement early intervention measures when the overall SREP score is 3 or 4³⁶.

Nevertheless, the breach of any early intervention tools triggers, as for the recovery plan indicators, does not result in their automatic implementation. However it suggests that the supervisory authorities should carry out further investigations why the triggers have been breached and decide whether to apply their powers or not.

³³ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 28-30, Official Journal of the European Union.*

³⁴ European Banking Authority (2015) *Guidelines on triggers for use of early intervention measures pursuant to Article 27(4) of Directive 2014/59/EU.*

³⁵ European Banking Authority (2014) *Guidelines on common procedures and methodologies for the supervisory review and evaluation process (SREP).*

³⁶ The overall score of SREP on a bank is determined by the individual grades of six elements: the business model and strategy, the internal governance and institution-wide controls, capital and liquidity risks degrees, capital and liquidity adequacy (*Ibid.*).

2.2.2 Preparatory measures

The BRRD sets out that the resolution authorities must draw up resolutions plans³⁷ for institutions under their jurisdiction, to be prepared in case of future crises, assessing the systemic importance of the banks as well as the possible consequences of their failures. In fact, the authorities after having collected enough information about the capital and liabilities profiles of the institution, may begin to draw up the plan assessing in first stage the feasibility and credibility of a liquidation under normal insolvency procedure.

The BRRD did not cancel the insolvency procedures, in fact in case of failure of institutions considered too few significant, the resolutions tools are not available, meaning that in these cases regular insolvency proceedings apply and the resolution authorities should draw up a simplified resolution plan. Instead, if an institution's failure is considered dangerous for the financial system stability and it may cause a contagion effect, the resolution tools apply, and the authorities must draft a full-strength plan.

A resolution plan should contain several information about the resolution strategy or the combination of tools chosen to handle the bank crisis, a resolvability assessment and the types of financing sources needed to carry on the resolution process.

As said above, the resolution authorities must describe the preferred resolution strategy as well as the tools and powers required to implement it, considering the bank's operational framework, number of subsidiaries, business model and the capital and debt characteristics. Although it is not explicitly stipulated in the BRRD, according to the guidelines set forth by the Financial Stability Board for G-SIIs³⁸, the resolution strategies should follow two distinct approaches: "single point of entry resolution" (SPE) or "multiple point of entry resolution" (MPE). In the first the resolution tools and powers, such as the bail-in or transfer tools, apply exclusively on the parent or holding company. As an example, in this case the absorption of losses incurred by the group occurs through the equity write down or instruments' conversion into capital, only at the top level of the group. In fact, only if the parent company has not enough resources to absorb losses, the subsidiaries could be put into a resolution process.

In the second approach multiple resolution authorities have the power to apply the resolution tools to different part of the financial group, dividing it into separate parts depending on their national jurisdiction or business line.

³⁷ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 10-14, Official Journal of the European Union.*

³⁸ Financial Stability Board (2013) *Recovery and Resolution Planning for Systemically Important Financial Institutions: Guidance on Developing Effective Resolution Strategies.*

Since the resolution authorities may decide to apply different tools to the different parts, the multiple point of entry approach requires a high degree of coordination among authorities to reduce possible inconsistencies among their policies.

The resolvability assessment³⁹ represents the second stage of the resolution planning process, in fact through this analysis the supervisors may evaluate the feasibility and credibility of the resolution strategy on a specific institution. To ensure the feasibility of a resolution process and to eliminate the barriers to its effective implementation, the BRRD provides the resolution authorities with very intrusive and far-reaching powers allowing them to intervene outside of any prudential supervisory indicators and requirements. These measures include the power to restructure the organizational and legal structure of an institution, to impose the restriction or diversification of activities as well as the restructuring of liabilities.

In the end, the directive did not provide a strict timeline to implement the resolution planning of a bank. Therefore, it could take a long time to have the first resolution plan of a European bank. This fact may hinder the current ability of the Single Resolution Board to intervene timely to deal with a failing institution, since it should select the adequate resolution procedure to propose to the European Commission relying on a pre-existent plan.

2.3 The Bail-In tool

The Bail-in represents the most innovative resolution tool introduced by the BRRD, to apply when an institution is deemed failing or likely to fail.

Under the Bail-in, the resolution authorities may write off existing shareholders' equity and write down and / or convert into new shares the principal amount of unsecured debt instruments, to absorb losses and recapitalize a failing financial firm without the need of a public rescue.

Depending on the choices of the resolution authorities on how carry out the resolution process and what combination of tools utilize, the bail-in tool could be used for different purposes. If used alone, the most important goal of a bail-in should be recapitalize the firm through shares value cancellation and the write down and / or conversion of unsecured instruments, up to an amount necessary to fully absorb losses and to restore the institution's minimum capital requirements level.

³⁹ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 15-18, Official Journal of the European Union.*

Instead, if used in combination with other tools, the bail-in could serve as a preparatory item to absorb losses and partially recapitalize the firm, that will be later transferred to a bridge institution provided with some capital or sold to a private purchaser⁴⁰.

The BRRD sets out that all the liabilities could be included into a bail-in procedure, except for those it expressly excludes and those that under unique circumstances, may be wholly or partially excluded from the competent resolution authority, to assure that a bank can continue its critical functions or prevent contagion effects. The most noticeable exception from bail-in-able instruments are deposits and secured liabilities, that enjoy a partial dispensation. In fact, any amount of deposits that is not covered by any Deposit Guarantee Scheme⁴¹ could be theoretically bailed-in. Instead secured liabilities are not subject to a bail-in, up to the amount of the collateral securing the instruments. Hence if the value of the liability exceeds the collateral's one, the remaining part could be potentially bail-in-able too.

Whereas a resolution authority decides to exempt certain liabilities from a bail-in, it may decide to apply a higher rate of conversion or write down on other eligible instruments, provided that this action does not breach the “no creditor worse off than under liquidation” (NCWOL)⁴² principle. This latter represents a binding constraint to carry out a resolution process, stating that the shareholders and creditors do not have to bear higher losses during a resolution than under normal insolvency proceedings.

To provide a better view of the bail-in tool, Figure 8 shows a theoretical application of the Bail-in process in its stages.

⁴⁰ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Article 8, Official Journal of the European Union.*

⁴¹ Deposit guarantee schemes (DGS) reimburse a limited amount to compensate depositors whose bank failed. Under EU rules, deposit guarantee schemes protect depositors' savings by guaranteeing deposits of up to €100,000 and help prevent the mass withdrawal of deposits in the case of bank failure, which can create financial instability (*Ibid.*).

⁴² European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 73-74, Official Journal of the European Union.*

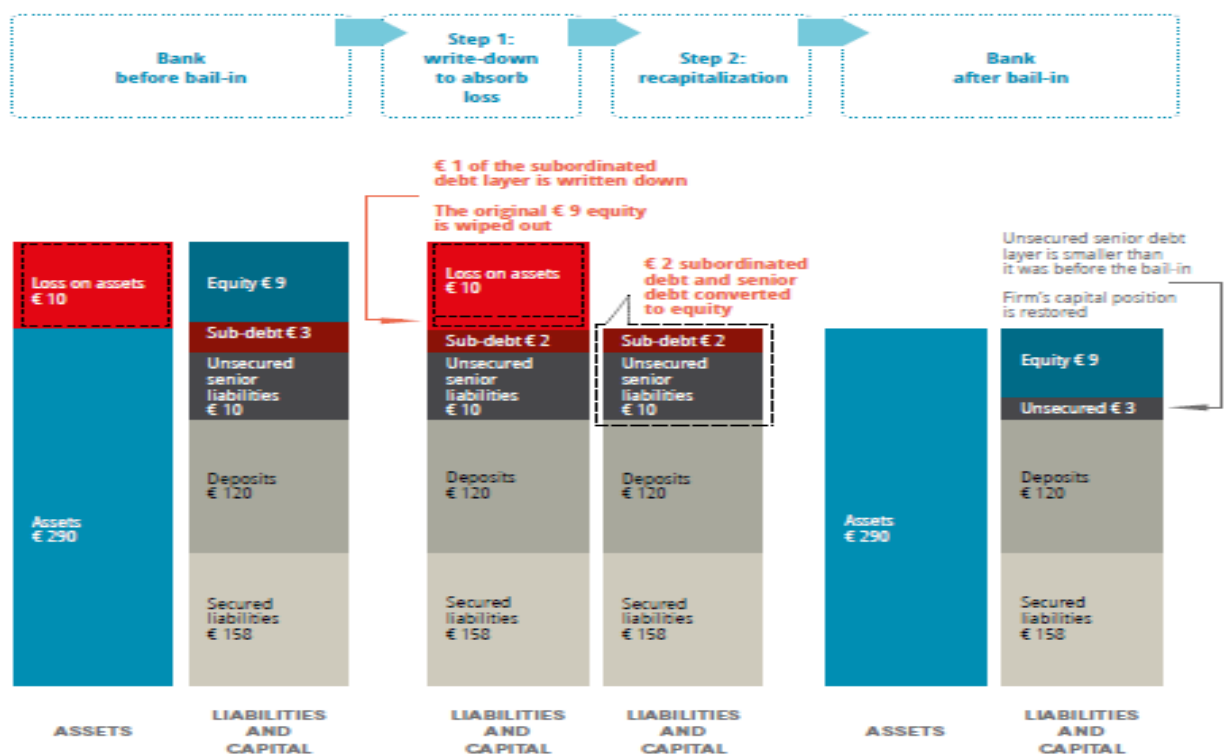


Figure 8 - Example of loss absorption and recapitalization in a bail-in (Word Bank Group 2016)

Figure 8 shows a very simplified case of bail-in application on a distressed bank, nevertheless it helps to highlight the key elements of a resolution process applied via a bail-in.

In fact, in example the bank suffered severe losses on the asset side that are first absorbed through the existent equity and some subordinated debt write off, then followed by its recapitalization through the conversion into equity of subordinated and senior liabilities up to an amount needed to restore the initial capital levels.

In addition, the BRRD sets out that the amount of losses not absorbed by the instruments excluded from a bail-in according to any discretionary authorities' choices, could be transferred to the Single Resolution Fund (SRF) or enjoy public support. In fact, the external entities may contribute to absorb losses and / or recapitalize the firm, preventing other creditors to be fully hit by authorities' decisions. Their intervention is subject to a minimum application of bail-in not below the 8% of total liabilities of the institution, meaning that the distressed bank unlocks external support only when its own funds, capital instruments and eligible liabilities have together already absorbed losses of at least 8 % of institution total liabilities.

Therefore, the threshold of 8% of total liabilities represents the minimum requested level of involvement in a bail-in process to the bank's shareholders and creditors, to safeguard broader public interests and prevent a sovereign bail-out.

In the end, the trigger point for external support in a bail-in is expressed as a ratio of total liabilities, while the totality of the CRR requirements express in comparison with the amount of risk weighted assets. This normative discrepancy may determine that the same institutions, considered resilient under CRD IV – CRR framework, have not enough own resources to withstand a bail-in being potentially subject to the write down of safer instruments such as senior debt.

2.3.1 Instruments' hierarchy under Bail-In

Once determined the level of eligible liabilities subject to a bail-in, the BRRD set outs the order and hierarchy to absorb losses and recapitalize a bank.

As said before, the shareholders bear the first losses, thereafter it is up to the creditors according to the seniority⁴³ of the instrument they hold following the hierarchy order set in national insolvency laws. To be clearer, the regulatory capital instruments Common Equity Tier 1, Additional Tier 1 and Tier 2 instruments will be wiped out or converted first, followed by all the other subordinated instruments and in the end the senior unsecured bail-in-able liabilities⁴⁴. It is important to notice, that under the bail-in procedure, the value of equity may be altered by accounting losses, whilst the amount of AT1 and Tier 2 capitals composed mainly by debt instruments, would preserve their book values during the resolution. This represents a good reason for a bank to issue subordinated instruments more and more in the future in addition to equity.

In addition to the Bail-in, the BRRD empowers the resolution authorities with the Write-down or Conversion of Capital (WDCC)⁴⁵ instruments tool that may be considered a milder version of a full-strength bail-in. In fact, it can be applied whereas the institution suffered losses, but there are enough capital instruments (CET1, AT1 and Tier 2) to absorb them or to be converted into equity and there is still not a noticeable threat for the overall financial stability.

Therefore, the WDCC measures can be thought as a prelude to bail-in if they fail to restore stable business conditions.

⁴³ Seniority refers to the order of repayment in the event of a sale or bankruptcy of the issuer. Seniority can refer to either debt or preferred stock. Senior debt must be repaid before subordinated (or junior) debt is repaid. Each security, either debt or equity, that a company issues has a specific seniority or ranking. Bonds that have the same seniority in a company's capital structure are described as being *pari passu* (Financial Times Lexicon).

⁴⁴ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 48, Official Journal of the European Union.*

⁴⁵ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 59, Official Journal of the European Union.*

In the end, the transposition into national laws of the BRRD resulted, in an already heterogeneous environment of insolvency regulations, in several different regulators approaches. The most important are the set-up of banking holding in United Kingdom, the introduction of new debt instruments in France and Spain and the amendments of insolvency law in Germany. In accordance with the purposes of this dissertation, it is interesting to describe the newly introduced debt instruments, their main features and where they position in the hierarchy of bail-in-able securities.

In France the government introduced, in the new regulation on transparency, anti-corruption and modernization of the economy (Sapin II Law)⁴⁶ entered into force in January 2017, the distinction between two different categories of senior instruments: the senior preferred and senior non-preferred notes. In fact, in the future French financial institutions will be allowed, to issue senior non-preferred notes that will serve as a cushion between their subordinated instruments and the old senior instruments and deposits in case of a bail-in. Under French law, these new instruments must have a minimum maturity of one year, they must not be structured products and above all, they shall rank junior to any other unsubordinated liability and senior to any subordinated obligation issued by the bank, during a liquidation proceeding. Moreover, senior non-preferred notes will not qualify as regulatory capital, however they would certainly be included among the eligible liabilities for Bail-in and MREL. In Spain, the national government introduced a new category of debt securities, known as Tier 3⁴⁷ instruments, that share the same characteristics and purposes of French senior non-preferred instruments.

Figure 9 shows the hierarchy of bail-in-able instruments with the new securities.

⁴⁶ Linklaters (2016) *Senior Non - Preferred Notes French law aspects*.

⁴⁷ Associazione Italiana degli Analisti e Consulenti Finanziari (2017) *BRRD e Bail-in Implicazioni per l'analisi del settore finanziario e la tutela dell'Investitore*.

Secured claims	for example, covered bonds and covered deposits (i.e. deposits up to EUR 100,000)
Unsecured deposits of SMEs and natural persons	according to Art. 108 BRRD
Preferred senior liabilities	existing senior unsecured debt, derivatives and bank and wholesale deposits
Non-preferred senior liabilities	new senior non-preferred in France and Spain, senior resolution notes in Denmark
Subordinated debt	
Regulatory own funds (CET1, AT1 and T2)	

Figure 9 - Bail-in instruments hierarchy (UniCredit 2016)

2.4 Minimum Requirement for Own Funds and Eligible Liabilities (MREL)

2.4.1 MREL characteristics

The BRRD introduced the minimum requirement for own funds and eligible liabilities (MREL)⁴⁸ as a new regulatory ratio. It is able to ensure that a credit institution holds always enough resources to be effectively bailed-in, allowing an orderly resolution process without triggering a contagion effect in the financial sector and the need of a sovereign bail-out.

The BRRD provides that every institution within the European Union, starting from January 2016 is subject to meet the MREL, nevertheless it did not set a homogeneous minimum MREL level or a quantitative ratio to comply with. In fact, the requirement's setting is delivered to the national resolution authorities, that are appointed to specify the level of required MREL for each institution under their jurisdiction as a part of the resolution strategy, set forth in the resolution plan.

As for the MREL quantitative level, the BRRD did not provide a strict timeline for its implementation. However it encourages the resolution authorities to set provisional MREL levels to allow the subject institutions to restructure their liabilities, smoothing this process over time until the final requirements will be determined⁴⁹.

⁴⁸ European Union (2014) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Articles 45, Official Journal of the European Union.*

⁴⁹ Single Resolution Board (2017) *MREL: Approach taken in 2016 and next steps.*

The MREL is expressed as a percentage of total liabilities and own funds (TLOF) of the institution, while the numerator is made up of a sub-set of instruments eligible for the Bail-in. In fact, the MREL should consist of all the liabilities that could be bailed-in swiftly with the minimum legal and operational risk. Therefore, the BRRD set specific criteria for debt securities to qualify as MREL-eligible and to separate them from the broader category of bail-in-able ones:

- ✓ The instrument is issued and fully paid
- ✓ The liability has a remaining maturity of more than one year
- ✓ The liability does not arise from a derivative
- ✓ The liability does not arise from a covered deposit guaranteed by EU national DGSS
- ✓ The liability is not secured or guaranteed by the institution itself

Furthermore, the BRRD completes the rules about MREL eligibility criteria, including the power for the resolution authorities to exclude bank's senior debt to be counted for MREL purposes if it accounts for less than 90% of the total liabilities with the same seniority and in addition including norms on the "Third Country MREL". In fact, the liabilities governed by the law of another EU member state are automatically MREL eligible. Instead if the debt instruments are governed by a non-EU law (Third Country), regularly do not count as MREL, unless the institution succeeds to demonstrate that the liabilities in question can be legally and effectively bailed-in upon resolution, also under the law of the third country.

As said before, the MREL will be set on a case-by-case basis by the competent resolution authority, applying relatively large discretionary powers. Its choice will depend upon the key elements set out in the bank resolution plan, such as multiple point of entry (MPE) or single point of entry (SPE) strategies and the resolvability assessments. Nevertheless from 2015 onwards, the EBA and the SRB published several reports and guidelines targeted to EU national resolution authorities, describing the main features upon which the requirement should be set. The initial framework about MREL requirements determination has been published in January 2016 by the Single Resolution Board⁵⁰, the supervisory authority responsible for MREL setting, based on the previous EBA "Regulatory Technical Standard"⁵¹ report.

⁵⁰ Single Resolution Board (2016) *SRB Approach to MREL in 2016*.

⁵¹ European Banking Authority (2015) *EBA FINAL draft Regulatory Technical Standards on criteria for determining the minimum requirement for own funds and eligible liabilities under Directive 2014/59/EU*.

Figure 10 shows the initial MREL framework.

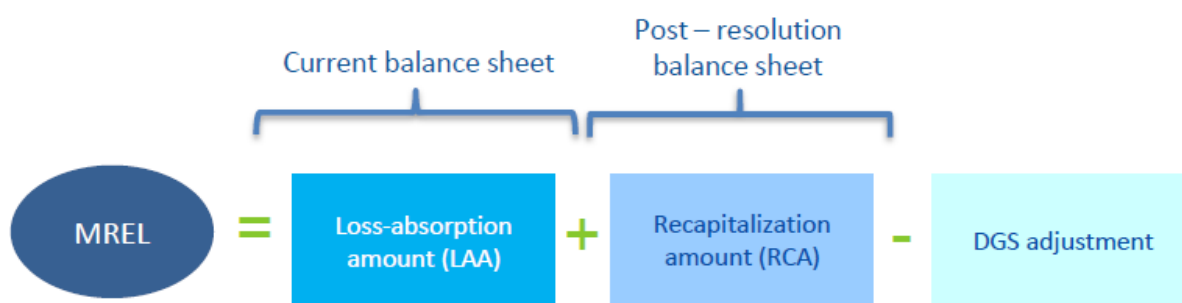


Figure 10 - *Setting of MREL requirements (Economic Governance Support Unit 2016)*

The MREL is to be calculated on three components:

- I. the loss absorption amount (LAA), composed by the prudential capital requirements including the combined buffer and the additional pillar 2 requirements, set by the national supervisory authority. However, the resolution authorities may decide in exceptional case, to exclude some capital instrument considered inadequate for LAA purposes. Nevertheless, as a baseline the loss-absorption amount should be composed by the same regulatory instruments: CET1, AT1 and Tier 2 capitals. In addition, for the banks judged suitable for liquidation rather than resolution, since they do not need resources to be potentially recapitalized, the LAA will constitute the only part of MREL. Hence, for these institutions the MREL should correspond to the prudential capital requirement.
- II. the recapitalisation amount (RCA), which aims to restore the capital requirement levels of the failing institution after the resolution process (minimum 8% of risk weighted assets). The RCA's amount should be set in accordance with the size and importance of the bank.
- III. the Deposit Guarantee Scheme adjustment, linked to any potential involvement of a guarantee scheme to protect insured depositors, that would lower the MREL requirement.

The last Single Resolution Board policy paper⁵², released in February 2017, upgraded this initial framework introducing the Informative MREL.

⁵² Single Resolution Board (2017) *MREL: Approach taken in 2016 and next steps*.

The SRB decided to introduce a new temporary MREL framework, given that a final common methodology on how setting this requirement proved to be an impossible task to achieve in 2016, given that each national resolution authority has wide discretionary powers on how to determine it. These characteristics make, for the time being, the MREL more similar to a Pillar II requirement rather than a uniform European regulatory standard.

Therefore, the SRB introduced the temporary Informative MREL as a standard target for at least the major EU banking groups that are subject to a bail-in strategy in resolution. It aims to enable these banks to prepare for their future MREL requirements that will be implemented and assigned materially in late 2017 or more probably in 2018.

The Informative MREL target as the previous approach is composed by the Loss Absorption Amount (LAA), the Recapitalization Amount (RCA) and the Market Confidence Charge (MCC) that replaces the original DGS adjustment. It represents the amount necessary for the resolved institution to be sufficiently sure to not breach another time the level of capital requirements restored after the recapitalization, if some further losses occur. The SRB provides that a level of MCC equal to the combined capital buffers minus 125 basis points should be enough to ensure post-resolution market confidence⁵³.

In addition, the SRB suggests the national resolution authorities to consider, in the setting process of the MREs for the major banking group, a requirement level at least equal to the 8% of their total liabilities and own funds. This means that every important banking group should be always able to face a bail-in by itself, until a point sufficient if necessary, to access to external government support.

In the end, this paragraph describes the main MREL purposes, instruments eligibility criteria and a brief evolution of the approaches about its levels setting. Nevertheless to highlight and discuss the shortcomings and the contradictory points of the current regulation, it is worth to compare it with the FSB Total Loss Absorbing Capacity (TLAC) standard and to describe its state of play in the United Kingdom and Sweden that drafted a set of rules on MREL application.

⁵³ Single Resolution Board (2017) *MREL: Approach taken in 2016 and next steps*.

2.4.2 MREL and TLAC relationship

In November 2015 the Financial Stability Board (FSB) introduced a new regulatory standard the Total Loss-Absorption Capacity (TLAC)⁵⁴ addressed to all the Global Systemically Important Banks (G-SIBs). It is defined as the minimum amount of equity and specific liabilities the systemic important institutions need, to absorb losses and recapitalize during an orderly resolution process to minimize the negative spillovers on the real economy. The TLAC, as the previous supervisory frameworks developed by the Basel Committee on Banking Supervision (BCBS) is not a binding requirement, hence it must be transposed into national as well as European laws.

Even though the MREL and TLAC share the same purposes they have significant differences. First of all, the scope of TLAC is limited to G-SIBs, whilst the MREL addresses to all the European banks. Moreover the FSB already set out the TLAC term sheet as well as its suggested level, in fact the GSIBs will have to comply with a minimum TLAC level of 16% of RWAs in 2019 and from 2022 the minimum threshold will be set at 18% of RWAs.

In addition, the TLAC standard sets out specific rules about the treatment of banks' CET1 capital in its fulfilment, the so called "Stacking order of CET1 buffers"⁵⁵. Indeed, within the FSB framework, the CET1 regulatory capital must not be counted simultaneously to meet the TLAC requirement and the combined capital buffers. This provision means that the CET1 capital should be first used to meet the TLAC level and then to fulfil the additional buffers. Hence, if a bank has not enough TLAC eligible debt can use its CET1 stacked in the buffers to fill the gap in the TLAC.

On the contrary, the BRRD allows the CET1 capital to be double counted both for MREL and additional capital buffers fulfilment, however this rule may hinder the effectiveness of the additional buffers. As an example, if the supervisors set a lower level of countercyclical buffer allowing the bank to hold less CET1 capital to boost its activities, this action may cause the breach of its own MREL requirement since the released CET1 is not more qualifiable as regulatory capital.

⁵⁴ Financial Stability Board (2015) *Principles on Loss-absorbing and Recapitalisation Capacity of G-SIBs in Resolution*.

⁵⁵ (*Ibid.*)

In the end, the most important difference between the two requirements is the degree of subordination of eligible instruments. In fact, the TLAC standard sets out that eligible instruments must be subordinated to any excluded liability⁵⁶.

This provision reduces the legal risks associated with the bail-in of senior liabilities that have by law the same rank of TLAC excluded instruments, such as covered bonds and derivatives. Therefore, to ensure that the TLAC instruments can absorb losses before excluded liabilities, allowing for an eased resolution process and to safeguard the “no creditor worst off” principle, the FSB foresees three kinds of instruments’ subordination⁵⁷:

- ✓ Contractual subordination: The debt contract explicitly sets out the degree of subordination of the security
- ✓ Statutory subordination: The national insolvency regulation determines the subordination hierarchy of debt instruments
- ✓ Structural subordination: The structure of the banking group determines the internal subordination hierarchy of debt instruments

Conversely, the BRRD does not provide any mandatory subordination for the liabilities eligible to be counted into the MREL. However it empowers the national resolution authorities to decide on a case-by-case basis, whether a certain institution should restructure its debt to meet the MREL only with subordinated instruments.

In the end, the TLAC standard constitutes a benchmark for European further supervisory regulations. As suggested by the last EBA guidelines⁵⁸, the MREL rules will be progressively reviewed in the next future to align the minimum requirement to the FSB standard.

The reasons behind the possible amendments in the MREL regulation will be discussed in section 2.4.4, after recalling the approaches already adopted by the competent authorities in United Kingdom and Sweden.

⁵⁶ TLAC excluded liabilities include insured and short-term deposits, liabilities with less than one-year maturity, liabilities arising from derivatives, secured senior liabilities and any liability which cannot be bailed-in without giving rise to material risk of successful legal challenge or valid compensation claims (European Parliament (2016) *Loss absorbing capacity in the Banking Union: TLAC implementation and MREL review*).

⁵⁷ Financial Stability Board (2015) *Principles on Loss-absorbing and Recapitalisation Capacity of G-SIBs in Resolution*.

⁵⁸ European Banking Authority (2015) *EBA FINAL draft Regulatory Technical Standards on criteria for determining the minimum requirement for own funds and eligible liabilities under Directive 2014/59/EU*.

2.4.3 MREL state of play in UK and Sweden

The United Kingdom and Sweden are the only two EU countries, where up to now, the competent resolution authorities have identified an approach in MREL setting for their own domestic banks. In UK, the Bank of England (BoE) published its first proposed policy on MREL setting for UK banking groups in December 2015, followed by its final policy report⁵⁹ published a year later.

The approach carried out by the Bank of England is to align the MREL regulation to the FSB's TLAC standards, aiming at least for systemically important banks to implement the TLAC standard using the MREL requirement. To further integrate the two disciplines, the Bank of England have set a transitional phase-in period for the MREL until its fully implementation in 2022 and it forbade the double counting of CET1 to meet simultaneously the MREL and the combined buffers.

The Bank of England expects that the institutions, that are subject to a Bail-in resolution strategy, can meet a MREL level equal to the double of Pillar 1 and Pillar 2 requirements with the capital buffers on the top, meaning that the capital buffers must be met in addition to MREL levels. Furthermore, the BoE identifies that the MREL eligible instruments should be contractually or structurally, this latter is the preferred approach, subordinated to the operational liabilities⁶⁰, allowing the alignment of instruments' hierarchy under resolution and insolvency procedures.

In structural subordination, the debt securities hierarchy is linked to the structure of the group. In fact, the operating entities (OpCos) within a group exercise the critical banking functions and issue MREL eligible liabilities, the so called "Internal MREL", to the holding company (HoCo). This latter does not exercise an operational key role, but serves as a basket of intra-group resources and it is appointed to issue MREL eligible liabilities, called "External MREL", to external investors.

When losses arise in the operating entity, the equity and liabilities held by the holding company should be written down or converted. If the losses are too severe, the holding company is put under resolution and its externally issued MREL liabilities serve to recapitalize. This approach safeguards the operating companies' supply of critical functions and simplify the resolution of large and complex banks.

⁵⁹ Bank of England (2016a) *The Bank of England's approach to setting a minimum requirement for own funds and eligible liabilities (MREL) Responses to Consultation and Statement of Policy.*

⁶⁰ Wholesale deposits and derivatives (*Ibid.*).

Figure 11 shows the difference between Internal and External MREL in structural subordination implemented by the Bank of England.

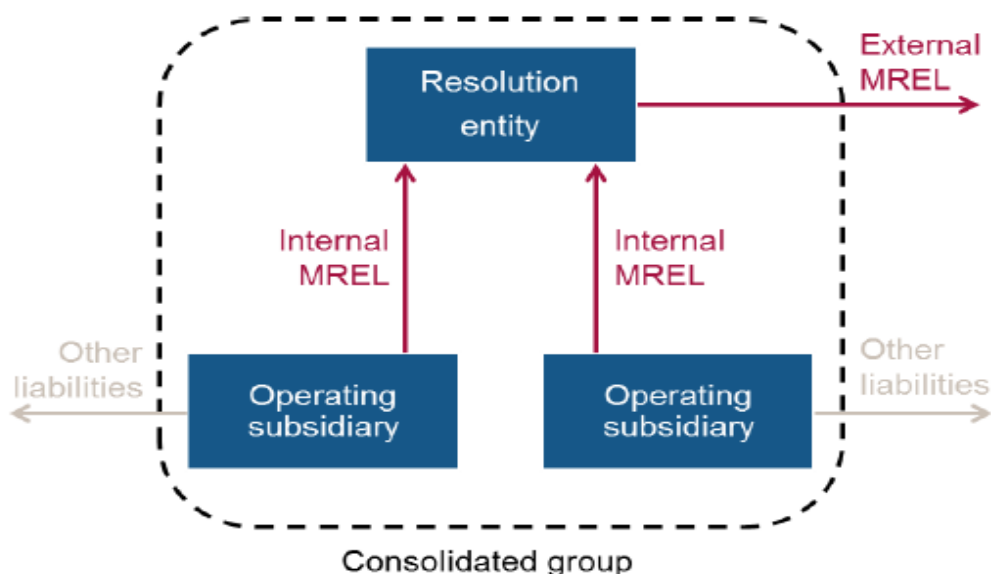


Figure 11 - *Internal and External MREL in UK (Bank of England 2015)*

In Sweden, the competent national resolution authority, the Swedish National Debt Office (SNDO) published in February 2017, its final decision memorandum⁶¹ on MREL application addressed to Swedish banks.

As the Bank of England, the Swedish authority has set a quantitative minimum MREL for systemically important banks to implement following the TLAC standard term sheet. Moreover it encourages EU member states to harmonize insolvency regulations by establishing a common intermediate category of liabilities, as France and Spain did, between the regulatory capital Tier 2 and the most senior debts.

With regard to the calibration of MREL levels, the Swedish approach is slightly different compared to the BoE and SRB ones. In fact, the SNDO excludes the combined capital buffer of an institution to determine its level of MREL requirement and it provides that the recapitalization amount should be composed only by MREL instruments, clearly separating the purposes of the equity and the eligible liabilities inside a bail-in process.

In fact, the own funds should be used only to absorb losses, while to recapitalize the institutions should not rely heavily on the remaining capital, since its value may be seriously reduced throughout a resolution. Hence the bank should at least hold an amount of eligible debt securities sufficient to recapitalize themselves.

⁶¹ Swedish National Debt Office (2017) *Decision memorandum Application of the minimum requirement for own funds and eligible liabilities*.

In the end, the SNDO sets out that the MREL must be fulfilled by Swedish bank only with subordinated instruments not later than 2022. Although the SNDO allows for all the three kinds of instruments' subordination, it recognizes that a structural or statutory subordination are unlikely to be implemented today in Sweden, since they would require major reforms in insolvency law and in the structure of banking groups.

Therefore, it envisages the issuance of new contractually subordinated liabilities, as the only viable method for the national banks to meet the MREL requirements in the next future.

2.4.4 Future developments in MREL regulation

It is a matter of fact that, the European banking regulatory framework is a complex system composed at the same time, by sovereign authorities setting rules and providing guidelines on their application and national entities that have discretionary powers on how transpose them into local regulations. This heterogeneous environment of sovereign and national laws is additionally complicated by the relationship with the international supervisory standards, that although not binding, form a set of rules that European legislators have to consider in their choices. Due to all these reasons, the key role of the European supervisory authorities is to promote a harmonization of member states' banking regulations and to align the European norms to the international standards to prevent an unwarranted legal complexity.

One of the key element introduced by the BRRD, the minimum requirement for own funds and eligible liabilities should have been fully implemented from January 2016, nevertheless it did not happen. In fact, although the EBA and the SRB provided guidelines and technical standards on its implementation, only two-member states have set provisional arrangements on its application addressed to local banks. These evidences provide a hint, on how far we are from the fully application of the MREL and how the national supervisors are replying to an overabundant and confused regulation.

The European authorities already conceived that a substantial review of the MREL regulation should be done, suggesting several amendments included in the EBA recommendations⁶² and in the European Commission proposal of banking reforms⁶³, known as the "Banking Package", both published in the late 2016.

⁶² European Banking Authority (2015) *EBA FINAL draft Regulatory Technical Standards on criteria for determining the minimum requirement for own funds and eligible liabilities under Directive 2014/59/EU*.

⁶³ European Commission (2016c) *Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013*.

The overriding element to review is the need to ensure the consistency of the MREL with the international standards, through the incorporation of the TLAC standard into the MREL to avoid the potentially parallel application of two rules that share the same purpose.

Therefore, the features to update are the reference base of the MREL that should be changed from the TLOF⁶⁴ to the RWAs and the rules on how to handle the CET1 capital to fulfil the MREL requirement. Above all, under the future revised framework, all the systemically important banks within the Union should meet their MREL levels with subordinated liabilities, in accordance with the TLAC term sheet.

The reason behind the subordination requirement for MREL eligible liabilities is to ensure the real viability of the Bail-in tool and to reduce the possibility that some creditors would bear more losses under resolution than in insolvency, breaching the “NCWOL” principle. To clarify this point, a Bail-in process can succeed only if the failing bank is able, in the meanwhile, to continue its activities. Hence at least its operational liabilities⁶⁵ should be excluded from this process. To overcome this issue, the current rules already allow the resolution authorities to exclude these liabilities to be used for a bail-in. Nevertheless doing so, they would automatically impose a higher percentage of losses to other creditors that hold instruments with the same seniority rank.

Therefore, the EBA envisages the MREL instruments subordination however is accomplished, as a key element assuring that the Bail-in of major institution under resolution will become a viable tool. This view is restated and complemented by the EU Commission amendment proposal of the current regulation, in which it firmly suggests that something must be done to reform and harmonize European member states insolvency laws.

These reforms should aim to align the treatment of the creditors in resolution and insolvency, through different methods: the creation of a new sub-class of senior creditors as in France and Spain, the subordination by law of the senior debtholders to depositors and derivatives counterparties⁶⁶ as in Germany or allowing the banking groups to reorganize their structure in form of holding companies as in the United Kingdom.

⁶⁴ Total amount of liabilities and own funds (Financial Times Lexicon).

⁶⁵ The Financial Stability Board identifies as operational liabilities the derivatives instruments and wholesale deposits (Financial Stability Board (2015) *Principles on Loss-absorbing and Recapitalisation Capacity of G-SIBs in Resolution*).

⁶⁶ Associazione Italiana degli Analisti e Consulenti Finanziari (2017) *BRRD e Bail-in Implicazioni per l'analisi del settore finanziario e la tutela dell'Investitore*.

To conclude, considering the choices already taken on MREL implementation and the amendment proposals made by the competent authorities, in the next future the regulatory framework set out by the Bank Recovery and Resolution Directive will be substantially reviewed to enhance the effectiveness of its tools. Moreover it will be accompanied by an even more notable restructuring of national insolvency laws, banking groups' operational organization and liabilities' composition.

2.5 Bank resolution and Bail-in cases after the BRRD

The previous sections provided a theoretical illustration of the Bail-in and the MREL, identifying the shortcomings and future evolution of their regulations. However to analyse these topics from another point of view, it is worth to give a brief description of some bank resolution cases occurred in the European Union after the adoption of the BRRD.

Since the BRRD came into force, a full-scale Bail-in did not happen yet. In fact, in the European Union, also the resolution processes that most get close to its theoretical application as explained in the BRRD, the resolution of HETA asset management vehicle in Austria and the resolution of Andelskassen Bank in Denmark, resulted to be considerably different from a full-strength bail-in.

In 2016, the Austrian resolution authority decided to apply the Bail-in tool to the HETA⁶⁷ resolution, in which all the equity and subordinated debt was written down and the senior creditors lost the 54% of the face value of their holdings. Nevertheless, due to a complex system of regional entities guarantees and mistakes in the allocation of the losses assigned to creditors of the same class resulting in a breach of the "NCWO" principle, the Austrian court judged the practical execution of HETA resolution as a violation of the property rights. To settle these issues the Austrian Government, since the beginning of the bank's distress, have injected in the institution around 5.5 billion of euro.

In Denmark, once the authorities identified the financial condition of the Andelskassen Bank⁶⁸ was no longer viable, they decided to put it into resolution using a combination of the bail-in tool and the bridge bank tool.

⁶⁷ World Bank Group (2016a) *Bank resolution and bail-in in the EU: selected case studies pre-and post BRRD*.

⁶⁸ European Parliament (2016) *"Bail-ins" in recent banking resolution and State aid cases*.

In fact, to absorb the losses the national authorities cancelled the value of Andelskassen shareholders equity, subordinated and senior creditors and constituted a new bridge bank put under the control of the Danish financial stability company (Finansiel Stabilitet). This latter is the state-owned company established to manage distressed financial institutions until a credible private buyer is found. This did not happen, forcing the financial stability company to handle the liquidation of the institution, whose costs have been indirectly borne by the Danish taxpayers.

These two cases highlight that, although the banks' shareholders and creditors faced a massive bail-in process, both national governments contributed to some extent with public resources to mitigate the effects of their resolutions on the economy. At the same time, other European countries faced banks' resolutions. However they adopted different approaches opting to use a combination of strategies relying only partially to a Bail-in, to avoid the contagion effect and instability that may be triggered if the senior creditors are touched.

In Italy, the approach taken to deal with distressed banking institutions seems to be avoiding as much as possible the use a full-scale Bail-in, as clear from the strategies adopted first for the resolution of four small Italian banks (Banca Marche, Cassa di Risparmio di Ferrara, Banca Etruria and CariChieti) and later for Monte dei Paschi di Siena and the Veneto's Banks.

In the first cases, their resolution started with the absorption of the losses through the equity and subordinated debt values cancellation, and later they were split into a newly formed bridge banks and a common "bad" bank with the financial support of the Italian Resolution Fund, financed by the major Italian banking groups⁶⁹. In the case of MPS⁷⁰, the crisis of the institution was dealt with a public precautionary recapitalization, allowed by the BRRD as an extraordinary intervention measure, and the partial sale of the non-performing assets to third counterparties.

In the most recent cases of Banca Popolare di Vicenza and Veneto Banca⁷¹, although the ECB concluded that they were likely to fail, their resolution was not considered of public interest and they were put into ordinary insolvency procedure to avoid their Bail-in. Nevertheless, their equity and subordinated debt holders saw their securities' values wiped out and the Italian government agreed to finance Intesa Sanpaolo to purchase the good assets of the banks. Moreover it will guarantee their non-performing assets that will be held by a separate asset management company.

⁶⁹Bank of Italy (2016b) *Information on Resolution of Banca Marche, Banca Popolare dell'Etruria e del Lazio, Cassa di Risparmio di Chieti, and Cassa di Risparmio di Ferrara crises.*

⁷⁰ Bank of Italy (2016c) *The 'precautionary recapitalization' of Banca Monte dei Paschi di Siena.*

⁷¹ Bank of Italy (2017) *Informazioni sulla soluzione della crisi di Veneto Banca S.p.A. e Banca Popolare di Vicenza S.p.A.*

Almost in the same time, the crisis of the Banco Popular⁷², the sixth Spanish banking group by size, has been handled quickly by the first resolution action taken directly from the Single Resolution Board. In fact, determined that its resolution was unavoidable to safeguard the public interest, the SRB forced the equity and AT1 instruments write off and the conversion of the Tier 2 instruments into new equity, followed by the sale of the entire bank to Banco Santander at a nominal price. In addition, the purchaser agreed to recapitalize the resolved bank injecting seven billion euro of capital. This strategy prevented any need to bail-in creditors beyond those holding regulatory capital, creating a new entity sufficiently attractive to be sold to a private purchaser.

To conclude, the purpose of this paragraph is to highlight that up to now, the European resolution authorities have decided to use the Bail-in only in combination with other resolution tools and above all, contrary to what prescribed in the BRRD, it has been supported by governments' financial help or avoided at all.

⁷² KPMG (2017) *Single Resolution Board: Contrasting outcomes for banks SRB: Contrasting outcomes for banks*.

3 MREL quantitative assessment

3.1 Rationale to evaluate the MREL in European banks

In chapter 2, we described how the BRRD has changed the European regulatory framework, introducing a broad set of new rules to deal with the resolution of a bank.

The BRRD foresees the Bail-in tool as the landmark of the future banking resolutions, nevertheless it is a matter of fact that, the European supervisory authorities decided to not apply its norms in full. In fact, in all the cases illustrated previously, the shareholders and subordinated creditors borne the major part of the losses incurred by the failing institutions, but in most of the cases, the national authorities avoided to go ahead threatening the senior creditors. In the only two cases where it happened, the national governments contributed to safeguard the system stability partially indemnifying or protecting creditors and depositors. Moreover, they were two very small sized banks. In the other cases the supervisory authorities opted to use a combination of public support and private sector solutions.

Nevertheless, it is uncertain what will happen if instead of these small or medium banks, a bigger or a systemically important bank would go through a resolution process. In this event, a private purchaser would be difficult to find, and the rescue of the failing institution would be possible only with a full-scale Bail-in. Otherwise there would be the need of a massive injection of public funds, choosing deliberately to circumvent the BRRD rules.

For these reasons, at least for systemically important institutions, it is compulsory to have enough resources to face a possible Bail-in resolution. To this purpose, the BRRD introduced the MREL, which represents a robust supervisory requirement that enables the practical viability of the Bail-in tool.

A MREL quantitative analysis is not a completely new study, in fact the EBA already performed its own one, to assess the response of the European banking sector to simulated scenarios about the requirement application, using old data as of December 2015. Nevertheless since that time, the regulatory environment has consistently evolved and above all, the EBA study did not analyse the possible benefits of this requirement for the bank individually.

Therefore, we believe that performing a new MREL quantitative assessment on a sample of systemic European banking groups, it is a valuable exercise to understand their current ability to face a Bail-in process. In addition, this analysis allows us to compute a possible estimate of the costs the sample of banks will face to adapt to the likely regulatory evolution.

To do so, we carried out a scenario analysis considering the most probable amendments in MREL rules and the newly proposed approaches on its implementation. To conclude this work, we decided to analyse the possible benefits of its application from another point of view, studying the relationship between the regulatory capital and the level of risk of a financial institution.

In no manner, the following analysis should be interpreted as an indication of compliance or non-compliance of analysed banks with actual MREL requirements, as these requirements are yet to be determined and will only be phased-in progressively. However, it may constitute a approximative image of their resilience to prospective supervisory frameworks.

3.2 Literature review

In December 2016, the EBA delivered a report to the European Commission about the MREL application in the European Union⁷³, upgrading its preceding technical standards released in July 2015. The report covers several areas including proposals on appropriate adjustments to amend the MREL norms, its consistency with international standards and a quantitative analysis of its introduction effects within the EU.

The EBA performed its quantitative analysis on a large sample of 133 European banks using data as of December 2015, to assess how the European banking sector may react to different scenarios in the calibration of the MREL requirement and considering different options on instruments eligibility criteria. The EBA analysis first computed the estimates of banks' MREL ratios, studying the amount and composition of their eligible liabilities, then it assessed the MREL impacts on banks' costs of debt, loans rates and the euro-area GDP. We summarise the EBA findings below.

The average MREL ratio of EU banks was approximately 37% of RWAs as of December 2015. This high percentage means that on average, the European banks are resilient to financial shocks and hold an adequate amount of liabilities that can be included in the MREL and hence theoretically used in the event of a Bail-in. Nevertheless, the results are heterogeneous across the sample. In fact, the systemically important banks have levels of MREL ratios well below the smaller institutions, 32% against 48%. However, it is interesting to point out the composition of the eligible liabilities, given that the half of the MREL instruments were senior debt and unsecured deposits that as highlighted in the previous sections, only in exceptional cases, have been used into a Bail-in process.

⁷³ European Banking Authority (2015) *EBA FINAL draft Regulatory Technical Standards on criteria for determining the minimum requirement for own funds and eligible liabilities under Directive 2014/59/EU*.

Thus, although not said explicitly, the EBA analysis discovered a severe shortage of equity and subordinated instruments across the European banking system.

The report continued with a scenario analysis targeted to estimate the banks' costs to restructure their liabilities to comply with simulated regulatory frameworks. The identified costs for the whole European banking sector range between 3 to 6 billion of euro according to the regulatory scenario adopted, that may cause a considerable increase in loans' rates.

On the other hand, the EBA analysis considered the MREL introduction has a factor that may influence positively the stability of the European economy. In fact, the fulfilment of this requirement should enable a failing bank to face a Bail-in process, reducing the likelihood that a related sovereign rescue and a financial contagion occur. The EBA computed the MREL application benefits in term of euro-area GDP percentage points, using several macroeconomic models, discovering that its benefits are far bigger than the related costs. Indeed, the net benefits of its introduction can reach up the 1% of overall European GDP.

In December 2015, the Bank of England performed an analogous analysis to discover the effects of its new MREL approach set for UK banks. Also in this case, its application would lead to a consistent net benefit that ranges from 0.3% to 0.9% of UK annual GDP.

It is worth mentioning here that, both the previous impact assessments have been deeply influenced by the evaluation framework used in the report "Assessing cost and benefits of Total Loss Absorption Capacity (TLAC) requirement implementation"⁷⁴ submitted to the Financial Stability Board by the Bank for International Settlements on November 2015. This report assessed the micro and macro-economic impacts of the implementation of TLAC standard on the global systemically important banks, discovering that the overall benefits of TLAC enforcement on sovereign GDPs are significantly higher than the related costs.

To conclude, all the previous MREL and TLAC quantitative analysis followed a similar and complex methodology, discovering that in the near future the application of both requirements will cause some drawbacks on the banking activities. Nevertheless, their benefits exceed their costs, thus the supervisory authorities can consider them as useful regulatory tools able simultaneously to enhance the financial system stability and boost the economy.

⁷⁴ Bank for International Settlements (2015) *Summary of Findings from the TLAC Impact Assessment Studies*.

3.3 Data

This paragraph aims to explain briefly the sample of banks we chose, and the data used to perform this MREL analysis, providing a necessary introduction to the following sections.

To carry out this work, it was crucial to choose banks that due to their large and complex structures, systemic importance and risk profiles should be all subject to a Bail-in as resolution strategy. Thus, we chose the 8 largest European systemically important banking groups by asset size (the total sample's asset size amounts to 8.250 billion euro), with serviceable CDS and debt structures data available on Reuters database as a binding constraint. As an additional criterion, to include as much as possible several member states' groups, we chose institutions from five different European countries that did not yet modify the insolvency laws or introduced the structural subordination. This choice means that for the banking groups included in this sample, up to this moment, the easiest way to comply with future amendments in MREL norms and the TLAC standard is to start a progressive restructuring of the liabilities.

The banks chosen are: two Italian groups Intesa Sanpaolo (ISP) and UniCredit (UNI); two French groups Crédit Agricole (CAGR) and Groupe des Banques Populaires et des Caisses d'Epargne (BPCE); two Spanish groups Banco Santander (BSAN) and Banco Bilbao Vizcaya Argentaria (BBVA); one Swedish group Nordea Bank (NRD), one Dutch group ING Groep (ING).

Determined the banks to include in the sample, it is useful to describe all the data used to compute the MREL ratios and the regulatory requirements. To retrieve the MREL eligible instruments amount for each bank, we considered the banks' debt structure available on Thomson Reuters as of 18th July 2017, where the liabilities outstanding have been sorted according to different criteria: instrument type, issue date and above all seniority type and amount outstanding. All these characteristics are crucial to determine whether the liabilities can be considered eligible to be included into the MREL. In addition, to compute the ratios we needed the amounts of Common Equity Tier 1 (CET 1) and as denominators the Risk Weighted Assets (RWAs) and the Total Liabilities and Own Funds (TLOF) collected from the last financial reports as of June 2017.

To construct the regulatory requirements in accordance with the newly proposed approaches decided by the Single Resolution Board and the Bank of England, it is essential along with the Basel III standard requirements to consider the specific additional capital buffers the banks are currently subject to. To do so, we retrieved the SREP Pillar 2 requirements, the capital conservation buffers, the countercyclical buffers, the systemic risk buffers for each bank in the sample from their last financial reports.

Therefore, each regulatory threshold in this analysis is individually tailored, differing from the EBA analysis that used uniform assumptions to construct the possible regulatory requirements. The data described above concern only the first part of the analysis, in further sections we will use extensively the banks' stock quotes and the credit default swap premia on their bonds. To avoid any repeats, we address to the following sections their detailed illustration and rationales.

3.4 MREL assessment

3.4.1 MREL ratios

This MREL assessment starts with the evaluation of the MREL eligible liabilities outstanding as of 18th July 2017 of the bank in the sample. As described in the previous paragraph, the debt data available on Reuters database allow us to sort the liabilities in different categories and detect the overall amount of securities eligible to be included into the MREL.

To identify the suitable liabilities is essential to have a knowledge of the rules provided by the BRRD that we explained in section 2.4.1. To summarise, the BRRD discipline excludes the covered deposits⁷⁵, secured liabilities, liabilities with a residual maturity less than 1 year and derivatives to be eligible for MREL purposes. Therefore, the MREL should be composed by any kind of bank's capital and reserves, as well as all subordinated, senior and unsecured liabilities respecting the previous requirements.

In this analysis, we decided to compute two different MREL ratios considering the current and future regulatory environments. The first one is the MREL TLAC ratio, considering the future alignment of the two requirements. It is formed by all the liabilities that can be currently eligible both for MREL and the TLAC standard, specifically it includes the common equity tier 1 and the total amount outstanding of subordinated liabilities with a residual maturity higher than 1 year. The rationale behind the choice to evaluate the MREL TLAC ratio is that, up to now, only equity and subordinated instruments proved to be realistically able to tackle losses and to allow a bail-in process. Therefore, assessing the MREL TLAC instruments' amount provides a credible sight of the ability of a bank to be resolved through a bail-in.

⁷⁵ Covered Deposits (Guaranteed or Reimbursable or Repayable): deposits obtained from eligible deposits when applying the level of coverage provided for in your national legislation (Financial Times Lexicon).

The second one is the MREL BRRD ratio that includes all the liabilities virtually eligible for the MREL according to the directive rules. Hence, it includes the previous MREL TLAC instruments' amounts and the sum of all outstanding senior and unsecured liabilities with a residual maturity higher than 1 year. The assessment of the MREL BRRD ratio is useful to identify the gross amount of MREL eligible liabilities in our sample and to allow the comparisons with the outcomes of the previous EBA analysis and the MREL TLAC ratio of the same bank.

It is worth mentioning that, although according to the BRRD rules the unguaranteed retail deposits can be counted inside the MREL, we decided to omit them in the estimate of our MREL BRRD ratios for two different reasons. In the first place, the lack of available information about retail deposits composition in the banks analysed makes impossible to divide the deposits between guaranteed and not guaranteed. In addition, the guidelines published by the EBA in December 2016⁷⁶ suggest excluding from the MREL count, any deposit that confers the owner the right to withdraw money with less than one-year notice. Therefore, the EBA suggests at least to rule out all the saving accounts to be MREL eligible.

So far, we described the characteristics, rationales and the data needed to compute the two MREL ratios. Nevertheless, it is useful to show a graphic example of a bank debt structure used to classify the liabilities. Figure 12 shows the breakdown and amount outstanding in billions of euro of the debt securities held by Banco Bilbao Vizcaya Argentaria SA as of 18th July 2017.

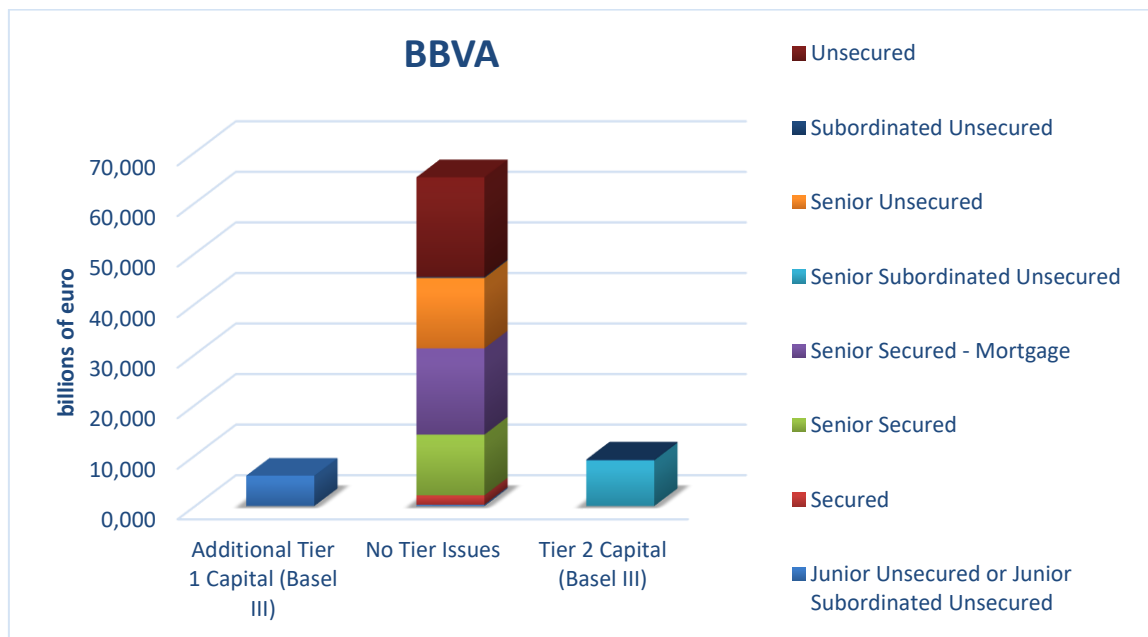


Figure 12 - BBVA debt structure breakdown (Thomson Reuters)

⁷⁶ European Banking Authority (2015) *EBA FINAL draft Regulatory Technical Standards on criteria for determining the minimum requirement for own funds and eligible liabilities under Directive 2014/59/EU*.

The seniority categories represented in Figure 12 are common in all the bank analysed and represent crucial inputs for MRELS estimates. In fact, except for the secured instruments (Senior Secured - Mortgage, Senior Secured, Secured), our MRELS estimates include all the remaining liability categories. The debt securities have been additionally divided for instrument type and maturity date, to get rid of the liabilities maturing within one year and of the liabilities arising from derivative instruments.

Therefore, we computed the MREL TLAC eligible amounts adding to the banks' common equity capital all the amount outstanding of subordinated debts. The subordinated debt includes the AT1, TIER 2 capital instruments and all the remaining subordinated liabilities with a maturity of more than one year included into No Tier Issues category. In addition, the MREL TLAC ratios include for 4 banks in our sample (Banco Santander, BPCE, ING and Crédit Agricole) the newly introduced senior non-preferred instruments. In fact, although they are formally qualifiable as senior debt, still they are contractually subordinated to the other senior liabilities with the same ranking in insolvency. Starting from the MREL TLAC estimates, we retrieved the MREL BRRD amounts by adding to the first ones the amount outstanding of senior and unsecured instruments.

To allow the comparison with the regulatory thresholds, that we will describe in the next paragraph, it is useful to calculate the MREL ratios in term of risk weighted assets and total liabilities and own funds. Table 1 shows the computed ratios and the sample average.

MREL RATIOS*	BBVA	CAGR	ING	ISP	NRD	UNI	BPCE	BSAN	Average
MREL TLAC / RWA	15,92	22,70	20,15	19,27	27,42	19,26	20,14	17,75	20,33
MREL BRRD / RWA	20,43	41,29	32,97	41,77	65,78	33,80	34,94	27,61	37,32
MREL TLAC / TLOF	8,45	6,78	7,25	7,38	5,53	8,21	6,36	7,74	7,21
MREL BRRD / TLOF	10,85	12,33	11,87	15,99	13,26	14,41	11,03	12,04	12,72
MRELS ratios (white) and sample averages (yellow) in %									
*MREL (Minimum Requirement for Own Funds and Eligible Liabilities); RWA (Risk Weighted Assets); TLOF (Total Liabilities and Own Funds);									
TLAC (Total Loss-Absorption Capacity Standard)									

Table 1 - *MRELS / RWAs and TLOFs ratios in percentage points*

The results shown in Table 1 point out that the overall average amount of MREL eligible liabilities is 37,32%, meaning that the banks in the sample have enough resources to virtually face a bail-in process. This value is higher than the 32% identified for systemically important institutions in the previous EBA study. This evidence may signify that the banks, in the last two years, have already begun to issue new debt to adjust their liability side to comply with the regulatory frameworks. Nevertheless, it is worth mentioning that due to the huge difference in samples' dimensions, carrying out a precise comparison with the EBA data can be misleading.

Instead, it is important to highlight that, the amount of equity and subordinated securities included in the MREL TLAC ratios is nearly half of the total amount of eligible instruments (20,33% against 37,32%), meaning that the banks in the sample hold only a limited amount of instruments that have been empirically used to absorb losses and to recapitalize the firm in the previous banking resolutions.

To conclude, although the banks in the sample can be considered resilient and able to tackle possible losses, they still have a liability composition that does not allow for an easy Bail-in execution. In fact, in this event also the senior creditors holdings will be touched with the possibility to trigger a contagion effect. These conclusions will be more clear after the comparison of these results with the simulated regulatory thresholds in the next section.

3.4.2 Supervisory requirements assessment

Once identified the MREL eligible instruments amount and ratios, we decided to construct the possible MREL requirements according to the newly proposed approaches in MREL settings envisaged by different resolution authorities, to understand the current ability of the banks in the sample to comply with the future supervisory frameworks.

As described in section 2.4, only few EU resolution authorities published their own approach and in this analysis, we considered to compute the regulatory MREL requirements the proposals made by the Single Resolution Board and by the Bank of England.

Therefore, following these proposals we calculated three possible regulatory requirements for each institution: The Informative MREL, the UK MREL, the 8% TLOF MREL. In addition, given that the banks in the sample belong to European countries where the national resolution authorities did not take yet a final decision on MREL settings, we considered these three simulated requirements as equally probable to be implemented. As the standard regulatory requirements, we express them in term of risk weighted assets.

Figure 13 shows graphically the comparison among the three regulatory MREL levels and the MREL ratios for each bank.

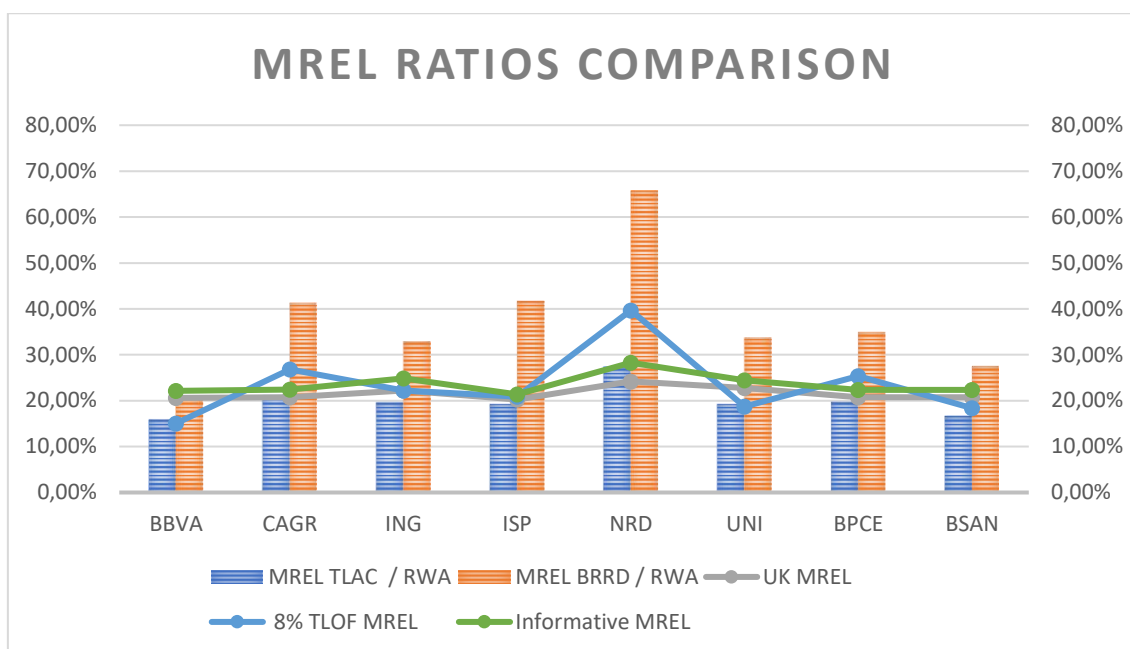


Figure 13 - MRELS ratios and regulatory thresholds graphical comparison

The results illustrated in Figure 13 are not surprising. In fact, all the bank in the sample, except for BBVA Group, have enough MREL eligible liabilities qualifiable for the MREL BRRD ratios, to comply with the three requirements. Therefore, according to the current MREL regulation the banks do not need to change their debt structures for regulatory purposes.

On the other hand, all the banks in the sample do not have enough resources eligible to be included in MREL TLAC ratio to comply with the simulated requirements.

To summarise, if the MREL regulation will remain as it is, the banks will be able to keep their current liabilities composition. Instead if, as it is probable to occur, the EU authorities will amend the MREL rules to be aligned with the TLAC standard⁷⁷, the banks are going to face a progressive restructuring of their liabilities to meet the future regulatory framework.

3.4.3 MREL instruments deficit assessment

Considering the previous considerations, it is worth to determine the numeric amount of debt securities that the banks in the sample will need to issue or roll-over from existing debt to adjust their liability structure to comply with the supervisory requirements. Given that the shortfall amount of eligible instruments associated with the MREL BRRD ratios is negligible, this paragraph focuses on the estimate of the banks' instruments shortage amount related to the MREL TLAC ratios.

⁷⁷ The rationale behind the future amendments of MREL regulation is illustrated in detail in section 2.4.4.

Seen that both the regulatory requirements and the MREL ratios have been expressed in term of risk weighted assets, we computed the shortfall amounts multiplying their differences for the amounts of risk weighted assets for each bank. In addition, as previously explained, each regulatory approach is considered equally probable. Hence to uniform the results the shortfalls considered are an average of the three approaches.

Figure 14 shows the average deficit amount of MREL TLAC instruments in billions of euro and its breakdown for each bank.

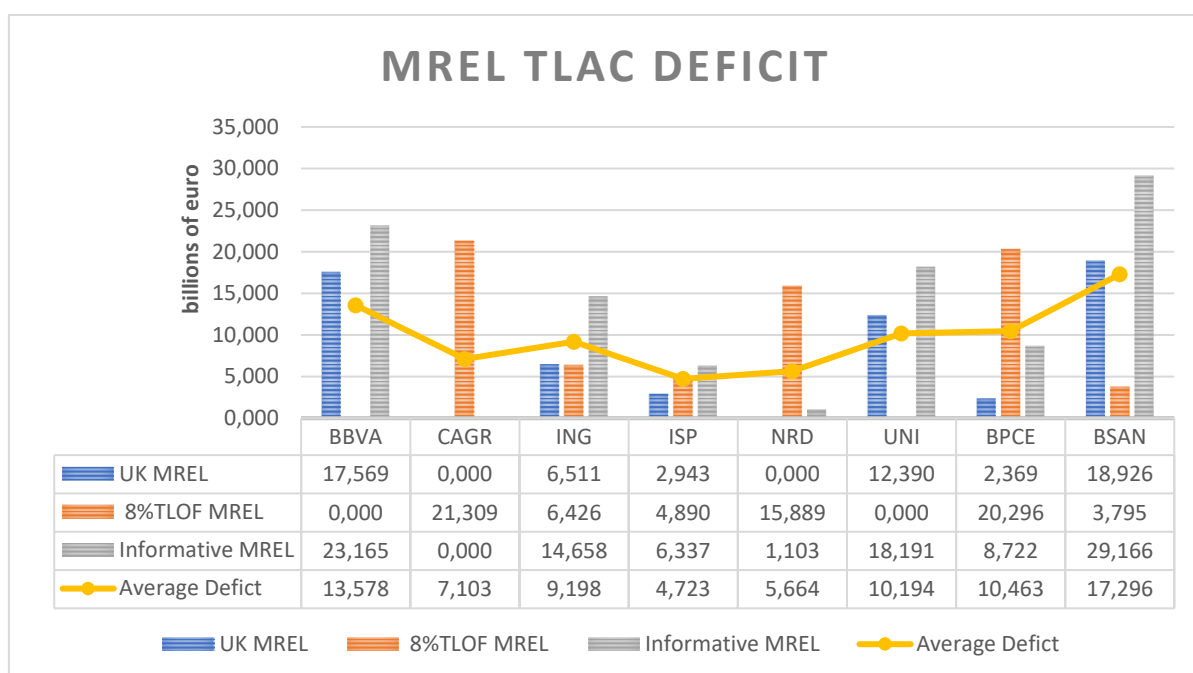


Figure 14 - *MREL TLAC liabilities' deficit for each bank*

The estimates shown in Figure 14 are heterogenous, varying considerably across the sample and according to the regulatory approach used.

At first sight, both the Spanish banking groups have the higher absolute deficits in MREL TLAC securities and, it is interesting to point out that their instruments' shortfall do not relate to their total size, given that their 8% TLOF deficits are null or very small if compared to the others. Their shortfalls are mainly related to the size of their RWAs associated with a non-commensurate amount of instruments readily able to absorb losses. Hence according to our results, they represent the riskiest banks in the sample.

In addition, Figure 14 highlights that at least three banks (Credit Agricole, Nordea and BPCE Groups) show the opposite condition. In fact, their MREL instruments' shortages are mainly due to their size.

Therefore, it is possible to conclude that although they can be considered very resilient institutions in comparison with their degree of risk (RWAs size), they do not hold yet enough resources to be used rapidly to unlock an external aid in case of a severe financial crisis.

Surprisingly, the amounts of MREL TLAC instruments shortfalls of the Italian banks is below the French groups ones. This fact can be misleading, given that the French banks shortages are overwhelming caused by their own size, while for the Italian banks and especially for UniCredit Group, the MREL instruments deficit is due to the unbalance between the size of the RWAs and its suitable MREL TLAC resources.

To conclude, the banks' sample show an aggregate shortage of instruments eligible both for MREL and TLAC requirements of about 78 billion of euro. Therefore, all the banks analysed will face a restructuring of their liabilities to comply with the future MREL regulatory levels. Nevertheless, the required magnitude of the restructuring processes varies considerably across the sample. In fact, the Spanish banks will bear the largest costs in the following years to meet MREL supervisory requirements, while it is not surprising that the northern European groups are the most resilient institutions that will need smaller changes to align to the regulatory framework.

3.4.4 Funding costs evaluation in previous studies

The previous paragraphs highlight the prospective MREL eligible instruments' deficits according to different types of regulatory thresholds and instruments inclusion criteria, while the following ones deal with the estimation of the banks' additional debt costs to meet the new MREL regulatory framework.

We based the evaluation of the costs to meet the MREL requirement on the idea that, the institutions will have to issue new debt securities or replace existing securities with more expensive MREL TLAC eligible ones until they fill their shortfalls. The approach to estimate the costs of the MREL compliance follows the same logic of the European Banking Authority's MREL impact assessment of December 2016 and TLAC's cost and benefit analysis published by the FSB in 2015.

To better define the procedures used to retrieve the target variables and to point out the main differences of this analysis with respect to the previous assessments, it is worth to shortly describe the methodologies as well as the tools adopted in the previous studies with a great focus on the EBA impact assessment.

In the EBA costs assessment, the starting point are the estimated shortages in MREL eligible instruments of European banks as of December 2015 under two possible regulatory setting scenarios. The funding costs to fill the identified instruments needs vary to reflect the differences in issuance costs across each Member State and the different sizes and systemic importance of the financial institutions considered.

For systemically important banks the cost of issuing senior debt was approximated by using an appropriate yield to maturity curve based on their average long-term credit ratings, computed by Bloomberg, which provides information on the yield curves of senior unsecured bonds denominated in euro issued by European banks with ratings ranging from AAA to B-. Figure 15 shows the Bloomberg yield curve.

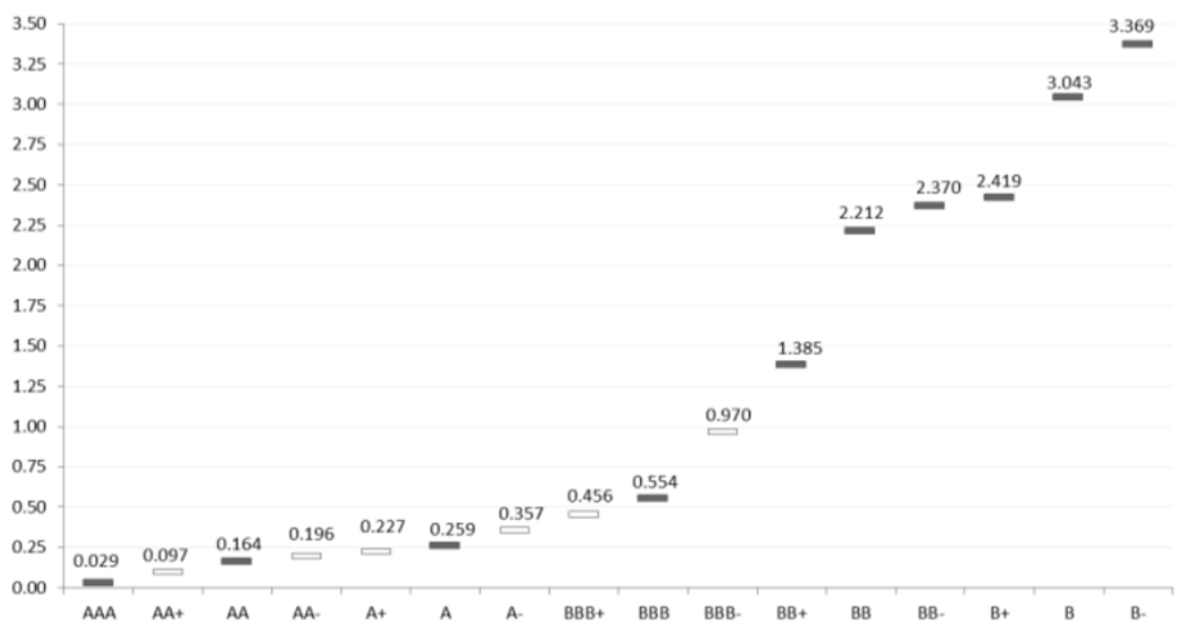


Figure 15 - EUR financials yields mid YTM (BVAL); Maturity 5 years; rating AAA to B- (Source: Bloomberg and EBA, 2016)

While, to estimate the cost of issuing subordinated debt for the same systemic banks, the EBA analysis used two different approaches. For G-SIBs the subordinated debt costs have been computed by adding to the senior securities price a subordinated premium of 65 basis points, as suggested by market evidences observed in the z-spread⁷⁸ differences between the structurally subordinated debt issued by UK holding companies and the senior instruments issued by the operating companies of the same group.

⁷⁸ The Z-spreads and the CDSs spreads will be described in detail in the following paragraph 3.4.5.

Instead for O-SIIs, the subordinated costs based on the senior debt price increased by 133 bps, implied by the difference as of November 2016 of the spreads between the 5-years iTraxx Europe Senior and Subordinated Financials Indexes that represent the benchmark CDS indexes on bonds issued by European financial institutions.

In addition, to increase the accuracy of MREL cost assessment, the EBA analysis determined what amount of subordinated instruments need can be met by replacing maturing senior debt and what amount can be met with new issuances, assuming that banks can easily roll-over senior debt with a remaining maturity within 5 years. In the end, the EBA analysis computed the additional cost of funding multiplying the costs of senior and subordinated debt, mentioned above, by the identified needs of MREL eligible instruments.

The TLAC⁷⁹ cost and benefit analyses follow the same steps of the EBA assessment, estimating the average cost of bank funding using the z-spreads for TLAC-eligible liabilities. However, it respects the existing debt maturity profile of the institutions, meaning that the banks with a significant portion of short term liabilities (with a maturity within 1 year) have a business reason to do so and will not be able to convert them into TLAC eligible securities.

3.4.5 Debt instruments pricing tools

As seen in the description of the previous analysis, the main instruments used to price the debt issuance costs are the Z-spreads and the CDSs spreads.

The Z-spread, also known as the zero-volatility spread or static spread, measures the difference between the yields of a risky bond and a risk-free one (usually a government bond). It is a more accurate instrument in bond pricing respect to the nominal benchmark spread, since it captures the difference in yields over the entire rate curve, while the second one measures the spread at just one point in time. Usually for plain vanilla bonds⁸⁰, the z-spread will only slightly diverge from the nominal spread. The difference mainly comes from the shape of the term structure and the bond characteristics.

A CDS is a derivative contract that typically provides insurance against non-payment of a bond. The buyer of this protection makes payments to the seller until the maturity date of the contract or until the credit event occurs. These payments express in basis points and they are known as the CDS spreads.

⁷⁹ Bank for International Settlements (2015) *Summary of Findings from the TLAC Impact Assessment Studies*

⁸⁰ A plain vanilla bond is a bond without any unusual features; it is one of the simplest forms of bond with a fixed coupon and a defined maturity and is usually issued and redeemed at the face value (Financial Times Lexicon).

If the reference bond defaults, the buyer of the CDS receives a pay-out usually equal to the face value of the bond and the seller may take its ownership. The CDS spreads increase when the reference bonds become riskier and so can be used to assess investors' perceptions of a bank's credit risk, serving as a proxy for the bank's cost of wholesale funding.

The bondholders of a bank are more likely to be repaid in full when banks are more resilient to shocks to the value of their assets. More resilient banks should thus tend to face lower debt costs and the CDS sellers on these bonds will demand lower premia. These evidences have been shown in the report published by the Bank of England⁸¹ in 2012.

The Bank of England carried out its analysis on a sample of the 20 largest European banks by asset size, comparing their capital ratios with banks' 5-year senior CDS premia as proxy of their wholesale debt costs. They discovered that the relationship flattens out at higher capital ratios, showing that CDS premia are less sensitive to a given financial shock when market-based capital ratios are higher. This is likely to reflect the fact that, more resilient banks can more easily absorb losses to the value of their assets without impairing their ability to repay bondholders in full. Therefore, as suggested by this study, the banks with higher market-based capital ratios tend to have lower CDS premia.

Thus, both CDS spreads and senior unsecured bond spreads can be used as a gauge of a bank's funding costs and, in most of the times, both measures imply a broadly similar level of bond issuance costs. Their main difference is the liquidity and availability of data. In fact, to compute consistent estimates of funding costs using z-spreads we need a large amount of bonds of the same currency and maturities in all points in time, which are not always retrievable. On the other hand, consistent time-series data for CDS premia are readily available, especially for five-year CDS spreads since they are the most liquid CDS contracts.

3.4.6 Evaluating MREL costs

The previous sections describe the methodologies used by the preceding analysis as well as provide a theoretical illustration of the debt pricing tools adopted in this MREL assessment.

Retrieved the results about the MREL TLAC instruments shortfalls for each bank, discussed in paragraph 3.4.3, the next step is to estimate a good approximation of their additional funding costs to replace existing securities with more expensive subordinated ones until they can meet completely the proposed regulatory requirements and set a plausible time horizon for our MREL assessment purposes.

⁸¹ Bank of England (2012) *Financial Stability Report*.

A 5-year maturity is assumed as the benchmark time horizon for our assessment given that the term sheets for the TLAC standard and the MREL foreseen by the UK and Swedish authorities, all identify the 2022 as the year of the fully implementation of the requirements. In addition, the 5-years CDS contracts are the most liquid ones, with time series quotes readily available on Thomson Reuters database.

Given the lack of data regarding the z-spread differentials for all the banks evaluated in this analysis, we decided to gauge the additional funding costs to replace existing senior liabilities with subordinated ones, using the differences between the 5-years CDS weekly spreads quotes on senior and subordinated Tier 2 debt instruments⁸² from October 2008 until July 2017.

The EBA analysis, to approximate the additional funding costs for the systemically important banks, applied the same difference in CDS spreads in just one point in time to all the institutions in its sample. This approach did not consider the banks' individual peculiarities, and above all, neglects that an evaluation of their debt restructuring costs based only on a single date may lead to biased estimates, seen that these processes will take a long time to be completed.

Hence, to overcome these issues we decided to estimate the additional debt costs using only bank specific CDS data and to retrieve a more robust estimate by computing a weighted average of the differences in CDS weekly quotes of the past 5 years, from July 2012 until July 2017, applying a decreasing weight from more recent to older observations.

Given the lack of CDS quotes available for BPCE Group, we approximated its spreads using the iTraxx Indexes. To further verify the accuracy of the iTraxx indexes spreads to serve as a good approximation, we computed the correlations of each bank spreads with the iTraxx ones, separately for CDS quotes on senior unsecured and subordinated debt instruments, using data from 10/2008 until 07/2017. Annex A displays the correlation matrices.

Not surprisingly, the results show that both senior and subordinated iTraxx indexes spreads are highly correlated with all the banks' CDS quotes in the sample. Therefore, we assumed the differences in spreads between the iTraxx indexes as a possible close estimate of BPCE Group cost of debt.

An additional reason to weight decreasingly the CDS observations according to the time is that, from 2012 to 2014, the CDS spreads values showed a sharp surge in conjunction with the European sovereign debt crises. While from 2014 onwards, their values flattened out.

⁸² The CDS spreads relate to CDS contracts with a modified restructuring (MR) clause.

To give a graphical view of the CDS quotes movements from 2008 onwards, Figure 16 illustrates the historical paths of 5-year senior and subordinated CDS weekly spreads of seven banks in the sample and the iTraxx indexes. Furthermore, Table 2 displays the estimated weighted averages values of the CDS spreads for each bank.

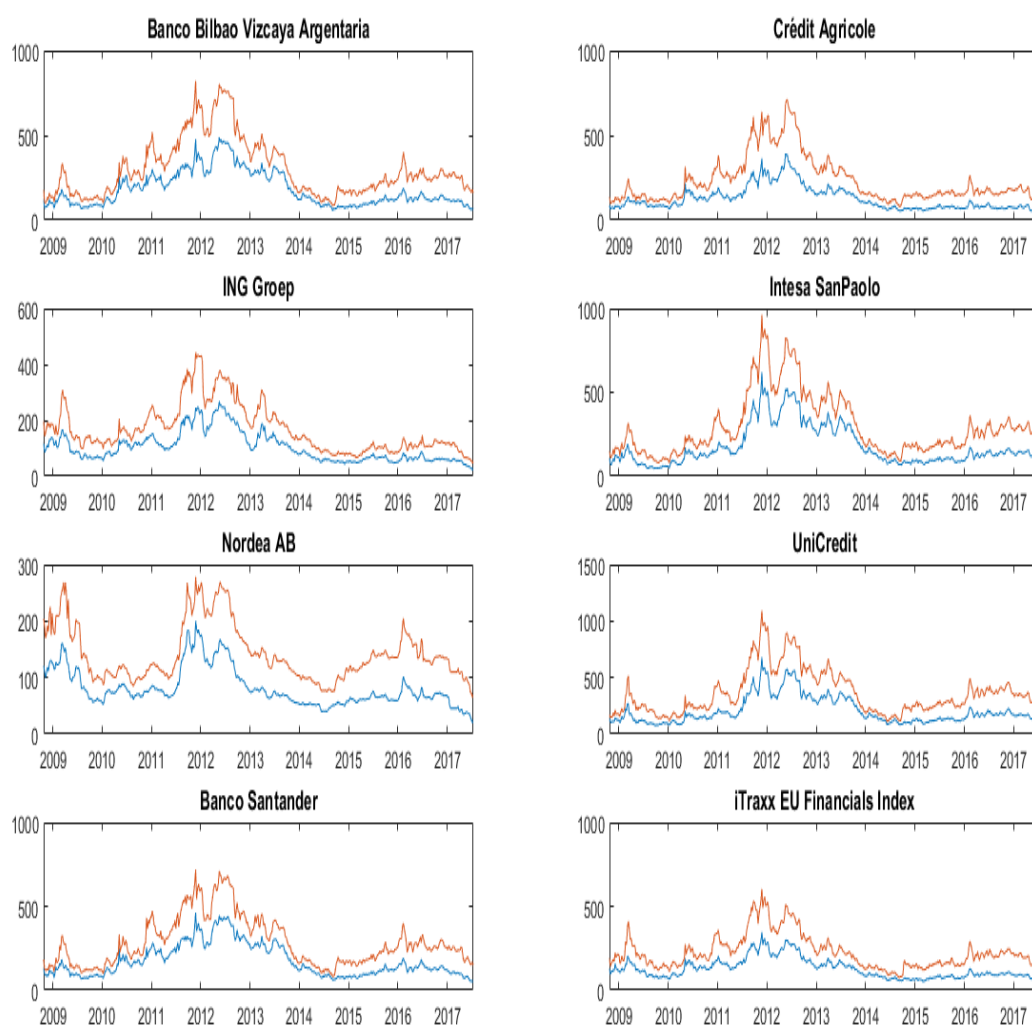


Figure 16 - *Historical paths of 5 years Senior (light blue) and subordinated (red) CDS weekly mid spreads from 24/10/2008 until 14/07/2017 expressed in basis points*

Sample Banks*	BBVA	CAGR	ING	ISP	NRD	UNI	BPCE	BSAN
CDS spreads	109,78	84,61	43,48	116,78	63,99	154,47	92,07	110,35
CDS spreads are the weighted averages of the CDS weekly quotes differences from July 2012 to July 2017								
*Spreads reported in basis points								

Table 2 - CDS weighted averages spreads from July 2012 to July 2017

To summarise the results obtained so far, we identified the deficit of instruments eligible to be included in the MREL TLAC requirements for each bank in the sample and we computed the estimates of their additional funding costs represented by the CDS spreads differences shown in Table 2.

To increase the accuracy of our MREL costs assessment, it is worth to determine precisely what amount of the required MREL TLAC instruments the banks can meet by substituting existing senior non-eligible securities or with new debt issuances. We assumed, as previous studies did⁸³, that banks can easily roll-over senior debt instruments with a remaining maturity within five years. Therefore, we obtained the amounts of senior and unsecured debt outstanding maturing from July 2018 until July 2022⁸⁴ for each bank.

In addition, we chose to exclude the short-term senior debt (maturing within July 2018), given that the average ratio between the short-term liabilities over the total debt issuances held by the banks in the sample is roughly the 20%. This evidence suggests that the institutions have a business reason to keep this proportion and therefore would not be able to replace easily these short-term instruments. The table in Annex B shows the maturity profile in percentage points, the deficit in MREL TLAC instruments, the amount of senior debt suitable to be rolled-over and the amount of MREL TLAC instruments to meet entirely with new issuances for each bank. According to our estimates, the BBVA Group is the only institution that does not have enough senior liabilities to be replaced with MREL TLAC instruments. Therefore, it will be forced to meet a part of its instruments shortage entirely with new issuances, paying them at full funding cost. The full cost of funding can be decomposed into the difference between the subordinated and senior debt cost, that we already computed using the CDS spread differences, and the cost of issue senior debt.

⁸³ We kept this assumption from previous EBA assessment approach (European Banking Authority (2016a) *Final Report on MREL*).

⁸⁴ The assessment of the senior debt outstanding starts on the 18th July 2018 until the 18th July 2022. We chose these dates to be more coherent with the banks' debt structures data.

To approximate it, we used the same appropriate YTM curve⁸⁵ employed in the previous EBA analysis, considering that the last BBVA long-term credit rating released in April 2017 by Standard&Poor's is BBB+⁸⁶. Thus, as displayed in figure 15, we chose as approximation for BBVA senior debt issuance cost the yield associated with its own rating.

Determined the debt amounts the banks would be able to roll-over and those to issue at full cost, we estimated the costs of the liabilities restructuring for each bank to comply with future simulated MREL supervisory requirements, multiplying the amounts of MREL TLAC instruments deficit by the weighted average of differences in CDS spreads for each institution. Table 3 shows the estimates of debt restructuring costs for each bank and the sample aggregate costs.

Sample Banks*	BBVA	CAGR	ING	ISP	NRD	UNI	BPCE	BSAN	TOTAL
Debt restructuring costs	154,6	60,1	40,0	55,2	36,2	157,5	96,3	190,9	790,8
Individual bank costs of debt restructuring (white) and sample aggregate costs (yellow)									
*Data reported in millions of euro									

Table 3 - *Debt restructuring costs for each bank and the aggregate sample value*

Table 3 confirms the outcomes foreseen in section 3.4.3. In fact, both the Spanish banks will bear the highest costs to restructure their liabilities, while it is exactly the opposite for the northern European groups.

In addition, it is interesting to highlight the large difference in the restructuring costs between the two Italian groups in our sample. While it is not surprising that the costs for UniCredit Group align with the Spanish banks ones, the values associated with Intesa Sanpaolo are close to those of the Northern European banks, although Intesa has considerably higher values of CDS premia than those of Nordea or ING Groups. This reality may signify that exists a discrepancy between the investors perception of Intesa risk degree and its real resilience to tackle rapidly financial shocks.

To conclude, the overall sample restructuring costs required by the prospective MREL framework accounts to 790 million of euro. This figure represents only a small number if compared to the whole asset size of the banks, nevertheless these costs will undoubtedly impact negatively on their future performances.

⁸⁵ The YTM curve used in the previous EBA studies has been shown in Figure 15.

⁸⁶ Source: Ratings – BBVA.

3.4.7 Assessing MREL benefits

In the previous sections, we analysed the amount of MREL eligible instruments held at the moment by a sample of European banking groups and we provided an upper bound estimate of the costs these institutions will face to restructure their liabilities in the near future. Thus far, this analysis focused on the costs of implementing the MREL requirements, however we did not consider yet the degree of benefits that the banks in the sample will receive from MREL application.

As explained in the literature review⁸⁷, this MREL assessment follows the approach used in the previous studies made by the European Banking Authority, that concludes its own MREL impact analysis assessing the benefits of introducing the MREL requirement on the aggregate euro-area GDP. The rationale behind is that the European authorities through the MREL implementation foresee to enhance the overall banking system's resilience and stability, forcing the banks to structure their liabilities in a way that simplifies the execution of their resolutions and in so doing minimize the expected costs of failure for the EU economy. The EBA analysis computes these effects through several macroeconomic models, estimating a positive net benefit that may reach the 1% of euro-area aggregate GDP.

Thus, it is evident that the EBA analysis assesses the benefits of MREL implementation only at an aggregate level considering the impacts on GDP, neglecting to analyse the benefits for the individual banks. Therefore, it is worth to evaluate, if the MREL introduction will cause some positive effects on the creditworthiness and financial credibility also at bank specific level.

The credibility and degree of risk of a financial institution is a hard task to quantify due to the large number of micro and macro-economic factors affecting the stability of a bank in a certain point in time. Nevertheless, we can use again the CDS premia to retrieve an approximate estimate of banks' degree of risk perceived by the investors.

The CDS premia represent the cost of an insurance for debtholders in case a bank defaults: higher is the cost of an insurance higher is the perceived degree of risk, thus the investors set higher premia to institutions they consider riskier. The CDS spreads on senior and subordinated instruments reflect the degree of risk of the underlying securities and their differences more than their absolute values are useful tools to approximate the perceived soundness of a bank.

In fact, up to this moment the senior debt remained largely untouched during any bank's resolution, while the holders of subordinated instruments have borne the largest costs since their holdings went to absorb losses and recapitalize the failing banks.

⁸⁷ Chapter 3.2.

These evidences highlight that practically the senior instruments can be considered almost safe assets for their holders and moreover, their level of safety is doomed to increase with the alignment of the MREL regulation to the TLAC standard. In fact, in the near future the banks will issue a significant amount of subordinated liabilities that will protect even more the senior creditors holdings.

Therefore, the difference between senior and subordinated CDS premia of the same banks can be seen as a risk ratio among virtually riskless senior instruments and risky subordinated ones, representing a better term of comparison to assess the risk degree among different banks than the simple comparison between their CDS spreads absolute values.

Moreover, analysing the CDS time series from October 2008 until July 2017, the differences in CDS spreads of the same bank are much less volatile than their absolute values, meaning that this variable allows not only for a better comparison among banks, but it represents also a more robust tool to evaluate the degree of risk of the same bank in different points in time. Annex C displays the summary of the main statistics of the CDS spreads series.

Identified the target variable, the purpose of the following analysis is to evaluate its relationship with the MREL ratios, and above all identify whether introducing the MREL really may lead to an increase in banks' credibility through a reduction in the CDS spreads difference.

3.4.8 Panel data analysis

The methodology adopted to identify this relationship is a panel analysis using bank specific data, available on Reuters and Financial Times databases, utilizing a set of 64 observations, 8 for each bank, from 2010 to 2017.

In the panel regression the dependent variable is the difference between senior and subordinated CDS spreads in basis points while the independent variables are the regulatory capital ratios over RWAs, non-performing loans (NPL) ratio over gross loans outstanding amount, return on equity, the stock return and stock volatility⁸⁸.

Due to the impossibility of collecting the past MREL levels and to add more observations in the regression, we approximated the values of the MREL ratios with the historical values of the regulatory capital. This choice is additionally motivated by the future regulatory amendments and by the absence before 2017 of subordinated instruments other than those qualifying as regulatory capital.

⁸⁸ For BPCE group, since it is not listed, its stock prices are approximated using the CAC 40 index representing the benchmark French stock market index composed by the 40 listed firms with the higher capitalization in France and we show the data in the table in Annex D.

In fact, given that soon the MREL rules will be aligned to the TLAC standard, a degree of subordination will be imposed to its eligible liabilities, meaning that the past overall amount of MREL eligible instruments should not be so distant from those forming the regulatory capitals. To conclude the initial dataset illustration, we computed the stock returns and volatilities by calculating from historical weekly prices their logarithms and converting them from weekly to annualized measures.

The equation below shows the model used for the panel analysis.

$$\Delta CDSbps_{it} = \beta_0 + \beta_1 RegulatoryCapital_{it1} + \beta_2 NPLratio_{it2} + \beta_3 ROE_{it3} + \beta_4 StockReturn_{it4} + \beta_4 StockVolatility_{it5} + \alpha_i + \varepsilon_{it}$$

We carried out the panel analysis first by pooling together all the data available assuming the absence of an unobserved group specific factor (no individual heterogeneity) retrieving the Pooled OLS estimates, and then using the Fixed (FE) and Random Effects (RE) approaches to treat the possible existence of individual heterogeneity across the sample.

In the FE model the unobserved variable is assumed partially correlated with the regressor, while in the RE model it is assumed as independently distributed from the regressors.

To allow the treatment of group heterogeneity using FE and RE models, we divided the sample into 4 cross sectional units (Italy, Spain, France, Northern Europe) classified according to the geographical location of the banks. For simplicity ING and Nordea Groups, despite the fact they belong to different countries, are in the same unit due to their affinity in size and credit rating.

Table 4 summarises the results of the three different approaches. It is worth to restate that the dependent variable is the difference between each bank senior and subordinated CDS spreads in basis points, the p-values expressed in parentheses and * indicates statistical significance at 5% level.

Dependent Variable: Differences among 5-year CDS spreads on senior and subordinated instruments in bps
p-values expressed in parentheses

*indicates statistical significance at 5% level

Regulatory capital coefficients and p-values marked in bold

	(1)	(2)	(3)
	Pooled OLS	Fixed Effects	Random Effects
<i>Regulatory Capital</i>	-1.96106 (0.3931)	-2.19153 (0.3392)	-2.14092 (0.3375)
<i>NPL ratio</i>	-0.652111 (0.8139)	-0.0961040 (0.9717)	-0.246378 (0.9264)
<i>ROE</i>	-0.900831* (<0.0001)	-0.456974 (0.6213)	-0.577316 (0.5207)
<i>Stock Return</i>	-1.44119* (<0.0001)	-1.25411* (0.0005)	-1.31349* (<0.0001)
<i>Stock Volatility</i>	2.84216* (<0.0001)	3.14156* (<0.0001)	3.05348* (<0.0001)
<i>Constant</i>	63.0972 (0.2079)	50.4484 (0.3166)	54.3139 (0.2740)
<i>Observations</i>	64	64	64
Diagnostics Tests			
<i>Reset Test (p-value)</i>	0.1966	-	-
<i>White Test (p-value)</i>	0.335506	-	-
<i>Wald Test (p-value)</i>	-	0.056628	-
<i>Breusch-Pagan Test (p-value)</i>	-	-	0.419915
<i>Hausman Test (p-value)</i>	-	-	0.544319

White Test for Heteroskedasticity: reject the null of absence of heteroskedasticity if p-value < 0.05

Wald Test for Heteroskedasticity (FE): reject the null of homoscedasticity if p-value < 0.05

Reset Test for Model Specification: reject the null of adequate specification if p-value < 0.05

Breusch-Pagan Test (RE): reject the null of OLS is consistent if p-value < 0.05

Hausman Test (RE): reject the null of GLS is consistent if p-value < 0.05

Table 4 - Panel data analysis and diagnostics tests

Before analysing the results and interpreting the estimated coefficients, it is necessary to identify whether the models used are adequate to describe the dataset.

The Pooled OLS model assumptions require the homoscedasticity and no autocorrelation among residuals. It is possible to test these assumptions through the White test for heteroskedasticity and the Durbin-Watson statistics for residuals autocorrelation, shown in Annex E. Both tests do not reject the homoscedasticity and uncorrelation of the residuals. Moreover, it is possible to use the Reset test to identify if the Pooled OLS model is misspecified. Also in this case the test does not reject the null hypothesis of the model adequate specification. In addition, to compare the goodness of fit among the models used, it is possible to use two tests: Breusch-Pagan statistics to test if the Pooled OLS estimates are preferred to the Random Effects ones and the Hausman test to identify which between FE or RE models is more adequate to describe the dataset.

Looking at the diagnostics tests in Table 4, the Breusch-Pagan test supports the Pooled OLS estimates rather than those of the RE, while the Hausman test suggests that the GLS estimator is consistent and RE model is more adequate than FE to describe the data. In the end, according to the diagnostics outputs, the Pooled OLS model is the best approach among the others.

Once determined the model that is more suited to describe the data, it is possible to interpret the results of the Pooled OLS model.

The only two significant predictors are the stock returns and volatilities, whose statistical significance and coefficients' signs coincide with those estimated in previous analysis⁸⁹, carried out to identify the determinants of CDS spreads. It is quite intuitive to understand why. In fact, higher stock volatility makes a bank default more likely to occur increasing the risk of the institution, while a higher growth of equity value makes this event less likely, decreasing its degree of risk.

Nevertheless, the purpose of this analysis is not to find the best model to explain the CDS spreads values, but to point out the relationship between the regulatory capital and the difference in CDS spreads. Looking at the Table 4, the negative sign of the regulatory capital coefficients is not surprising given that to higher capital levels coincide less CDS subordinated premia.

⁸⁹ Fonseca, J. Da and Gottschalk, K. (2015) *The Co-movement of Credit Default Swap Spreads, Stock Market Returns and Volatilities: Evidence from Asia-Pacific Markets*.

Although the preceding statement is true, the regulatory capital in all the models used in this analysis, it is not a significant variable to explain the difference in CDS premia, meaning that changes in its levels do not translate explicitly in the reduction of the CDS values. The CDS premia remain clearly linked more to the stock market performances rather than regulatory compliance requirements.

To conclude, our results show that the implementation of the MREL requirement may not correspond to an increase in the market credibility of the banking institutions. Therefore at least at bank individual level the benefits of MREL application are doubtful.

4 Conclusions

This work aims to evaluate the current capacity of a sample of major European banks to face a Bail-in process and to point out the possible serious obstacles in its application. Furthermore, our additional objective was to provide an estimate of the costs and benefits the same banks will incur in accordance with the most likely evolution of the EU banking regulation.

To perform this work was unavoidable to consider the studies already made on the topic. Nevertheless due to the size of our sample, we were able provide a tailored estimate of the MREL application costs for each institution and to analyse its possible benefits for individual banks, a subject that previous studies neglected.

We discovered that the banks analysed have already enough resources to be included in the MREL, without any need of a concrete change in their liabilities composition to comply with the current regulatory rules. Nevertheless, this is a misleading evidence, given that all the banks we analysed have massive shortages of equity and subordinated debt instruments, which up to now, represent the only securities really used to tackle losses in a period of financial distress. Thus, a real Bail-in of these institutions could not be made without triggering a contagion effect and most of all without an external support.

This fact signifies that the MREL rules, as set now in the BRRD, may be useless to assure the practical viability of a Bail-in and they need to be amended. The European authorities already envisaged this need, proposing to align the MREL rules to the TLAC standard, forcing the European banks to rely increasingly on more expensive equity and subordinated debt instruments.

Thus, we computed an estimate of the costs of the debt restructuring to comply with the regulatory environment for each bank, considering their specific risk degree and the actual debt costs. The results obtained highlight that the southern European banks, especially the Spanish ones, will face the biggest costs while the northern European ones will be hit to a lesser extent by the MREL regulation amendments.

The overall debt restructuring costs for the banks analysed amount to roughly 790 million of euro, that it is a small number if compared to their aggregate asset size. Nevertheless, these costs will certainly reduce their performances in the future. It is worth to mention that the costs' estimates we computed reflect the current and past levels of debt instruments prices, but there is no certainty about the future behaviours of the bond markets. In fact, it may happen that there will be no enough investors' demand for the new MREL eligible debt securities, forcing the banks to increase the yields to pay and in so doing to bear even bigger costs.

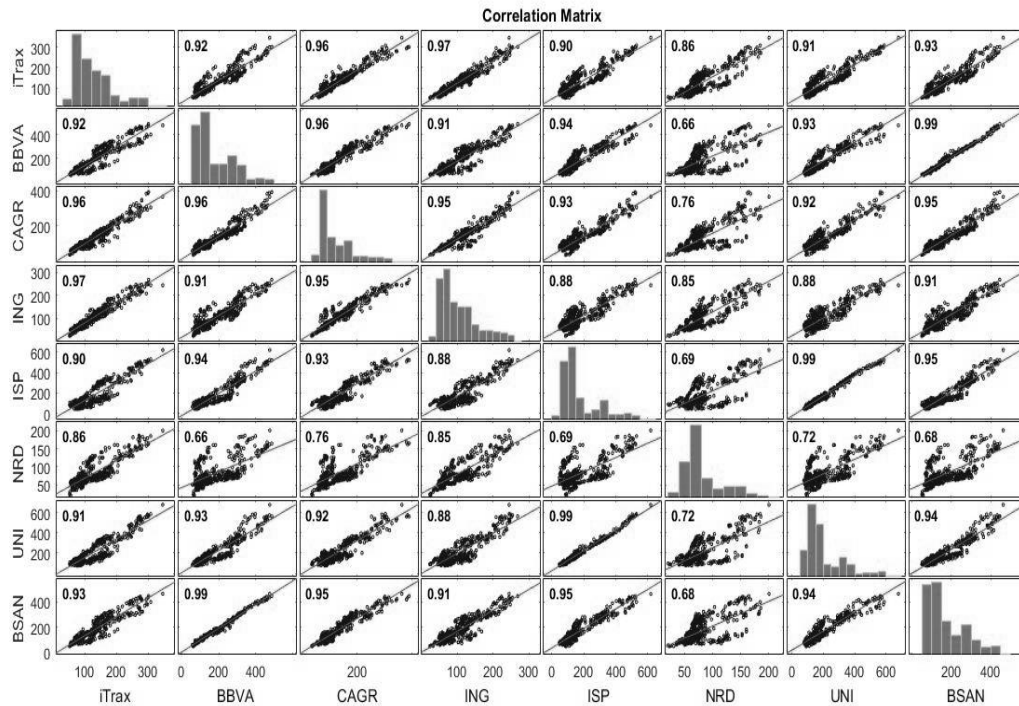
On the other hand, the BRRD foresees that the MREL application will increase the financial credibility of the individual banks, boosting the stability and resilience of the whole European banking sector.

To assess the beneficial effects of the MREL implementation for the individual bank, we decided to analyse the relationship between the historical regulatory capital levels and the CDS spreads. We discovered that the regulatory capitals, of which the MREL is a simple enhancement, are not a significant variable to explain the CDS difference in spreads, meaning that changes in the banks' supervisory requirements may not lead to a considerable reduction in their perceived degree of risk.

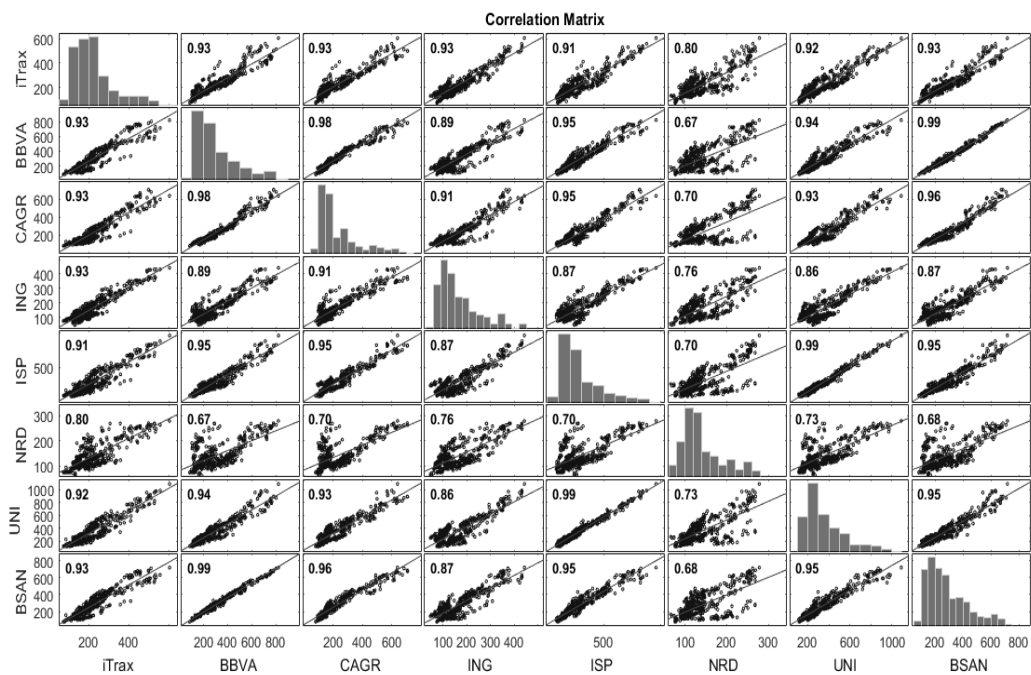
To conclude, we believe that the MREL regulatory framework in the near future will be amended to make finally possible the full application of the Bail-in tool. Nevertheless, it will require the European banks to begin a costly restructuring process of their liabilities, while the MREL benefits in term of a decrease in banks' levels of risk are doubtful.

5 Annexes

5.1 Annex A



Correlation matrix between each bank 5Y CDS Senior mid spreads and 5Y iTraxx Europe Senior Financials Index



Correlation matrix between each bank 5Y CDS Subordinated mid spreads and 5Y iTraxx Europe Subordinated Financials Index

5.2 Annex B

Maturity profiles and instruments deficit	BBVA	CAGR	ING	ISP	NRD	UNI	BPCE	BSAN	Sample Total
Subordinated debt < 1 year maturity	0,325	1,871	-	1,831	0,200	4,132	0,543	0,763	9,665
Senior debt < 1 year maturity	16,741	36,998	17,550	30,242	23,253	35,392	64,283	39,058	263,518
Total Subordinated debt	15,678	31,660	17,035	22,274	10,661	25,797	20,766	30,104	173,975
Total debt Instruments	80,196	208,620	106,927	166,889	191,625	178,394	229,333	221,785	1383,768
Average MREL TLAC deficit	13,578	7,103	9,198	4,723	5,664	10,194	10,463	17,296	78,219
Senior debt to roll-over	12,360	47,828	34,576	46,118	48,163	42,582	35,742	46,411	313,781
New MREL TLAC debt to issue	1,218	-	-	-	-	-	-	-	1,218
Short-Term / Total Debt	21	19	16	19	12	22	28	18	19
Data reported in billions of euro									
The table shows the maturity profile in % (yellow); the deficit in MREL TLAC instruments (light blue); the amount of senior debt suitable to be rolled-over (orange) the amount of MREL TLAC instruments to be meet entirely with new issuances (green) for each bank									

Banks' debt maturity profiles, total debt issuances, their breakdowns and average deficits in eligible instruments

5.3 Annex C

5-year CDS Senior mid-spreads from October 2008 until July 2017 Summary Statistics, using the observations 1 - 455

Variable	Mean	Median	S.D.	Min	Max
BBVA	0.0182	0.0136	0.0103	0.00567	0.0488
CAGR	0.0126	0.00985	0.00702	0.00313	0.0391
ING	0.0103	0.00860	0.00535	0.00230	0.0268
ISP	0.0177	0.0134	0.0119	0.00454	0.0618
NRD	0.00815	0.00705	0.00339	0.00205	0.0200
UNI	0.0206	0.0162	0.0121	0.00760	0.0678
iTraxx	0.0127	0.0107	0.00601	0.00519	0.0346
BSAN	0.0174	0.0137	0.00963	0.00500	0.0462

5-year CDS Subordinated Tier 2 mid-spreads from October 2008 until July 2017 Summary Statistics, using the observations 1 - 455

Variable	Mean	Median	S.D.	Min	Max
BBVA	0.0302	0.0256	0.0168	0.00850	0.0822
CAGR	0.0233	0.0172	0.0138	0.00820	0.0708
ING	0.0168	0.0139	0.00859	0.00471	0.0442
ISP	0.0297	0.0239	0.0179	0.00803	0.0961
NRD	0.0142	0.0130	0.00489	0.00654	0.0279
UNI	0.0362	0.0298	0.0193	0.0113	0.109
iTraxx	0.0227	0.0204	0.0101	0.00750	0.0604
BSAN	0.0284	0.0247	0.0146	0.00834	0.0719

5-year CDS difference in mid-spreads from October 2008 until July 2017 Summary Statistics, using the observations 1 - 455

Variable	Mean	Median	S.D.	Min	Max
BBVA	0.0121	0.0107	0.00738	0.00213	0.0345
CAGR	0.0107	0.00839	0.00721	0.00219	0.0333
ING	0.00647	0.00545	0.00359	0.00178	0.0205
ISP	0.0119	0.0103	0.00675	0.00232	0.0350
NRD	0.00609	0.00621	0.00207	0.00204	0.0116
UNI	0.0156	0.0146	0.00816	0.00261	0.0416
iTraxx	0.00996	0.00870	0.00465	0.00190	0.0257
BSAN	0.0110	0.0105	0.00587	0.00205	0.0269

The standard deviations marked in bold

5.4 Annex D

Sample Banks	Datotime	RegCapital%	NPLratio%	ROE%	StockReturn	StockVolatility	CDSbps
BBVA	2017	15,92	4,80	8,60	21,471	25,132	97,37
BBVA	2016	15,10	4,90	11,53	-1,834	38,643	135,91
BBVA	2015	15,00	5,40	8,30	-12,990	26,095	111,38
BBVA	2014	15,10	5,80	7,71	-6,180	24,918	88,45
BBVA	2013	14,90	6,80	2,59	28,685	28,190	41,26
BBVA	2012	13,00	5,10	4,68	6,580	36,495	105,58
BBVA	2011	12,90	4,00	9,41	-8,998	45,892	303,05
BBVA	2010	13,70	4,10	17,14	-38,324	45,343	198,50
BSAN	2017	17,75	3,55	7,97	18,749	23,458	98,60
BSAN	2016	14,68	3,93	10,48	9,903	40,919	133,01
BSAN	2015	14,40	4,36	9,67	-32,281	32,795	119,44
BSAN	2014	12,00	5,19	11,87	18,521	22,100	87,93
BSAN	2013	14,59	5,64	9,56	17,167	26,035	43,66
BSAN	2012	13,09	4,54	4,20	12,389	36,713	90,61
BSAN	2011	13,56	3,81	9,55	-23,907	39,564	239,41
BSAN	2010	13,10	3,55	14,86	-30,710	45,379	187,50
BPCE	2017	20,14	3,40	6,20	7,661	10,604	24,17
BPCE	2016	18,50	3,40	9,21	4,855	19,808	58,60
BPCE	2015	16,80	3,70	9,39	9,041	19,861	33,52
BPCE	2014	15,40	3,70	8,42	0,109	15,768	27,08
BPCE	2013	14,40	3,90	8,40	16,949	13,784	52,92
BPCE	2012	12,50	3,70	8,00	14,551	17,271	72,91
BPCE	2011	11,60	3,50	7,40	-16,979	28,632	198,65
BPCE	2010	11,60	3,50	8,10	-3,343	23,042	91,59
CAGR	2017	22,70	2,80	8,00	24,258	29,509	69,44
CAGR	2016	19,32	3,24	7,52	8,265	34,525	104,23
CAGR	2015	19,30	3,31	9,67	-0,183	31,472	80,53
CAGR	2014	18,37	3,30	8,46	18,858	29,523	80,13
CAGR	2013	16,30	3,40	9,37	50,018	29,581	50,84
CAGR	2012	14,00	3,20	-1,98	38,710	46,799	149,35
CAGR	2011	11,70	3,80	5,18	-54,394	62,780	310,00
CAGR	2010	11,70	3,60	8,56	-23,158	45,924	152,13
ING	2017	20,15	2,10	10,80	17,373	22,066	24,17
ING	2016	17,42	2,10	13,45	7,384	31,178	58,60
ING	2015	16,04	2,70	15,46	14,726	25,106	33,52
ING	2014	15,53	3,00	9,89	7,580	29,458	27,08
ING	2013	16,50	2,86	12,54	41,504	28,979	52,92
ING	2012	16,91	2,50	11,54	26,842	43,421	72,91
ING	2011	14,26	2,00	15,11	-23,680	55,105	198,65
ING	2010	15,30	1,50	9,47	5,504	46,517	91,59
NRD	2017	27,42	1,63	14,27	11,526	17,635	44,85
NRD	2016	24,70	1,63	14,27	8,567	25,171	66,08
NRD	2015	21,60	1,88	15,16	2,414	22,533	76,99
NRD	2014	20,70	2,02	14,36	6,546	17,275	53,22
NRD	2013	18,10	2,08	14,09	36,724	18,894	50,87
NRD	2012	16,20	0,91	14,59	16,593	23,255	70,23
NRD	2011	13,40	0,54	13,58	-27,275	36,021	86,53
NRD	2010	13,40	0,40	14,83	0,343	25,412	40,14
ISP	2017	19,27	3,80	6,50	17,997	31,094	153,10
ISP	2016	17,00	8,20	8,62	-21,482	41,983	141,04
ISP	2015	16,60	9,50	8,57	25,772	26,235	90,00
ISP	2014	17,20	10,47	6,57	35,534	29,515	91,40
ISP	2013	14,80	9,20	-10,67	38,150	37,631	37,92
ISP	2012	13,60	6,86	5,81	0,464	42,765	128,73
ISP	2011	14,30	6,00	-20,11	-32,132	59,854	340,44
ISP	2010	13,20	5,60	7,07	-35,676	41,467	202,41
UNI	2017	19,26	5,14	3,36	24,557	38,185	158,41
UNI	2016	11,66	9,60	3,36	-46,962	62,505	182,43
UNI	2015	14,23	9,90	3,98	-5,523	28,259	133,13
UNI	2014	13,41	10,10	6,69	0,000	31,641	124,10
UNI	2013	13,61	8,75	-31,83	45,402	36,450	46,84
UNI	2012	14,52	7,58	-12,69	-12,369	70,578	197,25
UNI	2011	12,37	3,42	-0,38	-58,838	58,657	380,04
UNI	2010	12,68	5,60	3,92	-30,876	42,034	239,12

Panel analysis data retrieved from Thomson Reuters and Financial Times Database

5.5 Annex E

Model 1: Pooled OLS, using 64 observations
 Included 4 cross-sectional units
 Time-series length = 16
 Dependent variable: Differences among 5-year CDS spreads in bps
 Durbin-Watson statistics marked in bold

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	63.0972	49.5434	1.274	0.2079	
Regulatory Capital	-1.96106	2.27931	-0.8604	0.3931	
NPLratio	-0.652111	2.75839	-0.2364	0.8139	
ROE	-0.900831	0.908838	-0.9912	0.3257	
Stock Returns	-1.44119	0.298746	-4.824	<0.0001	***
Stock Volatility	2.84216	0.606556	4.686	<0.0001	***
Mean dependent var	114.5697	S.D. dependent var		79.80485	
Sum squared resid	111574.4	S.E. of regression		43.85996	
R-squared	0.721923	Adjusted R-squared		0.697951	
F(5, 58)	30.11503	P-value(F)		5.95e-15	
Log-likelihood	-329.6461	Akaike criterion		671.2922	
Schwarz criterion	684.2455	Hannan-Quinn		676.3952	
rho	-0.120098	Durbin-Watson		2.040611	

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 22.0926

with p-value = $P(\text{Chi-square}(20) > 22.0926) = 0.335506$

RESET test for specification (squares only) -

Null hypothesis: specification is adequate

Test statistic: $F(1, 57) = 1.70717$

with p-value = $P(F(1, 57) > 1.70717) = 0.1966$

6 List of figures

Figure 1 - Two Diabolic Loops	6
Figure 2 - European Banking Union organisms and objectives	9
Figure 3 - Pillars' evolution between Basel II and III	12
Figure 4 - Main features of Capital Conservation and Countercyclical Buffers	16
Figure 5 - Additional Capital Buffers levels in different EU countries.....	17
Figure 6 - SREP 2016 new Pillar II requirement composition.....	19
Figure 7 - Capital structure of a bank under CRD IV – CRR and phase-in provisions	19
Figure 8 - Example of loss absorption and recapitalization in a bail-in	29
Figure 9 - Bail-in instruments hierarchy.....	32
Figure 10 - Setting of MREL requirements	34
Figure 11 - Internal and External MREL in UK.....	39
Figure 12 - BBVA debt structure breakdown.....	50
Figure 13 - MRELS ratios and regulatory thresholds graphical comparison.....	53
Figure 14 - MREL TLAC liabilities' deficit for each bank.....	54
Figure 15 - EUR financials yields mid YTM (BVAL); Maturity 5 years; rating AAA to B-..	56
Figure 16 - Historical paths of 5 years Senior (light blue) and subordinated (red) CDS weekly mid spreads from 24/10/2008 until 14/07/2017 expressed in basis points.....	60
Table 1 - MRELS / RWAs and TLOFs ratios in percentage points.....	51
Table 2 - CDS weighted averages spreads from July 2012 to July 2017	61
Table 3 - Debt restructuring costs for each bank and the aggregate sample value.....	62
Table 4 - Panel data analysis and diagnostics tests	66

7 References

- Achterberg, E. and Heintz, H. (2012) *Basel III summary*.
- Allen and Overy (2014a) *Capital Requirements Directive IV Framework Capital and Capital Adequacy*.
- Allen and Overy (2014b) *Capital Requirements Directive IV Framework Capital Buffers*.
- Ashurst London (2015) *The BRRD , the Stay Protocol and the impact on derivatives*.
- Association for Financial Markets in Europe (2014) *Risk adjustment of contributions to resolution funds and DGS*.
- Associazioni Italiana degli Analisti e Consulenti Finanziari (2017) *BRRD e Bail-in Implicazioni per l'analisi del settore finanziario e la tutela dell'Investitore*.
- Bank for International Settlements (2014) *Basel III Leverage ratio framework and disclosure requirements*. Available at: <http://www.bis.org/publ/bcbs270.pdf>.
- Bank for International Settlements (2015) *Summary of Findings from the TLAC Impact Assessment Studies*.
- Bank of England (2012) *Financial Stability Report*. Available at: <http://www.bankofengland.co.uk/publications/Documents/fsr/2017/fsrspnote270617.pdf%0A> http://www.snb.ch/en/i/about/pub/oecpub/id/pub_oecpub_stabrep.
- Bank of England (2016a) *The Bank of England's approach to setting a minimum requirement for own funds and eligible liabilities (MREL) Responses to Consultation and Statement of Policy*.
- Bank of England (2016b) *The FSB 's TLAC standard and the EU 's MREL provisions : UK implementation*.
- Bank of Italy (2016a) *Finacial Stability Report*.
- Bank of Italy (2016b) *Information on resolution of Banca Marche , Banca Popolare dell ' Etruria e del Lazio , Cassa di Risparmio di Chieti , and Cassa di Risparmio di Ferrara crises*.
- Bank of Italy (2016c) *The 'precautionary recapitalization' of Banca Monte dei Paschi di Siena*.
- Bank of Italy (2017) *Informazioni sulla soluzione della crisi di Veneto Banca S.p.A. e Banca Popolare di Vicenza S.p.A.*
- Basel Committee on Banking Supervision (2010) *Assessing the Macroeconomic Impact of the Transition to Stronger Capital and Liquidity*. Available at: <http://www.bis.org/publ/othp12.htm> Macroeconomic.
- BBVA Research (2014) *The European MREL: main characteristics and TLAC similarities and differences*.
- BBVA Research (2016) *New requirements for loss absorbing capacity : TLAC and MREL*.
- Beau, E. and J. H. and T. H. (2014) *Bank funding costs: what are they, what determines them and why do they matter?*
- Caporin, M., Ravazzolo, F. and Natvik, G. J. (2017) *The Bank-Sovereign Nexus : Evidence from a non-Bailout Episode*.

- Cipriani, M. *et al.* (2014) *Gates, Fees, and Preemptive Runs*. Available at: <http://www.ssrn.com/abstract=2423396>.
- CommerzBank Research (2016) *European Banks: A primer on MREL and TLAC*.
- Coudert, V. and Gex, M. (2010) *Credit default swap and bond markets : which leads the other ?*
- Deloitte (2015) *Aiming at resolvability: The Single Resolution Board*.
- Deutsche Bundesbank (2016) *Bank recovery and resolution – the new TLAC and MREL minimum requirements*.
- Economic Governance Support Unit (2016) *Global Systemically Important Banks in Europe*. Available at: [http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/574406/IPOL_BRI\(2016\)574406_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/574406/IPOL_BRI(2016)574406_EN.pdf).
- European Banking Authority *Single Rulebook*. Retrieved from <http://www.eba.europa.eu/regulation-and-policy/single-rulebook>.
- European Banking Authority (2014) *Guidelines on common procedures and methodologies for the supervisory review and evaluation process (SREP)*.
- European Banking Authority (2015a) *EBA FINAL draft Regulatory Technical Standards on criteria for determining the minimum requirement for own funds and eligible liabilities under Directive 2014/59/EU*.
- European Banking Authority (2015b) *Guidelines on triggers for use of early intervention measures pursuant to Article 27(4) of Directive 2014/59/EU*.
- European Banking Authority (2015c) *Guidelines on the minimum list of qualitative and quantitative recovery plan indicators*
- European Banking Authority (2016a) *Final Report on MREL*. Available at: [https://www.eba.europa.eu/documents/10180/1695288/EBA+Final+MREL+Report+\(EBA-Op-2016-21\).pdf](https://www.eba.europa.eu/documents/10180/1695288/EBA+Final+MREL+Report+(EBA-Op-2016-21).pdf).
- European Banking Authority (2016b) *How to ensure enough Loss Absorbing Capacity : From TLAC to MREL*.
- European Banking Authority (2016c) *MREL REPORT: Frequently Asked Questions*.
- European Banking Authority (2017) *Draft Implementing Technical Standards on procedures and templates for the identification and transmission of information by resolution authorities to the EBA, on minimum requirements for own funds and eligible liabilities*.
- European Central Bank *Joint Supervisory Team*. Retrieved from <https://www.bankingsupervision.europa.eu/banking/approach/jst/html/index.en.html>.
- European Commission (2011) *Establishing a framework for the recovery and resolution of credit institutions and investment firms*. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/19097363>.
- European Commission (2014a) *Economic Review of the Financial Regulation Agenda*
- European Commission (2014b) *EU Bank Recovery and Resolution Directive (BRRD): Frequently Asked Questions*. Available at: www.pwc.com/financialregulation.

- European Commission (2015) *The Five Presidents' Report: Completing Europe's Economic and Monetary Union*.
- European Commission (2016a) *EU Banking Reform : Strong banks to support growth and restore confidence*.
- European Commission (2016b) *Frequently Asked Questions : Capital requirements (CRR/CRD IV) and resolution framework (BRRD / SRM) amendments*.
- European Commission (2016c) *Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013*.
- European Parliament (2016) *Loss absorbing capacity in the Banking Union : TLAC implementation and MREL review*.
- European Systemic Risk Board (2016) *Bail-in expectations for European banks: Actions speak louder than words*.
- European Union (2010) *REGULATION (EU) No 407/2010 of the European Parliament and of the Council, Official Journal of the European Union*.
- European Union (2012) *Treaty on European Union and the treaty on the functioning of the Europe Union, Official Journal of the European Union*.
- European Union (2013a) *DIRECTIVE 2013/36/EU of the European Parliament and of the Council, Official Journal of the European Union*.
- European Union (2013b) *REGULATION (EU) No 575/2013 of the European Parliament and of the Council, Official Journal of the European Union*.
- European Union (2014a) *DIRECTIVE 2014/59/EU of the European Parliament and of the Council, Official Journal of the European Union*. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0059&from=IT>.
- European Union (2014b) *REGULATION (EU) No 806/2014 of the European Parliament and of the Council, Official Journal of the European Union*.
- Federal Reserve Bank of New York (2014) *Large and Complex Banks*.
- Financial Stability Board (2013) *Recovery and Resolution Planning for Systemically Important Financial Institutions: Guidance on Developing Effective Resolution Strategies*.
- Financial Stability Board (2016) *2015 of List of Global Systemically Important Banks*.
- Finance Trainer (2015) *Fully loaded Equity – the challenge in the total bank management*.
- Finance Watch (2016) *TLAC/MREL: Making failure possible?*
- Financial Stability Board (2015) *Principles on Loss-absorbing and Recapitalisation Capacity of G-SIBs in Resolution*. Available at: <http://www.financialstabilityboard.org/wp-content/uploads/TLAC-Principles-and-Term-Sheet-for-publication-final.pdf>.
- Fonseca, J. Da and Gottschalk, K. (2015) *The Co-movement of Credit Default Swap Spreads, Stock Market Returns and Volatilities: Evidence from Asia-Pacific Markets*. Available at: http://asianfa2012.mcu.edu.tw/fullpaper_tfa%5C10135.pdf.
- Fumagalli, M. (2015) *Bail - in e clausola di depositor preference estesa : quali tutele per i depositi ?*
- Gatti, A. M. (2016) *Challenges and prospects of the new banking resolution regime*.

- Goodhart, C. and Avgouleas, E. (2014) *A Critical Evaluation of Bail-ins as Bank Recapitalisation Mechanisms A Critical Evaluation of Bail-ins as Bank*. Available at: www.cepr.org/pubs/dps/DP10065.php.
- International Center for Monetary and Banking Studies (2017) *Bail-ins and Bank Resolution in Europe*.
- KPMG (2017) *Single Resolution Board : Contrasting outcomes for banks SRB : Contrasting outcomes for banks*.
- Lambert, P. (2016) *Understanding the Role of Bank Capital Buffers Understanding the Role of Bank Capital Buffers Understanding the Role of Bank Capital Buffers*.
- Lambert, P., Villalobos, J. and Theodore, S. (2014) *AT1 Capital Instruments Background and key risks for investors*.
- Linklaters (2016) *Senior Non - Preferred Notes French law aspects*.
- Mayes, D. G. (2014) *The Funding of Bank Resolution*.
- Morrison and Foester (2015) *BRRD and Bail-in*.
- Morrison and Foester (2016) *Shaping MREL for European (and non-European) Banks*.
- Parigi, B. M. (2017) *National and supranational banking regulators: between delayed intervention and time inconsistency*.
- Po', L. (2014) *I nuovi strumenti ibridi di capitale tra implicazioni regolamentari e questioni di diritto societario*.
- Popovic, H. S. and I. (2013) *Estimating the Cost of Debt*. Available at: <http://ssrn.com/paper=254974>.
- PricewaterhouseCoopers (2011) *Risk and Capital Management under Basel III*.
- Single Resolution Board (2016) *Guidance to the completion of the SRB's liability data template for 2016*.
- Single Resolution Board (2017) *MREL: Approach taken in 2016 and next steps*. Available at: https://srb.europa.eu/sites/srbsite/files/srb_mrel_approach_2016_post_final.pdf
- Swedish National Debt Office (2017) *Decision memorandum Application of the minimum requirement for own funds and eligible liabilities*.
- Troiano, V. and Consoli, G. (2017) *The impact of the bail - in on banking services and bank funding*.
- UniCredit Research (2016a) *BANK BONDS : REGULATORY ISSUES*.
- UniCredit Research (2016b) *BANKING REGULATION*.
- UniCredit Research (2017) *Non-preferred senior bonds compared to the HoldCo / OpCo approach*.
- White, P. and Yorulmazer, T. (2014) *Bank Resolution Concepts, Tradeoffs, and Changes in Practices, Federal Reserve Bank of New York Economic Policy Review*.

World Bank Group (2016a) *Bank resolution and bail-in in the EU : selected case studies pre and post BRRD*. Available at:
<http://documents.worldbank.org/curated/en/731351485375133455/Bank-resolution-and-bail-in-in-the-EU-selected-case-studies-pre-and-post-BRRD>.

World Bank Group (2016b) *MREL and TLAC – A Market Perspective*.

World Bank Group (2016c) *Understanding Bank Recovery and Resolution in the EU : A Guidebook to the BRRD*.