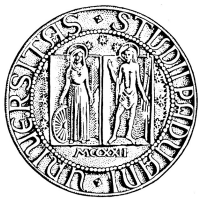


UNIVERSITA' DEGLI STUDI DI PADOVA

DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI "M.FANNO"

CORSO DI LAUREA MAGISTRALE IN BUSINESS ADMINISTRATION

TESI DI LAUREA

"MARKET AND BOOK VALUE IN THE EURO AREA BANKING SYSTEM"

RELATORE:

CH.MO PROF. FRANCESCO ZEN

LAUREANDA: MICHAELA INTERMITE

MATRICOLA N. 1080580

ANNO ACCADEMICO 2015 – 2016

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

Regulators' traditional definition of banking activity distinguishes banks from other financial institutions and from industrial firms by highlighting the presence of a *public interest* in their core business that has to be safeguarded. Due to the fact that they operate as intermediaries between borrowers and savers, providing liquidity to the whole economic system, banks assume a prominent role on international economics development. Nonetheless, banks are part of a wider financial system, which continues to grow, driven by financial engineering and its structured financial instruments. The recent financial crisis showed how these instruments could function as transmission mechanisms spreading the negative effects all over the world. It is for this reason that regulators and supervisors are continually involved in the assessment of banks' soundness and financial robustness. Moreover, although there have been some attempts to harmonize banks' financial statements, these lasts are still less transparent then those of industrial firms considering that the largest part of banks' assets and liabilities are composed of financial instruments, whose measurement depends on market values and complex evaluation methods. Even if international accounting standards require banks to provide an exhaustive disclosure of such information, financial statements users still have to trust on banks' risk management processes and evaluation techniques.

In this context, *value relevance* studies become particularly interesting. These studies aim to assess the presence of a significant relation between an accounting measure and company's share prices. If such relation exists, the Academic literature defines the accounting measure as *value relevant.*

This thesis is an attempt to enhance the existing literature by providing two different analyses: The first verifies if and in which measure the market value of a bank, measured by Market-to-book ratio, follows the trend of some bank's characteristics, such as profitability, efficiency, riskiness, business activity and capital adequacy. The second analysis differs from the first one because it aims to determine which of those characteristics are reflected on changes in share prices. Both analyses consider Euro-Area commercial and cooperative banks publicly listed during the period between 2006 and 2014.

The work is organized in four chapters.

The first chapter has two different objectives: first of all, it intends to draft an overview of the Euro Area banking system, with particular regard to reforms that regulators have adopted in response to threats and weaknesses arisen during the last financial crisis. Some of the peculiar aspects covered in this part attains: the consequences of the banking crisis and the provision of a European System of Financial Supervisors, as it has been proposed by the de Larosière group in 2009; the Euro-Area sovereign debt crisis that followed the banking crisis and highlights the importance of a *banking union* in order to complete the European monetary and economic union. The second object of this chapter is to give an overview of the impact that the introduction of international accounting standards have had on banks' financial statements with special attention to managerial consequences linked to the adoption of *fair value* and *amortized costs* evaluation methods.

In the second chapter, a literature review is presented. Particularly, the chapter starts introducing the concept of "*value relevance"* focusing on authors that clarify, criticize and discuss about the significance of such studies. Subsequently, articles that focus on the banking sector are reported with researches that, considering one single issue over time, try to provide evidence of the value relevance of fair value estimate, capital structure, diversification, rating changes and IFRS adoption. Finally the chapter contains articles in which banks' Market-to-Book ratio and banks' stocks returns are regressed with different financial statement ratios. These latter are the studies that most of all approach the empirical analyses conducted in the last two chapters of this work.

The third chapter aims to assess the presence of a correlation between banks' Market-to-Book ratio and different financial and accounting ratios. First of all are described the procedures followed in building up the sample and its peculiarities; financial ratios included in the model and the econometric methods used to develop the analysis. Then the chapter proceeds in exposing Fixed Effects regression findings and some heteroskedasticity controls.

Market-to-book ratio analysis is one of the two possibilities, recognized by Barth, Beaver and Landsman in 2001, through which it could be assessed the value relevance of banks' financial statements. The other one tries to determine what is reflected on changes in share prices over a specific period of time. This latter is analysed in the last chapter, following the structure of the previous one: first of all it describes the changes adopted in the sample and its new peculiarities; how financial ratios have been modified and the econometric methods used to develop the analysis. Finally, it focuses on Fixed Effects regression findings.

Last but not least, in the conclusions empirical results of the two analyses are compared to the ones obtained by authors in previous works of the literature; moreover, the main limits of the work are presented together with some proposals for further developments.

Chapter I
The Euro Area Banking System

Article 4 of EU Regulation No. 575/2013 defines a bank as "an undertaking the business of which is to take deposits or other repayable funds from the public and to grant credits for its own account". In this way, banks are defined as the joining link, *the intermediary*, between borrowers and savers, offering liquidity as a service. Taken together, these two businesses are the key element that distinguishes banks from all other types of financial firms and that determines banks' prominent role on financial and economic systems. The *public element* recognized in banks' services explains why banks, differently from all other firms, are subject to prudential regulation and are constantly in the centre of public debates. This study focus on these specific companies and in particular it refers to the ones established in the Euro Area. The empirical models developed in the following chapters are aimed to provide evidence of the value relevance of banks' financial statements considering the time period between 2006 and 2014.

This preparatory chapter concentrates on two main issues: considering the peculiarity of the nine years in the analyses, the first paragraph describes all the weaknesses and threats arisen during the financial crisis giving also a review of the reforms that bank's regulators have adopted in response to such problems. The second paragraph is an overview of the impact that the introduction of international accounting standards have had on the reduction of banks' financial statements with special attention to the managerial consequences of the adoption of *fair value* method for financial instrument measurement.

1.1. Regulatory and supervisory framework

On the 1st January 1999 eleven European Union member states[1] agreed on the creation of a monetary union, the Euro-Area, for the adoption of a single currency, the Euro that officially entered into circulation on the 1st January 2002.

[1] *During the years, other EU member states joined the Eurozone until it the reaches the actual nineteen members: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain.*

Simultaneously to the creation of the Euro Area, the central banks of the founder countries (National Central Banks – NCBs) agreed to transfer their powers and responsibility for monetary policy decision-making to a new supranational institution, the European Central Bank, with which they compose the European System of Central Banks. As it has been lead down by the Treaty for the Functioning of the European Union (the Treaty) the primary objective of the ESCB shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union. The ESCB shall act in accordance with the principle of an open market economy with free competition, favoring an efficient allocation of resources. The Treaty also defines that the basic tasks to be carried out through the ESCB shall be: (i) to define and implement the monetary policy of the Union; (ii) to conduct foreign-exchange operations; (iii) to hold and manage the official foreign reserves of the Member States; (iv) to promote the smooth operation of payment systems.

Furthermore, in the Euro Area the European Central Bank is the sole issuer of banknotes and bank reserves. In other words, National Central Banks confers to the ECB the role of monopoly supplier of the monetary base so as to enable it to influence money market conditions and steer short-term interest rates.

1.1.1. From the Banking Crisis to the ESFS

In the middle of 2007, the burst of the U.S. banking crisis showed all the vulnerabilities and instabilities that characterize the system. Before of the eruption of the crisis, no one seemed to be conscious of the dangers linked to the credit expansion that was being favoured by low interest rates, increasing housing prices and regulators' failures. Financial engineering made the rest: *investment banks*[2] began to buy loans from *commercial banks*[3] that, in this way, reduced the capital amount required by regulators, gaining at the same time from the sales. Once having bought loans, investment banks gained from the issuance of MBSs (Mortgage Backed Securities) obtained by pooling and tranching loans together. MBSs were then pooled into CDOs (Collateralized Debt Obligations) and this latter in synthetic CDOs.

---

[2] *Investment banks offer services such as underwriting, advice on Merger & Acquisitions, trading, asset management and global custody. They contribute to increased liquidity in the system by arranging new forms of finance for corporations, but this is quite different from meeting the liquidity demands of depositors for this reason, the term "bank" may be a misnomer.*

[3] *Commercial banks offer intermediary, liquidity and payments services to corporations and governments (wholesale services) as well as to banking customers and small businesses (retail services).*

Moreover, derivatives market created other instruments liked to previous ones: CDSs (Credit Default Swaps), a form of insurance contracts, which provide protection against the default of MBSs and CDOs. This machine could not work without Credit Rating Agencies that assigned rating: (i) assuming that securitization (the process of pooling and tranching loans) creates safe financial products by diversifying risks; (ii) basing CDOs rating on the one that they assigned on the underlying collateral. In this ways, all those derivative instruments obtained a high rating (triple-A) even when they were composed of subprime loans[4]; this in turn ensured the presence of a liquid market for these instruments. This self-fulfilling mechanism implemented itself until housing prices continued to increase: When the housing bubble exploded, the losses reached all the members of the chain, all over the world. High-leveraged financial institutions, if not rescued by government, failed and panic spread out.[5]

As de Larosière Group[6] (2009) report, when it was already clear that the U.S. banking crisis reached all other countries, EU supervisors started to face some difficulties in assessing how subprime exposures entered into EU financial institutions and recognizing EU financial institutions' degree of exposures in illiquid financial assets. Moreover, the European Union was not prepared for the crisis, with inadequate crisis management infrastructures that were not able to ensure cooperation between national supervisors and between public authorities. The first European Central Bank's reaction was to provide liquidity in the inter-bank market while Member States' public authorities were trying to avoid larger financial institutions failures. Nonetheless, due to the inadequacy of the infrastructures, the results were only negative consequences among Member States. The group underlines that "the interaction of market failures, financial and monetary imbalances, inappropriate regulation, weak supervision and poor macro-prudential oversight" leaded to the financial crisis and these problems could not be resolved only by increasing in *regulation*. If this is the set of rules that govern financial institution, the *supervision,* that ensures their implementation. Supervision is distinguished in: (i) micro-prudential, on individual financial institutions with the aim of

---

[4] *A loan is classified as "subprime" when it is granted to borrowers that cannot be classified as "ordinary" because of their bad credit history. For this reason, this kind of loans are characterized by higher interest rates and higher degree of risk.*

[5] *This paragraph is an elaboration of United States Financial Crisis Inquiry Commission (2011)*

[6] *In October 2008, the President of the European Commission, J.M. Barroso mandated J. De Larosière to chair a High-Level Group with the aim to give advice of regulation and supervision changes to be adopted in order to restore the equilibrium in the European Union and to avoid future financial crises and contagion risks. The High-Level Group was composed of: L. Balcerowicz, O. Issing, R. Masera, C. Mc Carthy, L. Nyberg, J. Pérez and O. Ruding.*

limiting their distress, preventing in these way contagion risk; and (ii) macro-prudential supervision that aim to protect the financial system as a whole. Although these two area are separated and they are in trust of different bodies, they are strongly interconnected: macro-supervision cannot be effective if it cannot impact on supervision at micro-level as well as the micro-prudential supervision is meaningless without taking into account macro-prudential development.

The report recommended European institutions to create two institutions in charge of macro and micro prudential supervision:

i. The *European Systemic Risk Council – ESRC*, in charge of the macro-prudential supervision, which is asked to "issue risk warnings, compare observations on macro-economic and prudential developments and give direction on these issues" de Larosière Group (2009). As the macro-prudential regulation should be allocated to the ECB and to the ESCB, this council should be composed of the members of the ESCB General Council (the President and the vice-president of the ECB, and Governors of the Member State central banks), the Chairpersons of CEBS, CEIOPS and CESR[7] and by one representative of the European Commission. Moreover, the ECB President would be the chair of the ESRC. Finally, the de Larosière Group provided for the inclusion of insurance and securities supervisors every time that the subject of discussion justifies their presence.

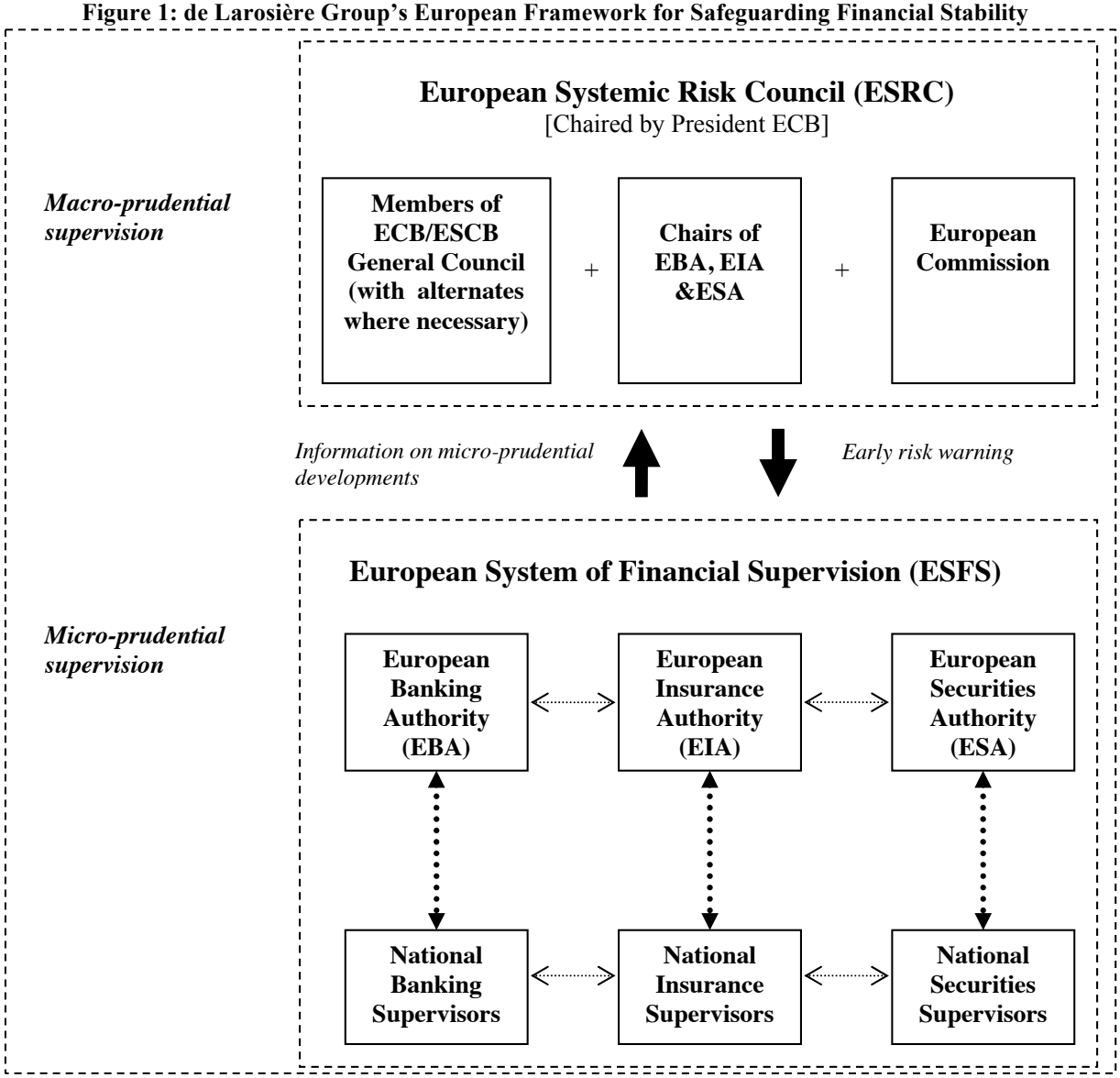
ii. The *European System of Financial Supervision – ESFS* with micro-prudential supervision powers. This system should be introduced in order to reform the three existing committees (CEBS, CEIOPS and CESR), whose structures did not appear to be sufficient to ensure stability in the EU. Therefore, de Larosière group suggested to set up three independent Authorities (European Banking Authority, European Insurance Authority and the European Security Authority) responsible for: (i) the coordination of the application of supervisory standards, and (ii) the guarantee of strong cooperation between the national supervisors. The creation of the ESFS should follow a two steps process: in the first, between 2009 and 2010, national supervisory authorities should be strengthened in order to upward overall EU supervisory, the European Commission should start to prepare the legal proposal for the introduction of the three Authorities while the

[7] *Committees of European Supervision for: banks, insurance and occupational pensions and securities.*

three Committee should be immediately reinforced by more budget in order to upgrade the quality of their evaluation process moreover, in the first stage the EU should develop a more harmonized set of regulations. The second stage, between 2011 and 2012, attains the effective implementation of the ESFS, with the establishment of the three Authorities.

Figure 1 shows the architecture of the "European Framework for the Safeguarding of Financial Stability" as defined by the de Larosière Group (2009).

Figure 1: de Larosière Group's European Framework for Safeguarding Financial Stability



Source: de Larosière Group, 2009, p. 57.

The de Larosière Group's recommendations have been accepted by the European Commission that the 4th March 2009, in a communication entitled "Driving European Recovery" proposed to the European Council an ambitious reform program that aim to: (i) introduce in the EU a supervisory framework composed of a European Body for the Financial Supervision of the system as a whole and a European Financial Supervision System for the

micro-prudential activities; (ii) a set of regulations regarding hedge funds, private equity, tools for the intervention in case of crisis, derivative instruments, capital requirements and supervisory rules; (iii) measures to reinforce investors and consumers confidence; (iv) improve risk management; and (v) ensure more effective sanctions for market abuse (European Commission, COM/2009/0114 final).

The European Financial Supervision Package has been presented, at the end of May 2009, to the European Council that in its meeting of 18th and 19th June 2009 welcomed the Commission's proposals as well as the "Commission's intention to bring forward, by early autumn 2009 at the latest, the legislative proposals to put in place the new framework for EU supervision" (Council of the European Union, 11225/2/09).

The *European System of Financial Supervision – ESFS* was implemented in the autumn 2010 through a set of European Union Regulations. Differently from the suggestions of the de Larosière Group (2009), the ESFS comprises all the independent and interdependent organizations whose mission is the supervision of the Union's Financial System. For this purpose, it is composed of the European Financial Stability Board for the macro-prudential supervision; the three European Supervisory Authorities (ESAs) for the micro-prudential supervision, the Joint Committee of the European Supervisory Authorities and the competent or supervisory authorities of the Member States.

The *European Financial Stability Board*[8], with seat in Frankfurt am Main, pursues objectives linked to macro-prudential supervision, preventing and mitigating systemic risk that could compromise the financial stability of the Union. To this aim the EFSB determines, collects and analyzes information in order to identify systemic risks. If these risks are significant, it issues warnings and recommendations and when those risks may end in an emergency situation, ESRB issues a confidential warning to the European Council that in this way could adopt decisions addressed to ESAs. The ESRB has also to: (i) monitor the follow-up of issued warnings, (ii) cooperate closely with ESAs in particular for the developing qualitative and quantitative indicators for the identification of systemic risks; (iii) participate in the Joint Committee and (iv) coordinate actions with international financial organizations as the International Monetary Funds and the Financial Stability Board.

Article 4 of the Regulation (EU) No 1092/2010 defines the structure of the ESRB that shall comprise: a General Board, that takes necessary decisions for the performance of ESRB tasks; a Steering Committee, that prepares General Board meeting and assists in the decision

[8] *Regulation (EU) No 1092/2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board*

process; a Secretariat, responsible for the day-to-day business; an Advisory Scientific Committee and an Advisory Technical Committee. As suggested by the de Larosière Group (2009), the EFSB is chaired by the President of the ECB and it has two vice-chairs: the first elected by the General Council and the second that is the chair of the Joint Committee. Moreover, the General Council is composed of the President and the Vice President of the ECB, the Governors of national central banks, a Member of the commission, the chairpersons of the three ESAs, the chair and the vice-chair of the Advisory Scientific Committee and the chair of the Advisory Technical Committee.

The three European Supervisory Authorities are: The European Banking Authority, the European Insurance and Occupational Pensions Authority and the European Securities and Market Authority. These three Authorities are designated to the micro-prudential supervision so as to guarantee the short, medium and long-term effectiveness of the financial system and contributing to improving the functioning of financial markets, ensuring their integrity and transparency, preventing regulatory arbitrage, ensuring that the credit is appropriately regulated and supervised and enhancing consumer protection.[9]

The *European Banking Authority*[10] is defined as a Union Body with legal personality and has its seat in London. Article 1 of the Regulation (EU) No 1093/2010 establishes that the Authority supervises activities of credit institutions, financial conglomerates, investment firms, payment institutions and e-money institutions and that the "Authority shall pay particular attention to any systemic risk posed by financial institutions, the failure of which may impair the operation of the financial system or the real economy". Moreover, it establishes that in each of its tasks the Authority shall act wit independence and impartiality in the interest of the Union.

In order to allow the Authority to achieve its tasks the Article 8 expressly confers to the EBA the power to: (i) develop draft regulatory technical standards; (ii) issue guidelines and recommendations; (iii) take individual decision addressed to competent authorities or to financial institutions in emergency situations and in cases concerning directly applicable Union Law. Additionally, this article provides that the EBA shall:

---

[9] *Article 1 of Regulation (EU) No 1093/2010; Article 1 of Regulation (EU) No 1094/2010 and Article 1 of Regulation (EU) No 1095/2010.*

[10] *Regulation (EU) No 1093/2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC. As will be clarified in next pages this Regulation has been amended by the Regulation (EU) No 1022/2013 as regards the conferral of specific tasks on the European Central Bank.*

"(g) Issue opinions to the European Parliament, the Council, or the Commission […];

(h) Collect the necessary information concerning financial institutions […];

(i) Develop common methodologies for assessing the effect of product characteristics and distribution processes on the financial position of institutions and on consumer protection;

(j) Provide a centrally accessible database of registered financial institutions in the area of its competence […];" Regulation EU No. 1093/2010, art. 8.

Nevertheless, the EBA has tasks related to customer protection and financial activities (art. 9). The article 6 lists the component of the EBA: (i) a Board of Supervisors, that guides EBA's works and that is the place of the decision making process; (ii) a Management Board, that ensures that the EBA achieves its mission and performs its tasks; (iii) a chairperson, that: represents the Authority, is responsible for the decisions and chairs the meetings of the two previous boards; (iv) an Executive Director, which manages the Authority and (v) a Board of Appeal, in common with the other two ESAs, to which any natural or legal person can appeal against Authorities' decisions.

Considering the Board of Supervisors, article 40 clarifies that it is composed of:

"(a) the Chairperson, who shall be non-voting;

(b) the head of the national public authority competent for the supervision of credit institutions in each Member State, who shall meet in person at least twice a year;

(c) one representative of the Commission, who shall be non-voting;

(d) one representative of the European Central Bank, who shall be non-voting;

(e) one representative of the ESRB, who shall be non-voting;

(f) one representative of each of the other two European Supervisory Authorities, who shall be non-voting." Regulation EU No. 1093/2010, art. 40.

Article 45 attains the Management Board composition, stabilizing that it consists of a Chairperson and six members of the Board of Supervisors.

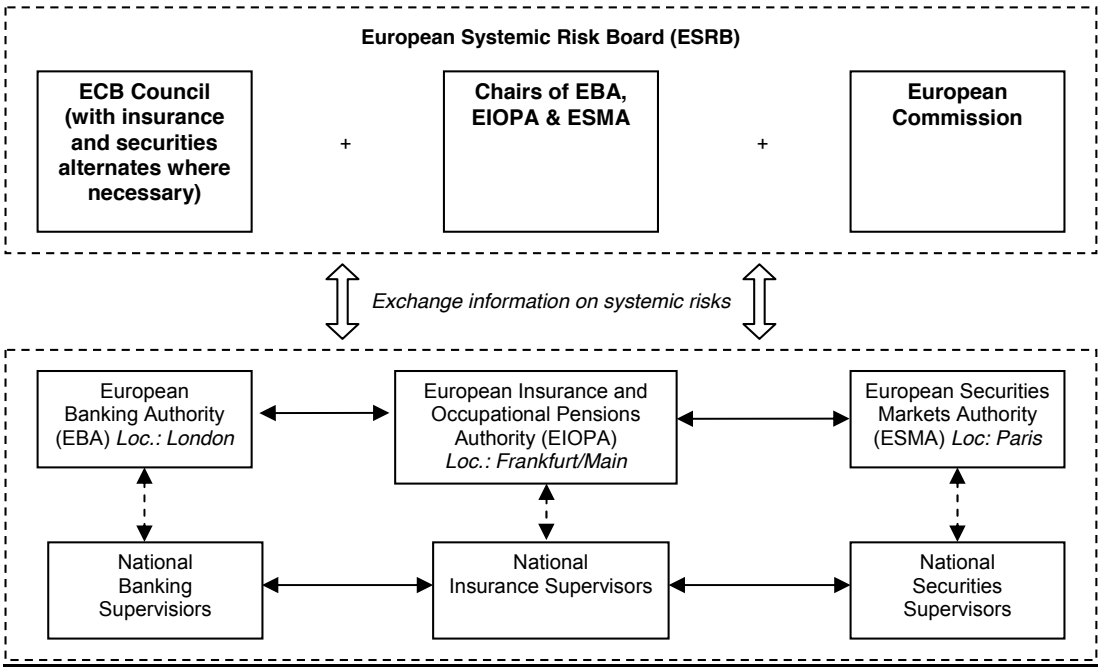
The *European Insurance and Occupational Pensions Authority*[11] is located in Frankfurt am Main and, as EBA, it is a Union Body with legal personality. Article 1 of Regulation (EU) No 1094/2010 expressly lists the institutions subject to the EIOPA's supervision: insurance undertakings, reinsurance undertakings, insurance intermediaries and institutions for occupational retirement provision. With regards to the latter, the article also clarifies that the authority operates without "prejudice to national social and labour law". The Authorities has the same tasks, powers and compositions of EBA.

[11] *Regulation (EU) No 1094/2010 establishing a European Supervisory Authority (European Insurance and Occupational Pensions Authority)*

The *European Securities and Market Authority*[12] as the two previous ones is a Union Body with legal personality whose seat is located in Paris. As for the other two, the first article of the establishing regulation enunciates that ESMA supervises: firms providing investment services or to collective investment undertakings marketing their units or shares and the competent authorities that supervise them. Moreover, the Authority can take action in the context of take-over bids, clearing and settlement and derivative issues. It has the same mission, tasks and composition of the other two ESAs.

Figure 2 shows the architecture of the European System of Financial Supervision as it has been implemented in the Union.

Figure 2 European System of Financial Supervision



Source: European Commission Memo/10/434 p.2

1.1.2. Towards a Banking Union

In the autumn 2009, while the European Commission was committed in putting in place the legislative proposals for the establishment of the new European System of Financial Supervision, the Greek government presented a deficit budget much higher than the forecasted one[13]. Bond investors negatively reacted to this notice and the Euro-Area

---

[12] *Regulation (EU) No 1095/2010 establishing a European Supervisory Authority (European Securities and Markets Authority)*

[13] *The Greek government announced in November 2009 a deficit of about the 12,8% of GDP rather than the 3,6%. Chang and Leblond (2015)*

Sovereign Debt crisis began[14]. The Greek government's proposals to reduce the deficit at the nine percent of GDP was not enough for both bond investors and credit rating agencies; the latter decreased Greek's rating to the "junk" status by April 2010. This emergency situation could end-up in three possible way: (i) the rest of the Eurozone helps the Member State by guarantying its debt; (ii) the Member State starts a fiscal and economic reform program, imposing austerity in order to restore its public finance status; (iii) the Member State leaves the Euro-area. This last scenario could be particularly dangerous for the entire monetary union due to the risk of contagion for other Member States (Chang and Leblond, 2015).

Although tension increased significantly after the European Commission's confirmation of the poorness and inadequacy of financial and fiscal data provided by Greek governments, Member States agreed to the rescue of the State and proceeded with its bailout in May. Few days after, following the EU Council of Economic and Financial Affairs, a temporary rescue mechanism was launched in May 2010: the European Financial Stability Facility[15]. This special purpose vehicle was created to help Euro Area Member States in order to safeguard financial stability of the entire system with a lending capacity up to euro 440 billion.

The Greek bailout was not an isolated event: the second country that received funds was Ireland in the autumn 2010. Differently from Greek, whose fiscal deficit became unsustainable because of scarce competitiveness of its economy, Ireland's public debt crisis was due to the attempt of the government to bail out the failing banks hit by the banking crisis.

Following the rating downgrade of the main Portugal's banks as well as the downgrade of its public debt, even this last State required financial assistance, just few months before that the interest rates on Ireland debt began to decrease and that a new financial assistance package for Greek was proposed, both in July 2011.

The banking crisis reached also Spain's regional savings banks so that the public debt of the country increased by more than doubling itself and the ten years interest rates start to increase in November 2010 as well as Italy's ones. Things get worse with the exacerbating of the crisis and Spain accepted EU funds in 2012 to recapitalize the banking system.

---

[14] *The reconstruction of debt crisis facts follows the work of Chang and Leblond (2015).*

[15] *The EFSF, whose main shareholders are the Euro Area Member States, has been conceived as a temporary rescue mechanism to be replaced in 2013 by the European Stability Mechanism.*

Despite of these rescue programs, yields did not decrease until that European Central Bank's President, Mario Draghi, promised to do "whatever it takes"[16] to preserve the Euro Area stability. As a matter of fact, it was the Euro-Area instability the common driver of the crisis as Chang and Lebond (2015, p. 645) state:

> "Despite the different origins of the Greek, Irish, Portuguese and Spanish crises […] they share their vulnerability owing to the contagion that arose as a result of investors questioning the euro area's integrity. While economic fundamentals and the degree of political difficulties in implementing reforms varied, the key factor in calming down market expectations rested with the assurance of the euro area's integrity".

Structural shortcomings coming from the financial crisis and the deep interdependences among member states have been indicated by the president of the European Council H. Van Rumpoy as the reasons for which the Euro Area Monetary Union needs an *integrated financial framework* composed of: (i) a single European banking supervision and (ii) a common deposit insurance and resolution framework (President of the European Council, EUCO 120/2012). The Euro Area Summit in June 2012 again reaffirmed the urgency "to break the vicious circle between banks and public debts" and asked the European Council to consider the proposal for the establishment of a single supervisory mechanism. The aim was to complete the monetary and economic union by the introduction of a *"banking union"*.

In September 2012, the European Commission presented a communication for the European Parliament and the European Council concerning the steps to follow in order to reach the banking union. In this communication the European Commission clarified that the banking union is a reinforcing process of the "single market"[17] since that the regulatory reforms program for the single market, i.e. the *single rulebook*, would be also the foundation of the banking union. Moreover, the European Commission identified three areas particularly relevant for the banking union, in which the single market legislative process would be accelerated that are: (i) banks capital requirement; (ii) deposit guarantee schemes and (iii) bank recovery and resolution processes.

---

[16] *Referring to the Mario Draghi's speech at the Global Investment Conference in London, on 26th July 2012*

[17] "*The single market for financial services is based on common rules which ensure that banks and other financial institutions which under the Treaty enjoy rights of free establishment and free provision of services are subject to equivalent rules and proper supervision across the EU" European Commission, COM/2012/0510 final.*

Banks Capital Requirements. The European Commission launched a proposal for new bank capital requirement to be implemented in order to reach higher capital and liquidity standards for banks. That proposal contains a directive (CRD IV) and a regulation (CRR), which would substitute the previous framework for bank capital requirements[18]. Following the Commission's proposals, CRD IV package has been implemented in 2013 through: the Directive 2013/36/EU and the Regulation (EU) No 575/2013.

The main aim of the directive is the discipline of the access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms. To this purpose, it contains provisions for:

> "The authorization of the business, the acquisition of qualifying holdings, the exercise of the freedom of establishment and of the freedom to provide services, the powers of supervisory authorities of home and host Member States in this regard and the provisions governing the initial capital and the supervisory review of credit institutions and investment firms." Directive 2013/36/EU

The European Council expressly clarified that this directive should be read together with the Regulation (EU) No 575/2013 which establishes prudential requirements for credit institutions and investment firms. As it is stated in the first article, these prudential requirements refer to: (i) elements of credit risk, market risk, operational risk and settlement risk; (ii) limits to large exposures; (iii) liquidity requirements to quantifiable, uniform elements of liquidity risk; (iv) reporting requirements of previous points and leverage; and (v) public disclosure requirements. The CRD IV package is the legislative framework through which the European Union has adopted the Basel III accords, which have been published in December 2010 by the Basel Committee on Banking Supervision[19]. Basel III accords are

---

[18] *Repealed legislation includes: CRD III package (Directive 2010/76/EU) on capital requirements for the trading book and for re-securitizations and the supervisory review of remuneration policies; CRD II package (Directive 2009/111/EC) in response to the financial crisis, which aimed at improving the management of large exposures, the quality of banks' capital, the liquidity risk management and the risk management for securitized products; and CRD I package (Directive 2006/48/EC and Directive 2006/49/EC) that aimed to improve transparency and to adopt Basel II guidelines.*

[19] *The Basel Committee is the primary global standard-setter for the prudential regulation of banks. Its permanent secretariat is located in Basel at the Bank for International Settlements where its members meet. It is composed of representatives of bank supervisory authorities and central banks from: Argentina, Australia, Belgium, Brazil, Canada, China, European Union, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Russia,*

based on the previous Basel II pillars (minimum capital requirements, supervisory review process and market strengthen market discipline) and aim to expands its provisions[20]. Particularly, through the new framework the BCBS intended to address the market failures revealed by the financial crisis and due to: (i) banks' excessive on and off-balance sheet leverage; (ii) gradual erosion of the level and quality of banks' capital; (iii) insufficient liquidity buffers; (iv) pro-cyclical deleveraging process and (v) interconnections of systemic institutions. The huge set of reforms has both a micro prudential and a macro prudential focus. The micro-prudential focus aims to strengthen bank level regulation so as to reinforce the resilience of individual banks while, the macro-prudential regulation intends to address systemic risk and their procyclical amplification. The BCBS also specified that both are highly interrelated due to the fact that the higher resilience of a single bank reduces also the risk of system-wide shocks (BCBS, 2010).

Basel III intends to increase the resilience of the global banking system thorough two set of rules: the first attains the "strengthening of the global capital framework"; the second contains provisions for the introduction of "global liquidity standard". Considering the first[21], BCBS clarifies that it is "crucial" that bank's risk exposures are backed by high quality capital base and for this purpose the provisions raise the quality and quantity of regulatory capital by giving a greater focus on common equity, the highest quality component of a bank's capital (CET 1). In detail BCBS has established:

Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States. (Bank for International Settlement's site)

[20] Basel II framework was introduced in 2004, after six years of works and researches, with the purpose to revise 1988 Accords (Basel I) by providing more risk-sensitive capital requirements in order to strengthen the soundness and stability of the international banking systems. Indeed, Basel II provided for the adoption of stronger risk management practices to better address issues arising from financial innovation that strongly increased during the years between two frameworks. It was based on three pillars: (i) minimum capital requirements for credit, market and operational risk; (ii) supervisory review of an institution's capital adequacy and internal assessment process; and (iii) effective use of disclosure as a lever to strengthen market discipline and encourage sound banking practices.

[21] For which regards the second set of rules on the "global liquidity standards", Basel III has provided for the development of two ratios: "a minimum liquidity ratio: (i) the Liquidity Coverage Ratio (LCR), intended to provide enough cash to cover funding needs over a 30-day period of stress; and a longer-term ratio, the Net Stable Funding Ratio (NSFR), intended to address maturity mismatches over the entire balance sheet" (BCBS, 2015).

i. The increase of Basel II minimum capital requirement that, after a transition period from 2013 to 2019, will reach the new standards of:
    a. Common Equity Tier 1 at least equal to 4,5% of risk-weighted assets;
    b. Tier 1 Capital at least equal to 6,0% of risk-weighted assets;
    c. Total Capital (Tier 1 Capital plus Tier 2 Capital) at least equal to 8,0% of risk- weighted assets.
ii. The introduction of a *capital conservation buffer*, with the aim to ensure that banks build up capital buffers outside periods of stress, which can be drawn down as losses are incurred. The Capital conservation buffer of 2,5% of risk-weighted assets must be composed of CET 1 elements.
iii. A *countercyclical capital buffer*, in order to consider the macro-financial environment where banks operate. As BCBS clarified, when national jurisdictions judge an excess aggregate credit growth as likely to be associated with a build-up of a system-wide risk, these authorities can deploy this buffer to to protect the banking system against future losses (BCBS, 2010).
iv. Additional capital requirements for systemically important banks.
v. A *leverage ratio*: a minimum amount of loss-absorbing capital relative to all of a bank's assets and off-balance sheet exposures regardless of risk weighting.

As previously stated, all these international reforms have been recognized in the EU law system through the adoption of the directive and the regulation that compose the CRD IV framework.

Deposit Guarantee Schemes. Although these schemes protect only a fraction of banks' deposits[22], their provision helps to ensure financial stability by decreasing the risk of depositors' panic withdrawals and bank run. With these schemes depositors are protected, up to a certain "coverage level", from the participation in banks' insolvency proceedings and this guarantee might increase confidence on the entire system. Even if the Directive 94/19/EC already provided for the creation of Deposit Guarantee Schemes, the financial crisis showed their inadequacy in maintaining the reliability of the banking system. As the European

[22]*Directive 2014/49/EU in Article 2(2) defines a deposit as: "A credit balance which results from funds left in an account or from temporary situations deriving from normal banking transactions and which a credit institution is required to repay under the legal and contractual conditions applicable, including a fixed-term deposit and a savings deposit, but excluding a credit balance where: (a) its existence can only be proven by a financial instrument […]; (b) its principal is not repayable at par; (c) its principal is only repayable at par under a particular guarantee or agreement provided by the credit institution or a third party".*

Commission (COM/2010/0368) reported, it was their fragmentation the cause of their inefficiency: There were about 40 DGSs in the EU and they covered different groups of depositors, with different coverage levels and different duties imposed to banks. Finally, the European Commission claimed that all these DGSs proved to be inadequate to overcome the crisis because of their scarce finance.

For these reasons, in October 2008, the Council of the European Union mandated the Commission to present a proposal to restore the DGSs, promoting their convergence. The results was the adoption of the Directive 2009/14/EC as an emergency measure that increased the coverage level from euro 20 thousand to euro 100 thousand (effective in December 2010). Moreover, this Directive contained provisions for further adjustments in Deposit Guarantee Schemes. To this purpose, in July 2010, the Commission presented to the European Council another proposal that, after the legislative procedure, has been approved by the European Council and adopted as the Directive 2014/49/EU. This last aimed to: (i) uniform depositors' level of protection; and (ii) ensure the same level of stability of Deposit Guarantee Schemes. In order to fulfill its objectives, the Directive contains provisions to reach: "a broadened and clarified scope of coverage, faster repayment periods, improved information and robust funding requirements" (Directive 2014/49/EU).

Bank Recovery and Resolution Process. The need of a more safe and reliable banking sector, that could be able to recognize and respond promptly to financial crisis, leads the Economic Union authorities to deal with bank's crisis management. In case of a bank's failure, it could not be sufficient to follow insolvency procedures because banks interdependencies could create the risk of a systemic crisis. For this reason, in 2012, the European Commission presented to the European Council a proposal for a Directive on Bank's recovery and resolution with the aim of creating tools through which authorities can promptly handle banking crisis, avoiding contagion risks. Following this proposal, in May 2014, the European Council adopted the Directive 2014/59/EU. Legislators intend to ensure creditors that in the event of a bank failure, they would bear losses only after shareholders and, in any case, those losses would be lower than the ones incurred under normal insolvency procedure. The directive also aims to uniform tools and mechanisms to resolve failing institutions, smoothing differences across Member States and encouraging cooperation between national authorities.

Moreover, through the enforcement of this directive the European Council wished to curb moral hazard problems by providing for any financial institution, and without considering size and interconnectedness, the possibility to exit the market. In this way, regulators intend to delete "too big to fail" awareness that drives managers' irresponsible

conducts. Nevertheless, Authorities recognize the public interest in placing a failing institution under resolution processes, which are able to avoid adverse effects, protecting covered depositors, investors, clients assets, etc.

The directive 2014/59/EU distinguishes two different plans to be provided by financial institutions and controlled by competent/resolution authorities:

i. A *recovery plan,* containing all the measures to be taken by institutions with a deteriorated financial situation in order to restore it (Article 5).
ii. A *resolution plan,* which provides the action that the resolution authority may take for institution that are failing or likely to fail (Article 10). By the use of resolution tools, authorities intend to: (i) ensure the continuity of critical functions; (ii) avoid a significant adverse effect on the financial system; (iii) protect public funds, taxpayers, covered depositors and investors as well as client funds and client assets (Article 31).

Considering that one of the objectives of this directive is to preserve taxpayers, both these plans should not assume access to extraordinary public financial support. Moreover, resolution plans shall assume neither central bank emergency liquidity assistance nor central bank liquidity assistance under non-standard collateralization (Article 10(3)).

The Article 37 establishes that Member States ensure that resolution authorities have the power to apply the following resolution tools:

i. The sale of business tool; which entitles authorities to transfer to a purchaser that is not a bridge institution: (a) shares or other instruments of ownership; (b) all or any assets, rights or liabilities (Article 38).
ii. The bridge institution tool; which differs from the first because the purchaser must be a bridge institution defined as an institution that: (a) it is wholly or partially owned by one or more public authorities and it is controlled by the resolution authority; (b) it is created expressly for the purpose to receive and maintain instruments of ownership and/or assets, rights or liabilities (Article 40).
iii. The asset separation tool; through which assets, rights or liabilities of an institution under resolution or a bridge institution can be transferred to one or more asset management vehicles that have the duty to manage those assets trying to maximize their value (Article 42).
iv. The bail-in tool that is defined as "the mechanism for effecting the exercise by a resolution authority of the write-down and conversion powers in relation to liabilities of an institution under resolution" (Article 1 and 43).

Minimum capital requirements set out in the CRD IV package, the Directive 2014/49/EU that establishes Deposit Guarantee Schemes and the Bank Recovery and Resolution Process draft in the Directive 2014/59/EU constitute the *single rulebook* that all financial institution in EU must comply with. It is the foundation of the banking union that is constituted of three pillars:

i. The Single Supervisory Mechanism;
ii. The Single Resolution Mechanism;
iii. The European Deposit Insurance Schemes.

The first two have been indicated in the European Commission's communication of September 2012, as the two fundamental steps to reach the banking union, together with the harmonization of Deposit Guarantee schemes.

Regarding the *Single Supervisory Mechanism*, after the European Commission proposals, have been approved:

i. The Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions;
ii. The Regulation (EU) No 1022/2013 of the European Parliament and of the Council of 22 October 2013 amending Regulation (EU) No 1093/2010 establishing a European Supervisory Authority (European Banking Authority) as regards the conferral of specific tasks on the European Central Bank pursuant to Council Regulation (EU) No 1024/2013.

Through these two regulations Authorities intend to modify the previous set of rules (Regulation (EU) No 1093/2010) so that supervisory powers on financial institutions are conferred on a Single Supervisory Mechanism composed of the European Central Bank and the Euro-Area member states' National Competent Authorities (Council Regulation (EU) No 1024/2013, Article 6). In this way, it is ensured a strong and consistent supervision maintaining, at the same time, the local know-how of NCA. Moreover, it has been provided for the adoption of the Single Supervisory Mechanism also in Member States that have not adopted the single currency. In this case, the National Competent Authorities participate to the Single Supervisory Mechanism and cooperate with the ECB.

While the first article of the Council Regulation (EU) No 1024/2013 confers to the ECB specific tasks relating to prudential supervision, the article 3 provides for the strict cooperation between ECB and: (i) all components of the European System of Financial Supervision; (ii) authorities empowered to resolve credit institutions. Particular attention is

given to the cooperation between ECB and National Competent Authorities: article 6 envisages "a duty of cooperation in good faith, and an obligation to exchange information".

Article 4 lists all the tasks that have been assigned to the ECB that, after the entry into force of the regulation, is entitled, among others, to: (i) give and withdraw authorizations of credit institutions; (ii) assess notifications of the acquisition of qualifying holdings in credit institutions; (iii) ensure compliance with capital requirements, large exposure limits, liquidity and leverage as well as for what concern risk management processes, internal control, Internal Risk Based models; (iv) carry out supervisory reviews, together with the EBA, such ass stress tests, specific additional capital requirements, publication requirements and so on. Nonetheless, except for the first two tasks, the article 6 provides that for financial institutions that are not considered "significant" all the other tasks shall be carried out by National Competent Authorities in accordance with regulations, guidelines and instruction provided by the European Central Bank. The article also establishes requisites that a financial institution should have to be considered "significant". The "significance" attribute is conferred to financial institutions considering: (i) size; (ii) importance for the economy of their Member State or of the Union as a whole; and (iii) significance of cross-border activities. In any case, the article establishes that the ECB can consider an institution as "significant" on its own initiative and that in any case a financial institution cannot be considered "less significant" if:

> "(i) The total value of its assets exceeds EUR 30 billion;
> (ii) The ratio of its total assets over the GDP of the participating Member State of establishment exceeds 20 %, unless the total value of its assets is below EUR 5 billion;
> (iii) Following a notification by its national competent authority that it considers such an institution of significant relevance with regard to the domestic economy, the ECB takes a decision confirming such significance following a comprehensive assessment by the ECB, including a balance-sheet assessment, of that credit institution" Council Regulation (EU) No 1024/2013, Article 6(4).

With regard to the Regulation (EU) No 1022/2013, it expressly states that, even after the introduction of the Single Supervisory Mechanism, the European Banking Authority shall maintain its powers and tasks with regard to: (i) the development and the application of the single rulebook; and (ii) the enhancement of convergence across the Union for which regards supervisory practices.

In order to deal with the misalignment between the Union supervision provided by the Single Supervisory Mechanism and the national treatment of resolution proceedings by national competent resolution authorities established in the Directive 2014/59/EU, a *Single Resolution Mechanism* has been proposed, which flowed into the Regulation (EU) No

806/2014. The regulation (article 1) establishes a Single Resolution Board that, together with the Council, the Commission and the national resolution authorities shall apply the uniform set of rules set out by the Single Resolution Mechanism framework. The regulation provides also for the constitution of a Single Resolution Fund.

The article 42 defines the Single Resolution Board as a Union Agency with seats in Brussels characterized by full legal personality based on which it can "acquire or dispose of movable and immovable property and be a party to legal proceedings". It is composed of a chairperson; four full-time members; and, a member for each state, representing their national resolution authorities (article 43). Provisions about the Single Resolution Fund are contained in the Chapter 2 of the Regulation. Article 67 establishes that it shall be composed of funds raised at national level and that it shall be used by the Board in order to ensure the efficient application of resolution tools and resolution powers.

The last pillar to complete the banking union has been proposed by the European Commission in November 2015 (European Commission, *COM/2015/0286)*. The proposal intends to amend the regulation EU 806/2014, without altering the rules of the Single Resolution Mechanism but establishing the *European Deposit Insurance Scheme.* Although the DGSs Directive already provided to the harmonization of their main features and functioning, some important aspects are still at the discretion of Member States. The European Commission states that in order to reduce both, vulnerability of bank depositors and links between banks and their sovereign, the European Deposit Insurance Scheme is needed. Moreover, the European Commission highlighted that since the Bank Recovery and Resolution Directive and the Single Resolution Mechanism Regulation have already provided for the possible use of Deposit Guarantee schemes, the establishment of a common system is the "logical next step" to complete the Banking Union. In a communication relative to its proposal, the Commission also specifies that through the amendments of the Regulation (EU) 806/2014 it will be constituted a European Deposit Insurance Fund that will be maintained separate from the Single Resolution Fund and that will be composed of banks' contributions. Moreover, amendments will provide that a strong independent authority at banking-union level would administer the European Deposit Insurance Schemes. The European Commission proposed the Single Resolution Board to play this role, after having adopted some changes in its governance structure to avoid potential conflict of interest between the resolution and the deposit guarantee functions.

In this way, the Commission intended to give to European Deposit Insurance Schemes the same construction of ESM and ERM: a single rulebook composed of the Deposit

Guarantee Directive for all Member States and the EDIS that will be mandatory for all Euro-Area member states but as well as the other two, open to non-Euro area member states.

Finally, to underline the link between the three pillars, the Commission envisages that non-Euro Member States willing to participate to the Banking Union would be required to participate in all the three pillars.

1.2. IAS/IFRS and banks' financial statements

The framework described in the previous paragraph is part of regulators' attempt to harmonize internal market in Europe and its capital markets in particular. Homogeneity in regulation and supervision could not be achieved without the provision of a unique set of standards governing the production of financial statements.

To this purpose, yet in 2002, the European Parliament and the Council have adopted the Regulation (EC) No. 1606/2002 on the application of International Accounting Standards. These standards have been developed by the International Accounting Standard Committee with the aim to provide a single set of accounting standard. The International Accounting Standard Board replaced the IASC in 2001 and the new set of standards has been renamed International Financial Reporting Standard – IFRS. Nonetheless, the last goal of this harmonization process has not been altered: through the adoption of IAS/IFRS could be ensured a high degree of transparency as well as the comparability of financial statements. These two characteristics increase the investors' confidence about the functioning of financial markets ensuring also the principle of freedom of movement of capital across European internal market. Additionally, their introduction is considered crucial for cross-border transactions and for listing anywhere in the world[23].

The international accounting standards adoption[24] has changed significantly the structure and the composition of banks' financial statements. The drivers of these changes are principles contained in IAS 1 "Presentation of Financial Statements" and IAS 7 "Cash Flow Statements" that, among with other adjustments, introduce the Cash Flow Statements and the Statements of changes' in Shareholders' equity.

Nonetheless, three standards assume a crucial position: (i) IAS 32, "Financial Instrument: Presentation"; (ii) IAS 39, "Financial Instrument: Recognition and Measurement"; and (iii) IFRS 7, "Financial Instruments: disclosure". Indeed all these regard

---

[23] *Regulation (EC) No 1606/2002*

[24] *Information reported in this paragraph and in all its sub-paragraphs come from: Paolucci, G. and Menicucci, E., 2008.*

banks and financial intermediaries' operations concerning financial assets and liabilities. Their impact is evident in the principles regarding classification and valuation of financial instruments. These provisions give greater importance to the Notes of financial statements where a lot of qualitative and quantitative information are included in order to: (i) highlight the impact of financial management; (ii) forecast the amount, the deadline and the probability of cash flows inherent the issue of financial instruments. In this way it is possible to obtain a more transparent and qualitative information arising from financial statements.

1.2.1. Financial Instrument evaluation methods

The most important change introduced by international accounting standards attains the valuation method used to determine the value of financial instruments. It is evident that, since the greatest portion of assets (and liabilities) in banks' financial statements are composed of financial instrument, their evaluating process assumes a predominant role.

Although a lot of European countries used to believe that the "historical cost"[25] method is the primary criteria through which evaluates financial statement items, with the adoption of these standards this method has been substituted by the "*fair value*" one, that becomes the *benchmark* method. IAS 32 defines the *fair value* as:

> "The amount for which an asset could be exchanged or a liability settled between knowledgeable, willing parties in an arm's length transaction" IAS 32, par. 11

As it has been explained by Paolucci and Menicucci (2008) these two methods arise from different prerequisites: the first one is based on results of an effective, real transaction while the latter refers to a potential exchange, requiring to calculate the theoretical value of an hypothetical transaction. Authors explain that the transition from the first to the second is a signal of the willingness to go beyond the concept of "effective" transaction in favor of the "potential" one. This also means that, through this method, costs and revenues are accounted even in absence of a specific and effective transaction. Although this could be seen as a loosening of the prudence principle, actually IAS/IFRS provide for the imputation of positive variation in the value of assets in a specific reserve until they are effectively realized. Nonetheless, IAS 39 establishes that if those expected profits are high probably and reliably determinable, they can be accounted directly through profit and loss statement. On the contrary, valuing an item with the *fair value* method also implies that whenever the actual

[25] *Through this method, assets are accounted in balance sheet considering their nominal or original cost when acquired by the company.*

value of an asset (liability) is lower (higher) than the accounted one, losses are recorded immediately[26].

Although the use of financials constantly revised allows highlighting resources employed for the business activity and future cash flows that can be produced, this also implies a higher variability of profits/losses. This is source of particular concerns especially in the banking sector since that more updated financial information are also more uncertain and variable: indeed, they come from economic elements that do not arise from exchanges but are consequences of theoretical valuations expressed by the market or by indirect estimation methods. Paolucci and Menicucci (2008) point out the presence of information that are relevant but for which reliability could be questionable. For this reason, IAS/IFRS sketch the presence of a trade-off between more value relevant information and the safeguards of a greater level of reliability.

It should also be considered that the coincidence between market prices and *fair values* is verified only when an active market exists for the financial instrument. In that case, quoted prices that are readily and regularly available from an exchange, dealer, broker, industry group, pricing service or regulatory agency constitute the fair value for the instruments, since it reflects the price at which the exchange would be concluded at market condition between willing parties. *Effective market quotes* represents the "first level" of fair value.

In the case in which these effective market quotes are not available or the market is not functioning regularly, IAS 39 impose a hierarchy of the methods to be used in order to determine the fair value of financial instruments using valuation techniques.

The second level of fair value, the *comparable approach*, is based on market-observable parameters: it provides for the identification of elements inside the market that could be useful to evaluate the financial instrument. The calculation methodology is based on the reproduction of prices of financial instruments quoted on active markets. Moreover, this approach uses an appropriate credit spread test, estimated from financial instruments with similar characteristics. Sources for the evaluation of financial instrument through this method are: (i) quoted and liquid securities of same issuer or of an issuer with same rating and belonging to the same sector; (ii) Credit Default Swap on the same reference entity.

The third level of fair value is the *Market-to-model:* it is based on non-observable and more discretional inputs. Fair value is estimated by way of assumptions made by the valuator

---

[26] *On the contrary through the historical cost method it is necessary to ascertain that those are durable losses. These losses are accounted through a depreciation that is an index of the irrevocable loss in value.*

when no comparable financial instruments are available and on the definition of some kind of parameters to use. The calculation methodology is based on: (i) development of future cash flows; and the (ii) level of specific input parameters not quoted on active markets.

From the definition of the three levels of fair value, it is clear that fair value could be usefully determined only for financial instruments whose valuation is verifiable, that is, when a regulated active market exists or when it is possible to determine fair value through valuation techniques. In all other cases it is necessary to use the historical cost method. This means that IAS 39 identifies *fair value* as the benchmark method for the evaluation of financial instruments[27]. Considering that these instruments are particularly relevant for banks, since that they constitute the largest part of assets and liabilities, the main observation concerning fair value are the ones linked to the impacts of this method on recognition, valuation and information concerning financial instruments.

Financial instruments

Two principles assume great importance for the study of the impact of fair value on financial instruments: IAS 32 and IAS 39. The first describes rules inherent the presentation of financial instruments as well as their definitions, while the second establishes how they are initially measured, evaluated and derecognized. It also provide rules concerning how assets (liabilities) are classified, respecting the principle of *substance over form*[28], in four (two) categories depending on objective and subjective elements. Objective elements attain some technical characteristics of financial instruments while subjective elements are linked with management motivation to detain such instruments.

The assets categories set out by IAS 39 are: (i) Financial assets at fair value through profit or loss; (ii) Held to Maturity; (iii) Loans and Receivables; and (iv) Available for sale. While the liabilities categories are: (i) Financial Liabilities at fair value through profit or loss; and (ii) Other liabilities.

Initial measurement. Financial assets and liabilities are initially measured at their fair value (that is the payment due for financial asset or received after the issue of a liability). Normally it comprises also transaction costs directly imputable to the transaction anyway, the initial measurement value of financial assets/liabilities *at fair value through profit or loss*

---

[27] *IAS 32, "Financial instrument: presentation", defines a financial instrument as a contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity.*

[28] *The substance over form principle is an accounting concept which means that the economic substance of transactions and events must be recorded in the financial statements rather than just their legal form in order to present a true and fair view of the affairs of the entity.*

does not include these costs since that in this case they have to be considered in the statement of profit or loss. For which regards the date of the initial measurement, IAS 39 specifies that the recognition of a financial asset or a financial liability must be done only when the entity becomes a party to the contractual provisions of the instrument that is in the *trade date*[29].

Derecognition. Financial assets are derecognized if: (i) their sale leads to the substantial transfer of all the risk and rewards connected; (ii) the asset is sold and the entity retains the contractual rights to receive cash flows but signs a simultaneous obligation to pay such cash flows to third parties; or (iii) if it is no possible to ascertain the transfer but no control over the asset is maintained. On the contrary, in the case that: (i) a significant part of the risk and rewards is maintained, the financial assets sold continue to be recorded in assets; or (ii) control is maintained even partially, the assets continue to be recognized for the entity's continuing involvement, measured by the bank's exposure to changes in value of assets sold and to variations in relevant cash flows.

The principle disciplines how financial assets and liabilities can be classified in each category, specifying for each one subsequent measurement methods and how to account fair value changes.

Financial assets at fair value through profit or loss. It should be noted that IAS 39 provide for both assets and liabilities at fair value through profit or loss to be furthermore decomposed in: (a) Held for Trading; and (b) financial assets (liabilities) *designated* at fair value through profit or loss.

In the first subcategory are included financial instruments that the management intends to sell in the short run, so as to profit from the spread between the price at which they have been bought and the one at which they could be sold. The subjective characteristic of assets in this category attains the fact that management considers these activities as short-term/current investments so as to maintain a reserve of financial resources that are promptly realizable. With regards to the objective characteristic, this category includes the instruments that generally compose the bank's trading book: debt securities and equities; positive value of derivative contracts[30] but excluding those designated at hedging purposes.

---

[29] *It should be considered that in the case of loans the trade date and the disbursement date could coincide. Paolucci and Menicucci (2008, p.128).*

[30] *Including also those embedded in combined financial instruments subject to separate accounting when: (i) characteristics and risk are not closely related; (ii) embedded instrument fully meets the definition of derivatives; (iii) combined instruments are not measured at fair value with changes recognised in profit and loss.*

The latter sub-category represents a sub-portfolio whose ratio is the "*fair value option"* for which any financial asset that is designated on initial recognition as one to be measured at fair value with fair value changes in profit or loss. The possibility arises from specific circumstances indicated in the principle or in order to give more relevant information by the use of fair value.

Assets included in both these sub-categories are measured at *fair value* through Profit and Loss[31]. If they are quoted on active market the fair value is constituted by market quotations; otherwise standard practices estimation methods and valuation techniques are used. For which regards equity, quota of CIU and derivative instruments which have equity as underlying assets that are not quoted on an active market and for which is not possible to determine a fair value, IAS 39 provides that they are maintained at cost.

Held to Maturity instruments. Contrary to Held for Trading financial instruments, the ones that turn up in this category are non-derivative financial assets with fixed or determinable payments that an entity intends and is able to hold to maturity and that do not meet the definition of loans and receivables and are not designated on initial recognition as assets at fair value through profit or loss or as available for sale. This definition sets out the two subjective prerequisite: first, the management's intent to detain instruments until the date of maturity; second the economics and financial ability to detain them. To this purpose it should be considered that the designation of a financial instrument into "held to maturity" category is not free from criticism. Particularly the bank should consider that this choice could impede to undertake other more profitable opportunities and subject the bank to rate changes and other risks linked with variable market conditions.

Financial assets held to maturities are valued at amortized cost using effective interest method[32]. When these assets are derecognized or impaired: profit or losses are recorded in the Income statements. Through the amortization process their book value is compared with their present value reimbursable at maturity. IAS 39 provides that these assets are assessed to identify if they show objective evidence of impairment losses. If evidence exists the loss is equal to the differences between their carrying value and the present value of estimated future

---

[31] *The fact that fair value differences are accounted through the Income statements means that any positive or negative changes in value of financial assets contribute in determining Net Profit (Loss) of the year.*

[32] *The effective interest rate is defined as the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial instrument to the net carrying amount of the financial asset or liability.*

cash flows discounted at the original effective interest rate. The loss is recorded in the Income Statements. If the reasons cease to exist: recoveries are recorded in Income Statements and must not lead the carrying amount to exceed the amortized costs, had no impairment losses been recognized in previous periods.

Available for Sale instruments are any non-derivative financial assets designated on initial recognition as available for sale or any other instruments that are not classified as (a) loans and receivables, (b) held-to-maturity investments or (c) financial assets at fair value through profit or loss. These assets represent a temporary investment but they are not intended to be sold in the short term nor to be maintained until maturity: they constitute a momentary investment and the category is a residual group where are included all financial assets that do not meet criteria of other categories. They are measured at Fair Value and gains and losses deriving from changes in fair value are recorded in a specific reserve of shareholders' equity[33].

Equity, quota of CIU and derivative instruments, which have equity as underlying assets and are not quoted on an active market and for which is not possible to determine a fair value are maintained at cost.

As held to maturity instruments, even these ones are assessed to identify if they show objective evidence of an impairment loss**.** If such evidence exists the loss is equal to the carrying value of asset minus its fair value. If the reason cease to exists the value of the asset must be recovered through the Income Statements for loans and debt securities and the shareholders' equity for equity. Size of the recovery must not lead the carrying amount to exceed the amortized costs. The loss must be identified in a reliable way and must be incurred and not merely expected.

Loans and Receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market, other than held for trading or designated on initial recognition as assets at fair value through profit or loss or as available-for-sale. Loans and receivables, for which the holder may not recover substantially all of its initial investment, other than because of credit deterioration, should be classified as available-for-sale. Subsequent measurements are made at amortized cost[34] defined as their initial value,

---

[33] Through the use of this shareholder's equity reserve it is possible to highlight the presence of changes in value of financial instruments without impacting the Income statements with profits or losses not yet realized. On the contrary, they will impact Income statements only in the moment of the sale or of derecognition of the financial instrument.

[34] The amortized cost method can be used only for short-term loans, not for: (i) loans whose short maturity implies the application of discounting approach that leads to immaterial effects; (ii) loans with unspecified maturity; (iii) loans with notice period. All these loans are recorded at historic cost.

plus/minus principal repayments (calculated using effective interest method) plus/minus adjustments/recoveries, minus amortization.

Together with Held to Maturity and Available for Sale financial instruments, loans are assessed to identify if they show objective evidence of impairments. IAS 39 establishes that, every credit should be valued individually if it is *significant*[35] while it should be valued individually or collectively if the single credit is not considered significant. Through this first evaluation it is assessed if the credit constitutes a performing or a non-performing loan. The latter are credits for which exist objective evidences of losses; they represent risky credits that can be bring back to the concept of default[36].

Performing loans are subject to collective measurement with homogeneous categories in terms of credit risk and the percentage of loss is estimated considering past time series and other observable elements to determine the latent loss for each category.

In the second case, *Non Performing Loans* are subject to individual measurement and determination of credit adjustment. Particularly, NPL are subject to individual measurement process or, for small position, the calculation of the expected loss for homogeneous categories and the consequent allocation to each position the amount of the adjustment of each loan. This adjustment is equal to the carrying value at time of measurement (amortized cost) minus the

---

[35] *In order to define a credit as "significant" some qualitative and quantitative parameters have to be considered: amount of the credit with reference to some banks' aggregates (resources, capitalization…); other positions of the single borrower, credits belonging to some categories, credits that are relevant for the banks for its strategic plans.*

[36] *Particularly: Doubtful loans, where the borrower is judged as "insolvent" by a bank or a court; Substandard loans where financial difficulties are believed that can be removed in a short period; Restructured loans and Past-due loans that already reached the maturity but have not been paid. These categories of credits meet the list of events set out by IAS 39 (59) that defines situations in which there is objective evidence of value reduction: "significant financial difficulty of the issuer or obligor; a breach of contract, such as a default or delinquency in interest or principal payments; the lender, for economic or legal reasons relating to the borrower's financial difficulty, granting to the borrower a concession that the lender would not otherwise consider; it becoming probable that the borrower will enter bankruptcy or other financial reorganization; the disappearance of an active market for that financial asset because of financial difficulties; or observable data indicating that there is a measurable decrease in the estimated future cash flows from a group of financial assets since the initial recognition of those assets, although the decrease cannot yet be identified with the individual financial assets in the group […]".*

present value of expected future cash flows discounted at the original effective interest rate (which is unchanged over time).

Both these individual and collective adjustments are recorded in Income Statements. If the reasons which lead to the impairment cease to exist the original value of the loan must be reinstated in subsequent periods, provided that it happened due to an event subsequent to the impairment. The recovery is recorded in the IS and includes the time value effects.

Considering the two categories of liabilities, the first, *financial liabilities at fair value through profit or loss*, follows the same decomposition and the same rules described for *financial assets at fair value through profit or loss.* The second one, *other liabilities*, includes liabilities arising from the business activity and contracted loans.

Finally, IAS 39 imposes strict regulations for which regards reclassifications, especially with reference to Held to Maturity instruments. The ratio of these regulations is to limit discretional and opportunistic changes aimed to obtain more favorable valuation methods that leads to the cover up of capital losses and/or to defer capital revenues. As an example, the principle establishes that financial instruments in the category "at fair value through profit or loss" cannot be reclassified in any other category as well as financial instruments in any other category cannot be reclassified in that specific one that provides for a fair value evaluation with direct allocation in profit and loss statement.

In the light of what have been presented, advantages and disadvantages of the use of *fair value* appear clearly: the evaluation of a financial instrument through fair value implies that volatility of such estimate will rise sharply; on the contrary, information arising from such estimation techniques are projected toward the extern of the firm, with the aim of highlighting the business situation to investors so that the financial statement becomes the link between the company and the market.

Nonetheless International Accounting Standards impact not only accounting methods through which develop financial statements but also banks' organization and management. Financial statements drawn up and the recognition and measurement of financial instrument postulate a financial accounting approach that has to consider the interaction of different organizational functions and the conciliation of accounting and financial competences. Indeed IAS 39 provides for the use of analytic and financial valuation techniques that are generally adopted only for management purposes.

In order to follows dispositions set out by IAS 39, banks have to develop innovated processes concerning risks measurement, management and control that are all prerequisites for the evaluation of financial instruments. As an example, the method of discounted cash flow is associated with high degree of subjectivity in both, the estimation of cash flows and

the choice of the discounting rate, which should reflect the degree of risk. Difficulties linked with the adoption of such method for the estimation of reliable *fair value* cannot be overlooked, as well as the fact that this method requires that accountant utilize values arising from algorithms and techniques developed in Risk management and Finance areas. It is for this reason that IAS 39 does not impact only accounting procedures; its effects are relevant for the whole organization with a particular focus on the cooperation among different business areas (Risk Management, Treasury, Finance, Administration)[37].

Risk Management assumes a predominant role also for the evaluation of banks' receivables, as the amortized cost method cannot exclude considerations regarding the riskiness of each position as well as the procedures for their segmentation. Moreover, evaluation techniques developed by IAS 39 have also consequences on banks' commercial strategies that have to consider the assessment of the impairment. These consequences includes also new types of customers clustering through strategic positioning actions and the redefinition of pricing strategies capable to consider the degree of risk assumed by the bank[38]

[37] *Paolucci and Menicucci, 2008, p. 111.*

[38] *Paolucci and Menicucci, 2008, p. 147.*

Chapter II

Value Relevance Literature

The last goal of this study is to assess whether banks' market-to-book ratios and stocks returns follow the trend of some Financial Statements information. The argument is largely discussed in the academic literature where an accounting measure that has a significant relation with share price is defined as *value relevant*.

The chapter proceeds as follows: the first paragraph focuses on authors that clarify, criticize and discuss about the "relevance" of value relevance literature. The second paragraph is the review of studies that concentrate on the banking sector. The peculiarity of these researches is that they focus on one single issue over time, trying to provide evidence of the value relevance of: fair value estimate, capital structure, diversification, rating changes and IFRS adoption. On the contrary, the last paragraph contains articles in which banks' Market-to-Book ratio and banks' stocks returns are regressed with different financial statement items.

2.1. Relevance of Value Relevance studies

Even before the adoption of the terms "value relevance" many studies, in finance, try to understand the impact of some financial statements information on firms' market value. The literature is so wide that some authors[39] extend it until Modigliani and Miller researches. In this paragraph there is a review of the studies that present, define and criticize the concept of value relevance.

Francis and Shipper (1999) try to answer the question whether financial statements are loosing their value relevance, taking into account the period 1952-94. Decrease in financial statements value relevance should infer that balance sheets information are not able to explain equity market values anymore. They find that while returns of trading strategies based on the trend of earnings decreased over time, this is not the case for trading strategies based on book values of assets and liabilities.

[39] *See page 41 about Barth, Beaver and Lendsman (2001) study.*

The issue has been brought to light also by the works of other authors mentioned by Francis and Shipper (1999)[40]: In 1996, Amir and Lev in their article about the value-relevance of nonfinancial information in the wireless communications industry, suggested that, to improve balance sheet informative content, the disclosure of some value relevant variables should be reported and that there should be a change in the income measurement and in the asset valuation. In 1997 Collins, Maydew and Weiss achieved similar findings of Francis and Shipper (1999) concluding that are due to the increased importance of unreported intangible assets and reported losses. In 1999, Lev and Zarowin highlighted the needs for financial statements to reflect the change in business environment.

In their work, Francis and Shipper (1999) give four interpretation of value relevance: (i) The first considers that financial statements information capture the intrinsic share values, that is the value where stock prices tend to converge. In this context, value relevance attains the profits coming from "accounting-based" trading. (ii) In the second interpretation, all the financial information that are used in valuation models are defined "value relevant". (iii) In the third, the attribution of value relevance is subject to the presence of a statistical association between balance sheet information and prices/returns taking into account whether the information is used by investors or not. Value relevance attains "the ability of the financial information of changing the total mix of information in the market place" (Francis and Shipper, 1999, p. 325). In the last interpretation, (iv) the statistical association refers to the correlation between accounting information and information used by investors. A value relevant information is the one that is capable to concentrate information that affects market values.

One of the criticisms that have been addressed to value relevance studies is the one of Holthausen and Watts (2001). The authors argue that value relevance studies have restricted influence for standard settings and, in absence of a specific theory that describes the empirical associations, these kinds of researches cannot be useful and remain only mere associations. The object of the analysis of Holthausen and Watts is then to critically evaluate the standard-setting inferences that various authors have intended to provide. An interesting point of the paper is the classification of the value relevance studies in three different categories: (i) *"Relative association studies",* in which the market value is associated with alternative bottom-lines accounting measures. In these studies, the variable of the regression with the greatest R^2 is described as the more value relevant. (ii) "*Incremental association studies"* test

[40] *For further information about Amir and Lev (1996); Collins, Maydew and Wess (1997) and Lev and Zarowin (1999) see Francis and Shipper 1999, p. 323.*

if additional accounting variables could be value relevant in explaining market value. (iii) *"Marginal information content studies"* analyse the supplementary information provided to investors by the use of an accounting measure. Holthausen and Watts (2001) consider fifty-four studies in which authors explicitly indicate that results have implications for standard settings. The majority of these studies are relative or incremental association (the 94 percent of the sample; against the 11 percent of "information content studies").

The accounting theories used in value-relevance studies have been connected to *"direct valuation"* theory and *"inputs-to-equity valuation"* theory (Holthausen and Watts 2001, p.11). The first consider earnings or book values of equity as measures associated with equity market values. The latter is aimed to provide information on plausible inputs of a valuation models. Authors define three different valuation models: (i) *balance sheet model*, in which market value of equity equals market value of assets less market value of liabilities; (iii) *earnings model*, that link earnings to future cash flows; (iii) *Olshon model*, developed by Olshon (1995), that defines the market value as a linear function of the book value of equity and the current value of any extra-profit, "abnormal earning".

Holthausen and Watts (2001) argue that the impediment in these theories is their lack to explain accounting and standard setting. The authors show how neither the direct valuation of equity nor the inputs to equity valuation are really able to provide such explanation, concluding that valuation literature cannot be used to derive standard setting implications.

Barth, Beaver and Landsman (2001) reply to Holthausen and Watts showing the pertinence of the value relevance studies for accounting standard setting. In their reply, also Barth, Beaver and Landsman define the value relevance as an association – correlation – between accounting measures and market value. The writers specify that even Modigliani and Miller in 1961 have conducted this kind of analysis even without an explicit reference to the two terms.[41]

The fact that value-relevance attains the ability of an accounting amount to reflect relevant information for investors, does not mean that it will be also decision relevant: In order to be decision relevant, a value relevant amount must be the last available information. If a more timely one replaces it, then the accounting information could be considered as value relevant but not as decision relevant (Barth, Beaver and Landsman, 2001). The question has been already discussed by Francis and Shipper (1999, p.324):

> "Other concerns expressed about, and recommendations for changing, financial reporting seem to address the issue of when information is reported, specifically the timeliness of financial

[41] *For further information about Modigliani and Miller see Barth, Beaver and Landsman, 2001, p.79.*

reporting and the extent to which competing information pre-empts financial statement information."

Barth, Beaver and Landsman (2001) suggest that this point can be solved: (i) by changing what is reported without variation in the frequency of reports; (ii) by increasing the frequency of reporting; (iii) by requiring restated financial statement or forecasted financial statements in order to maintain unchanged the frequency and the object of what is reported.

Another interesting aspect point out is a specific distinction of the two approaches through which studies proceed. Researches can be developed in terms of level of firm value or in terms of changes in share prices (returns). The first, that are also the most used, explains cross-sectional variations in share prices. Miller and Modigliani, 1966 and Ohlson, 1995[42] are some of the authors that have been mentioned by Barth, Beaver and Landsman (2001) and that develop this kind of analysis. The two valuation models approach different but related questions: the first intend to determine what is reflected in the share price while the latter what is reflected in stock returns over a specific period of times. Different inferences and conclusions arise from the two approaches and it is therefore crucial to promptly recognize which question the author intends to answer in order to avoid incorrect inferences.

Among other conclusions of their work, Barth, Beaver and Landsman explain that contrary to Holthausen and Watts (2001)'s declarations, value relevance studies are designed to explain stock market value rather than firms' value. They end the work arguing that, given the complexity of financial markets, that increase over time, "it is a challenge for accounting research to make a substantive contribution in addressing questions relevant to standard setting" (Barth, Beaver and Landsman 2001, p.99).

Globalization of financial markets and the increase in international investments are the two drivers described also by Anandarajan et al. (2011) to explain the expansion of value-relevance literature. Studies examine the association between market value (or returns) and income, firm assets and liabilities. Conclusions of these studies arise from: explanatory power of the models; significance of the regression coefficients; test of market adjusted stock returns. Authors observe that one of the restrictions of these studies comes from their samples that, often, gather entities of different industries, which have different characteristics. Given these dissimilarities, in their point of view, it is difficult to provide correct results and inferences on value relevance studies. For the same reason, in the proceeds of their work, they concentrate on one single industry: banking.

[42] *For further information, see Barth, Beaver and Landsman, 2001, p. 95.*

2.2. Value Relevance in Banking

Banks prominent role on international economics development and the increasing consolidation of the sector make banking value relevance studies particularly interesting. Nevertheless, banks financial statements are less transparent than those of industrial firms and international regulations as Basle Accords, harmonize them only partially: Cross-country differences in the definition of some financial statement elements still remain and, for this reason, studies on banking sector are mainly domestic ones[43]. Most of the studies, if not differently specified, refer to United States banking system. Nevertheless, for the international context, Anadarajan et al. (2011) provide evidence of the effect on value relevance of some measures that account for: mandatory disclosure; corporate, legal, economic and financial environment; differences in accounting measurement practice; bank regulatory environment; Banks' size; relative risk, non traditional activity and multinational status. A first step of the analysis is constituted by the regressions of book value, earnings and the combination of both on market value. Then, authors use the coefficients obtained in the first step as proxy variables for value relevance in the regression investigating the importance of the over mentioned country-level and bank-level measures. As results, they obtain evidence of the explanatory power of earnings in market-based economies with a common low background and in British/American clusters; the contrary holds for book value. Anandarajan et al (2001) also find that value relevance is affected by transparency coming form disclosure requirements: the higher they are, the more significant is value relevance. Private sector oriented environment and a shareholders friendly legal environment also increase value relevance and, for all these reasons, authors conclude that British American banks are more value relevant.

The rest of the paragraph is composed of four sections through which studies are classified: First, an overview of the value-relevance of fair value estimate. Second section concern studies about the role of the banks' capital structure. Third section attains literature regarding banks' business model and product diversification. Lastly, there are the studies on the effects of rating changes and IFRS adoption.

2.2.1. Value-Relevance of Fair Value

Banks' financial statements differ from industrial firms' ones because they are mostly composed of financial instruments such as loans, securities and OTC derivatives. This peculiarity force banks to continuously recognize and measure risks associated whit those

[43] *Anandarajan et al. 2011, p.34.*

exposures. Moreover, International accounting standards[44] provide for the adoption of *fair value* method, rather than the historical cost. The easiest way to obtain the fair market value of a financial instrument is to observe the price with which it could be exchanged in a secondary market. Anyway, if such markets are not available for financial instruments, the estimation of their fair value can rely only on internal "asset-pricing model" (Resti and Sironi, 2007, p.278).

Financial instrument's fair value literature investigates the value relevance of such estimations.

Investments Securities

Barth (1994) studies the correlation between fair values of banks' investment securities and fair value of securities gains and losses with share prices. In particular, the author compares these results with the results of the correlation that considers historical costs rather than market fair values. The analysis intend to provide an alternative view to the critics for which investment decisions should not be taken considering fair value estimations given the low reliability of this method. For what regard investment securities, results confirm the thesis and fair value estimates have more explanatory power than historical costs. This is not true for securities gains and losses and their fair value cannot be considered value relevant because of two reasons: (i) estimating errors are too large for gains and losses; (ii) The problem of correlated omitted variables (such as unrecognized gain and losses of other assets and liabilities). The latter problem is the same faced by Nelson (1996) in the relevance analysis of fair value estimates of financial instruments in the valuation of the market value of banks' common equity. The model, which refers to 1992 and 1993 US banks' data, differs form other studies because the author considers the changes in the differences between fair value (market value) and book value. However, results do not confirm the value relevance of fair value estimate. In the conclusions, Nelson explains that the value relevance of investment securities proved in other prior studies (Barth, 1994; Petroni and Wahlen, 1995[45]) comes from the omission of proxies that control for future profitability.

Contrary to Nelson (1996), results of the work of Eccher, Rames and Thiagarajan (1996) are consistent with Barth (1994). Considering fair value disclosures of investment securities for the same time period, they find that the regressions of market-to-book ratios on the differences between fair value and book values are value-relevant. They also test the incremental value-relevance by comparing historical cost variables and fair value ones with a

[44] *Chapter 1, paragraph 1.2.1, page 28.*

[45] *For further information, see Nelson (1996).*

benchmark model; results suggest that historical cost variables provide more value-relevant information.

Off balance-sheet items – Derivative Instruments

Negative results of value relevance test for securities gain and losses in Barth (1994) have been justified by the possibility that other correlated and omitted variables could offset them. Barth states that among these omitted variables there could be off-balance sheet items. Different researches try to solve this problem by controlling explicitly for the effect of these items. Nelson (1996) includes in the empirical model that study the relation between market value and book value of banks' common equity with fair value estimate of financial instrument, also a variable that account for the net fair value of off-balance sheet items. A first concern comes from the definition of the sample and the analysis of available data. As author explains, the poor quality of disclosures of such instruments forces her to assume the most likely interpretation of data but, in this way, measurement errors cannot be excluded[46]. Moreover, results show that off-balance sheet items fair value estimates are not value relevant. This finding is partially in line with the one of Eccher et al. (1996). They distinguish two different kind of off-balance sheet instrument: (i) credit-related instrument and (ii) market related instrument. If the first ones have the same measurement and disclosure problems reported by Nelson (1996), the latters are considered by the authors "free from ambiguities" and are for this reason included in their empirical model. Results suggest that off-balance sheet fair values are value relevant only in limited settings.

Negative results relative to fair value estimate of off-balance sheet items have been founded also by Barth, Beaver and Landsman (1996). Fair value estimates appear to have opposite signs on firm values rather than the predicted ones. Moreover they appear to be statistically insignificant. Differently to all these studies that do not find value relevance of off-balance sheet derivatives, Venkatachalam (1996), after the adoption of the Statements of Financial Accounting Standards No 119 "Disclosure about Derivative Financial Instruments and Fair Value of Derivative Instruments", studies the effect of the new regulation on the value relevance of Derivative Instruments in equity valuation. Accordingly to other authors (Nelson, 1996 and Eccher et al., 1996), Venkatachalam blames the ambiguity of the fair value disclosures under SFAS 107 on the insignificance of the results obtained in previous works. He argues that the SFAS 119 aims to improve transparency by imposing banks: (i) to identify the purpose for which derivative instruments are used (trading, hedging, others); (ii) to

[46] *In order to preserve the reliability of the work, Nelson re-estimates all the regressions excluding off-balance sheet variable. For further info, see Nelson, 1996, p.167.*

indicate whether the derivatives represent a net asset or a net liability position; (iii) to provide disaggregated information for fair value and contractual amounts of derivatives. The author explains that these additional requirements should allow researcher to study more accurately the value-relevance of fair value of derivatives instruments in equity valuation so, in order to test this hypothesis, he performs a cross-sectional analysis. Positive regression coefficients, in contrast with prior studies, provide evidence of the usefulness of derivatives fair value for valuation purposes.

A possible restriction to the work of Venkatachalam is highlighted by Ahmed, Kilic, and Lobo (2006), whom argue that the author, by aggregating disclosed and recognized derivative financial instrument, imposed also to their coefficients to be the same, limiting in this way the reliability of the model. Using a cross-sectional valuation model, they provide evidence of the value-relevance differences of disclosed and recognized derivative instruments, suggesting authors to consider also the problem of possible different pricing implications for disclosed and recognized derivative instrument.

Loans

Lending is one of the inherent activities of a commercial bank and, for this reason, loans portfolios constitute their largest portion of investments. Loans are recognized at the disbursement date at their Fair Value while they are measured at the amortized cost (in the case of long terms loans)[47]. In particular, loans are assessed to identify if there is evidence of possible impairments. As a rule, every credit is valued in order to assess if it constitutes a "Performing" or a "Non Performing" loan. In order to estimate the percentage of loss, the first are subject to collective credit risk measurement while the latter are individually measured to determine the credit adjustment. These adjustments – both individual and collective – are recorded in the Income Statements as allowances and contribute to form a loan loss reserve in the bank's balance sheet.

Lancaster, Hatfield and Anderson (1993) study the market reactions after the announcement of an increase in loan loss reserves. Through the analysis of 18 U.S. banks between 1980 and 1986, the authors find that investors negatively assimilate the news of such increase and stock prices tend to decrease. Furthermore, the positive effect of an increase in cash flows due to tax saving seems not enough to counterbalance the negative one. This finding is recognized by Lancaster, Hatfield and Anderson (1993) as a proof that investors interpret higher loan loss reserves as a "managerial signal" of: an increase in banks' loans

[47] *The focus is on long-term loans that are measured at amortized cost. Other kinds of loans are measured at historical cost. For more information see Chapter 1, par. 1.2.1, p. 28.*

portfolio riskiness; or a change in supervisory policy. In contrast with this research, Whalen (1994) tests the information provided to investors by changes in Non Performing Loans, Loan loss provision and loans charge-off. The first and the latter give information about future loans losses and are for this reason negatively related with future cash flow, stock returns and earnings. On the other hand, authors find that, after having considered Non Performing Loans and Loans charge-off changes, an increase in loan loss provision is considered as "good news" rather than negative ones. Whalen (1994) describes this result as in line with prior studies on signalling literature (Akerlof, 1970; Spence, 1973; Grossman, 1981; Milgrom, 1981)[48]. Finally, the author suggests that his study contributes to the value-relevance debate, having provided evidence of the informational content of balance sheet and footnote disclosures.

Nelson (1996) and Eccher et al. (1996), in their studies about fair value relevance of financial instruments, also consider fair value of loans. As previously discussed for other instruments, Nelson (1996) finds that loans fair value estimates are not incrementally value relevant while even if Eccher et al. (1996) find that net loans fair value estimate are value relevant both in their full-sample and in some sub-sample regressions, they also find that historical cost variables provide a more value relevant information. Conversely, results of Barth et al. (1996) attribute value relevance to the fair value disclosure of loans in particular when are included information about: (i) interest sensitivity of loans and (ii) bank's financial health. Khurana and Kim (2003) argue that, in the case of loans, historical costs are more informative than fair value estimates because, since loans are not actively traded, their fair value comes from subjective assumptions and valuations method. For this purpose, Nissim (2003) studies the reliability of loan fair values, testing for the existence of some factors that could induce management to overstate them in order to positively affect market value. These factors are recognized by the author as: (i) small loan portfolio; (ii) low regulatory capital, asset growth and liquidity; and (iii) deterioration in the credit quality (Nissim, 2003, p.374). Accordingly, Huizinga and Laeven (2012) find that distressed banks take advantage of managerial discretion over loan loss provisioning in the attempt to increase their book value, which enable them to meet regulatory capital requirements.

Differently from all other mentioned studies, Drago, Mazzucca and Trinca Colonel (2013) consider European banks in the analysis of the value relevance of loans fair values. The authors adopt a "price-levels" regression to study the relation between stock price and different accounting variables. In particular, one of these accounting variables checks the

[48] *For further information about the signalling literature, see Whalen, 1994 p.459*

difference between book value of loans and their fair value. Results show the incremental explanatory power of fair value estimates in relation to loan book values and are a proof of the value relevance of such estimations. As a consequence, Drago, Mazzucca and Trinca Colonel argue that findings of their study have important implications for banks, regulators and standard setters. First of all because bank managers should consider that investors react to fair value estimate of loans even if they are illiquid assets. Historical cost method does not seem the better alternative to evaluate loans and, for this reason, authors suggest to regulators and standard setters to look for different evaluation criteria.

2.2.2. Banks' capital structure

Banks are exacerbated by different kind of risks: in addition to credit risk, bankers have to cope liquidity, market and operational risks and, therefore, their management is one of the fundamental activities of a bank. If it is true that the more risks banks assume the higher will be risk-premiums and so profits, it is also true that this peculiarity could lead to various adverse selection problems that, at last, could drive the bank to liquidity and solvency crisis. As a matter of facts, this is what happened in the recent banking crisis: the biggest U.S. banks, conscious to be "too big to fail", continue to increase their leverage for years, until the end with its consequences[49]. Aside from moral hazard, it is capital the primary safeguard for a bank: it allows bankers to run their business with an adequate level of autonomy and, most importantly, without compromising bank's stability. Given this predominant role, both regulators and researcher have always paid attention on bank's capital: The first establishing stricter and stricter international capital requirements[50]; the second studying the impact of such requirement on banks' stocks market price, banks' value, profitability.

Cantor and Johnson (1993) analyse market reactions to capital ratio improvement for U.S. banking holding companies between 1990 and 1992. The capital ratio considered is made of the total capital (tier 1 and tier 2 capital) over the risk weighted assets. As authors underline, the improvement in capital ratio are associated with an improvement in the leverage ratio that diminish as soon as capital increase. These changes have a positive impact on stock market value that is greater, the lower the initial capitalization. In detail, while well-

---

[49] *For which regard the largest financial firms: Bear Stearns was bought by JP Morgan with U.S. government assistance; Fannie Mae & Freddie Mac were put into conservatorship; Lehman Brothers failed; Merill Lynch, Goldman Sachs and Morgan Stanley lost market confidence. (U.S. Financial Crisis Inquiry Commission, 2011, p.23.)*

[50] *See Chapter I, paragraph 1.1.2, page 20.*

capitalized institutions' prices react more to increase in capital rather than to assets reduction, this difference is not accounted for less capitalized institutions.

The question of how capital affects bank's value has been developed only during '90s and has been reviewed by Mehran and Thakor (2011) that, in their study, select two diametrically opposite theories[51]: The first has been proposed by Miller (1995) and considers capital structure as value irrelevant while the second is the one of Diamond and Rajan (2001) that suggest that capital negatively affect banks value. Between these two points, Mehran and Thakor (2011) try to answer the question in an acquisition context. They develop a model to understand how bank capital and value are related in a cross-section analysis. According to the authors, capital has both costs and benefits. The first are related to adverse selection and agency problems while benefits are due to: (i) high probability of survival for the bank that invests more time in monitoring loans (direct benefit) and (ii) enhanced value of the loan portfolio, due to the increased monitoring (indirect benefit). Given these effects, banks optimally choose their level of capital. Banks' acquisitions data give empirical support to the model that predicts a positive relation between capital and banks' value.

Altunbas, Manganelli and Marques-Ibanez (2012) in their study related to the role of bank's business model during Great Recession, assess the presence of a negative relation between bank capital and risk of distress during financial crisis: "high level of Tier 1 capital ex-ante the crisis generally decreases the likelihood of bank distress during crisis" (Altunbas, Manganelli and Marques-Ibanez 2012, p. 30).

The positive relation between capital and probability of survival is the core of the analysis of Berger and Bouwman (2013). In their paper they examine how capital affects bank's performance that are accounted in terms of probability of survival and market share (bank's share of aggregate total assets[52]). The analysis is conducted on U.S. banks' data from 1984 to 2010 considering: (i) different types of financial crisis (individually and has a whole) and (ii) normal times. Moreover, given bank's dimension, authors divide them in three different clusters: small, medium and large banks. Berger and Bouwman (2013) find that: first, small banks with high pre-crisis capital have more probability of survival to any financial crisis and in normal times as well. Differently for medium and large banks, having a high pre-crisis capital helps to increase probability of survival only in case of banking crisis. Second, pre-crisis capital also influences banks' exit: high capitalized banks are improbable

[51] *For further information about Miller (1995) and Diamond and Rajan (2001), see Mehran and Thakor, 2011, p. 1021.*

[52] *Berger and Bouwman, 2013, p. 148*

to exit with a government-assisted M&A. Lastly, higher pre-crisis capital increases bank's market share: in any financial crisis and in normal times for small banks; in case of banking crisis for medium and large banks.

The latest banking and financial crisis, with the failure of high leveraged banks, and the Basel III accord, that requires banks to detain capital of higher quality, reopen the question of the impact of capital structure on banks' profitability: critics argue that by imposing banks to detain high level of capital, regulators could undermine banks' profits. De Bandt et al. (2014) address the question looking for a significant relation between capitalization and ROE. The authors study 17 of the largest French banks over the period 1993-2012 and find that the two measures are positively correlated: an increase in capital lead to an increase in ROE. Moreover, de Bandt et al. (2014) explain that the effect on ROE is independent from the level of capital requirement constraints and from the method through which banks increase capitalization.

2.2.3. Diversification

In banking, as well as in any other industry, customers' preferences change over time, following the continuous development of new technologies and IT systems. Bank's customers ask more and more online services that allow them to send and receive payments, trade on capital markets and so on. As Hefferman (2005, p.99) declares, in order to survive, banks have to consider these changes as opportunities rather than threats, evolving themselves, together with customers preferences and new technologies and maintaining, in this way, their competitive advantage. As a matter of fact, even if some small banks still remain focused on their core traditional business, the most of banks offer a wide range of services from the traditional ones (lending and deposits) to the more diversified *non-bank financial services* (unit trusts/mutual funds, stockbroking, insurance, pension fund or asset management, and real estate services). Not only, a lot of banks offer also *off-balance sheet services* (such as credit cards, letters of credit, the issue of securities, fund management, advise activity on derivatives and securitization) which generate profits, in the form of fees, without appearing in banks' balance sheets.[53]

Given the magnitude of these changes, with the increased diversification of products offered, researchers start to investigate their impact on bank's value and risks. Among others, Stiroh (2006) conducts a portfolio analysis to evaluate how non-interest income affects equity market measures of risk (in terms of volatility and bank's market beta) and returns. The

[53] *Hefferman, 2005, p. 64.*

author collects and empirically studies United States banks' data from 1997 to 2004 finding that volatility of returns and bank's market beta have a significant and positive relation with non-interest income while, at the same time, this positive and statistically significant relation is absent for average returns. Stiroh (2006, p.1359) suggests that this combination is the result of internal agency problems or managerial incentives to expand newly business line that overexposed banks to activities that generate non-interest income.

Similar conclusions are the ones of Laeven and Lavin (2007) that conduct a study to assess whether a bank's range of activities has an impact on its market value. As authors explain, prior literature identified costs and benefits linked to diversification: if it could allow a bank to achieve economies of scope; diversification could also amplify agency problems. Depending on which of the two alternatives will prevail, there could be an increase or a discount in bank's market valuation. To test this issue, Laeven and Lavin (2007) collect data of 43 countries between 1998 and 2002 finding that market values are lower for banks that have high diversification in their activities identifying a diversification discount in their valuation. Although authors cannot infer a causality link between agency problems and diversification discount, they conclude that economies of scope are not sufficiently large to counterbalance costs of diversification.

Contrary to Stiroh (2006) and Laeven and Lavin (2007)'s inferences, Baele, de Jonghe and Vander Vennet (2007), in the attempt to assess the presence of a comparative advantage for diversified banks, find a positive relation between the degree of diversification and stock market value. They compute a panel study of listed European banks during the period 1989-2004, obtaining evidence that the market seems to anticipate future bank profits arising from diversification. In their opinion, on average, benefits coming from diversification should be higher than agency costs and, as authors argue, this is in contrast with previous finding.

Others lines of studies try to attempt the degree of risk generated by diversification. Lepetit et al. (2008) concentrate on European banking system between 1996 and 2002 to check whether there is a relation between bank risk and product diversification. Activities are divided in traditional and non-traditional based on the fact that they generate interest or non-interest income. Results point out that higher lever of risk are linked with banks that have more non-interest income activities in their balance sheet and this is true, above all, for small banks. A further analysis is conducted by dividing non-interest income into: fee and commission and trading income. While for the first it is confirmed the positive correlation with risk, it is not the case of the latter: trading activities seem to decrease risk for smaller banks.

Altunbas, Manganelli and Marques-Ibanez (2012) analyse the role of business model on bank's risk, taking as natural experiment the financial crisis. Results explain that, especially for riskier banks, customer deposits reduce bank distress during financial crisis while, on the contrary, market funding increases the likelihood of distress. Authors also show that some banks achieved large market-to-book prior to the crisis because of systematic risk rather than for managerial ability. In their work, Altunbas, Manganelli and Marques-Ibanez (2012) highlight that bank's business model described in terms of bank size, undercapitalization, degree of credit expansion and bank funding structure have implemented the financial crisis and that this supports prudential regulatory initiatives of Basel III.

Finally, also Bonaccorsi di Patti, Felici and Signoretti (2016), in an empirical analysis of Euro Area *Significant banks,* find that bank's main business influences their profitability. The Single Supervisory Mechanism Framework designates the European Central Bank[54] to supervise directly 123 banks which are defined as "Significant" on the base of: their bank size, their importance for a specific country or for the EU as a whole; their cross-border activities. In their work authors provide a simple approach to classify these banks into eight clusters on the base of their business model. The first two subsets of banks are Network banks and Public Development Banks then banks are classified on a combination of their core business (lending rather than diversified banks) together with banks' size and degree of internationalization. Among others findings[55] they evidence that, before the financial crisis, lending banks have higher profits than high-diversified institutions. Moreover, although authors specify that this result requires further investigations, analysing the evolution of profits through years, they highlight the presence of an high sensitivity to macroeconomic condition (i.e. GDP growth), that is higher for lending banks rather then for diversified ones.

2.2.4. Other issues

Two different lines of studies refer to the development and transmission of information. The first, attain the role of Rating assigned to banks by Credit Rating Agencies. Although these agencies are often criticized for scarce transparency, their opinions still have a prominent role in financial markets. The second line analyses the value relevance of the IFRS adoption that particularly influences banks' financial statements.

---

[54] *Before the introduction of the SSM, National Competent Authorities were charged of the bank's supervision. After the introduction in November 2014, while the "significant banks" are directly supervised by the ECB, the others still remain under the supervision of the NCAs in cooperation with the ECB (Bonaccorsi di Patti, Felici and Signoretti, 2016).*

[55] *For further information, see Bonaccorsi di Patti, Felici and Signoretti, 2016.*

Credit Ratings changes

As explained by Schweitzer et al (1992), regulators carefully monitor and supervise banks in order to promptly recognize distressed institutions and avoid banks failure. Given the rigid regulatory requirement, also in terms of information supply, to which banks are subject, one can argue that changes in credit rating does not provide additional information to the ones already integrated in share prices. Schweitzer et al. (1992) study this hypothesis comparing it with the alternative that regulators have some information about distressed banks that do not disclose to the public in order to preserve a liquid market for their financial instruments. Empirical evidence from United States' banking holding companies, produced by the authors, confirms this latter case: In particular, bond downgrades seems to provide market with valuable information that were not included in market prices yet.

European banks are examined by Gropp and Richards (2001), which analyse abnormal return for market prices of both, stocks and bonds, controlling for the impact of expected and unexpected ratings changes. In detail, the research is on 32 European banks between 1989 and 2000 considering also the reasons of ratings changes and whether the major agencies (Moody's, Standard&Poor's and Fitch/IBCA) agree on such decisions. Strong effects of rating changes are found for equity prices and more importantly, reasons of the changes seem to be relevant: if the downgrade is due to an increase in risk rather than to a deterioration of earnings, there will be an increase in returns. Ultimately authors confirm Schweitzer et al. (1992) findings: even in this analysis, rating agencies provide useful information that, otherwise, remains non-public.

On the contrary, Bongini et al (2002) argue that credit rating agencies' have "the lowest discriminatory power between sound and insolvent banks" in the empirical analysis of financial institutions of East Asian Countries considering the period 1996-1998.

An analysis similar to Gropp and Richards (2001) is the one of Linciano (2004) that focus con the Italian banking system. He considers 299 ratings changes made by Moody's, Standard&Poor's and Fitch/IBCA during the period 1991-2003. Results show that when the reasons behind the rating changes are provided, the impact on share prices is stronger. The author does not deny the value of the information provided by rating changes but suggests that, in order to use the rating as informative instrument, rating agencies should be subject to stricter regulations.

Value relevance of IFRS for banks

In the attempt to harmonize different accounting processes, IFRSs affect different area of reporting: introducing extensive disclosure requirements, changing financial statements

presentation and how items are recognized and measured[56]. All these changes should increase transparency and accounting quality with the effect of a greater comparability of financial statements that, in turn, should allow the realization of a wider access to investment capital in the European Union. Value relevance studies analyse the correlation between financial information and market values therefore they are described by Agostino et al. (2011) as a good proxy for accounting quality. In their study, the authors test the value relevance of IFRS accounting measure to the market value, considering 221 European listed banks from 2000 to 2006. In order to control for individual and country characteristics (legal and financial systems, tax and financial reporting alignment), they conduct a panel data regression clustered by countries. Results confirm that value relevance of earnings increased for the entire sample with the largest effects in Germany and Italy. Agostino et al. (2001) comment that it is consistent with the additional disclosures required by IFRS. On the contrary, authors do not find a significant influence of book value on stock price. Moreover, results differ between small and large banks and between rated and non-rated banks suggesting that there could be a problem of opaqueness that explains the low relevance of book value. Analysing also the legal form, Agostino et al. (2001) conclude that the introduction of IFRS improves the value relevance of earnings and book values for more transparent intermediaries (large, rated and public limited banks).

2.3. Banks' market values analyses

Studies presented so far evidence the impact on bank's measures of value of different bank's characteristics focusing on one single issue per time. Another kind of studies aims to point out what is reflected on either changes in share prices or market-to-book ratios, trying to understand why they are so different across banks. Particularly, studies included in this paragraph consider different banks' characteristics without single out one peculiar aspect.

A first empirical study refers to the relation between bank's stocks returns and some financial statements information that may affect bank risk. The study is conducted by Cooper, Jackson III and Patterson (2003) considering a sample of 213 US publicly traded banks holding companies in the period between June 1986 and December 1999. The authors regress quarterly banks' stock returns with quarterly changes of financial statements variables. Some of these variables, namely earnings, noninterest income, loan loss reserve, leverage and standby letters of credit are correlated with future bank stock returns and provide useful indication on their forecast. On the contrary, book-to-market and bank size appear not

[56] *Ernst&Young, 2013.*

significant in forecasting the cross-section of bank stock returns. Finally, authors test whether the cross-sectional predictability is due to investors' under/over reaction to changes in banks' fundamental variables or to increase in bank's risk. They conclude that in the case analysed investors under reactions prevail.

Another research, developed in terms of level of firm value rather than in terms of share returns, is the one of Ming-Li and Liang (2005) that try to understand which are the drivers of value and the reasons of the differences between Book and Market values. In particular, authors intend to provide evidence to the work of Trueman, Wong and Zhang (2000)[57] for which non-financial indicators have an incremental explanatory power on the market-to-book ratio. Authors analyse 32 listed commercial banks in Taiwan collecting data from the first quarter of 1996 to the last quarter of 2002. Following the work of Trueman, Wong and Zhang (2000), they regress the Market-to-Book ratio to some income components: Gross Profits, Operating Expenditure (administrative & sales expenses) and Other operating Expenditure (depreciation, amortization and merger-related costs). Given that they intend to verify the incremental explanatory power of nonfinancial indicator, authors include, step-by-step, other three variables that account for bank's bad debts, Non Performing Loans Ratio and an Efficiency score. As expected, coefficients of bad Debts and NPL Ratios are both statistically significant and negative, anyway, authors state that from the comparison of the model that add only the NPL Ratios and the one that include only the Bad debts, the explanatory power of the first is greater than the second. More over, the incremental information that both variables provide is less than expected, in the full sample. A further analysis is conducted dividing the sample in three segments: old public banks, old private banks[58] and new private banks. Results suggest that Bad debts and NPL Ratios give more information about old private banks rather than public ones since that, for the first, estimated coefficients are more significant. Finally, the explanatory power of NPL Ratios is higher for new private banks rather than for other banks, and authors suggest that it could be due to investors' concerns about the reliability of new private banks' NPL ratios.

---

[57] *Trueman, Wong and Zhang (2000) analyze the Internet stock market. They start from the Ohlson (1995) postulate that relates the Market value to Book value and residual Earnings and decompose the last in the difference between Gross Profits, Operating Expenses and Non Operating Expenses. Furthermore, authors assume Non Operating Expense equal to zero and include in the regression a variable that account for other financial and non financial information. For further information, see Ming-Li and Liang, 2005, p.90.*

[58] *A bank is classified as "old" if it has been created before 1992. Ming-li and Liang, 2005, p. 98.*

Following the work of Cooper, Jackson III and Patterson (2003), also Romagnoli (2007) regresses bank's monthly stock returns with changes in financial ratios. The analysis contributes to the existing literature by analysing Italian listed banks from January 1997 to June 2007. Financial ratios, considered as annual percentage changes, describe five areas of the banking business: capitalization (Solvency ratio), business activity (Net Loans to Total Assets and Net Loans to Funding), credit quality (Loan Loss Reserve over Gross loans and NPL Allowances to Intermediation Margin), profitability (ROE, Recurring Earning Power, Dividends to Net Income, Net Interest Income over Earnings Assets and Cost to Income ratio) and liquidity (interbank assets to interbank liabilities). In order to derive conclusions, Romagnoli (2007) conducts three kind of analysis: first she confronts the average quintile returns, then there are univariate and multivariate regressions and, finally, the author adjusts the regressions of the previous step controlling for risk[59]. Overall results confirm that financial ratios impact on shares' returns. In detail, the author finds that capitalization ratios are the only ones that do not seem to be correlated with shares' returns. In accordance with authors that recognize the presence of a diversification discount[60], Romagnoli (2007) also finds that an increase in traditional activity leads to greater stock returns and vice versa. Moreover, strong changes in NPL allowances have a negative impact, given the fact that investors interpret them as a signal of deterioration in loans portfolio. Higher profitability ratios are associated with higher stock returns except for the case of Net Interest Income to Earnings Assets and dividends policies. Finally higher returns seem also to follow an increase in liquidity ratio. In order to further corroborate her results, the author makes the same analysis considering two smaller time frames: from 1997 to 1999 and from 2000 to 2003. Findings do not differ from the previous ones; moreover Romagnoli (2007) argues that the effects are stronger in the latest period. To conclude her analysis, the author confronts Italian results with Cooper, Jackson III and Patterson (2003)'s US results. As she highlights, the main difference attains capitalizations ratio that in US have a strong, positive and statistically significant impact on market returns.

Following the banking crisis started in 2007, the US Congress passed the Troubled Asset Relief Program (TARP) in the attempt to restore confidence on the US banking system by increasing bank's capital base. Jordan et al (2011) utilize a market-to-book value analysis to investigate results of the introduction of TARP program. Authors collect a total sample of

---

[59] *For the purpose of risk controlling, the author uses the Capital Asset Pricing Model and the Fama and French three factors model. Further info in Romagnoli 2007, p. 10.*

[60] *Supra, paragraph 2.2.3, page 50.*

6604 quarterly observations of US banks (bank holding companies and savings banks). The sample contains TARP recipients banks (576) and non-TARP recipients banks (6028). In the analysis, authors regress the market to book value ratio as a function of interest income coming from Earing Assets; non-earning assets; additional non-interest income; Tier1 capital and a Cost X-Efficiency ratio. Moreover, they include some dummy variables to control for exogenous influences. These dummies are constructed to consider: whether a bank is part of a banking holding company; if it is a savings banks; whether it is located in metropolitan area; bank's assets size; and, the quarterly periods considered[61]. Authors conduct two analyses, the first using a Fixed Effects Model and the second using a random-effects GLS panel regression in order to test for autocorrelation in the temporal effects. Results of these two analyses corroborate each other. Regarding the main purpose of the research, the effect of TARP funds on investors' expectation of future profits, they find that TARP recipients banks shown a decrease in share prices as long as they maintain TARP funds. Similarly for banks that detain a lot of non-accrual assets. On the other hand, accordingly with previous studies, low relative costs and high interest income on earning assets, Tier 1 ratio and Non-interest income are correlated with high market-to-book value.

The last study of this review tries to understand financial reasons behind the differences of market-to-book ratios in the Turkish banking sector. Macit and Topaloglu (2012) conduct this analysis, with data from the first quarter of 2007 to the fourth quarter of 2014. The sample is composed of 16 publicly traded banks, the majority of which are commercial banks, followed by participation and investment banks. As other authors did, Macit and Topaloglu (2012) regress market-to-book ratio with: net loans to total assets, non performing loans ratio, equity to total assets, return on assets, non-interest income to interest income, assets size and loans to total deposits. The authors also include dummies that control for each bank characteristics such as whether it is a commercial, participation or an investment bank and whether it is public, private or foreign bank. Again, results confirm initial hypothesis and the work of previous researchers. The market rewards commercial banks that are public and foreign. The strongest positive impact follows an increase in return on assets. Capital adequacy is also perceived as a positive indicator. A negative influence is given by bank size and non-performing loans ratio. Finally, accordingly with the findings of Jordan et al. (2011), they confirm that the higher is non-interest income the higher will be market-to-book value.

[61] *Jordan et al. 2011, p. 2051.*

Chapter III

Banks' Market-to-Book Value: Analysis for the Euro Area

Academic literature proposed in the previous chapter provides evidence of the relevance of some financial statements measures on investors' decisions. Although the argument is not free from criticisms, many authors describe the impact that certain financial amounts have on market value. Most of all, the latest studies focus on the banking sector for two main reasons: first, considering its prominent role on international economics development and the increasing consolidation of the sector; second, because the greatest portion of assets in banks' balance sheet are valued at market value. The latter, in particular, is the driver of studies on the value relevance of fair value estimates. Other studies reported focus on banks' capital structure and diversification as well as on the impact of rating changes and IFRS adoption.

The work presented in this chapter is an attempt to enhance the existing literature especially for which regards studies that aim to assess the presence of a correlation between banks' Market-to-Book ratio and different financial and accounting ratios (Ming-Li and Liang, 2005; Jordan et al., 2011; Macit and Topaloglu, 2012)[62]. This empirical research focuses on the Euro Area banking system, considering the period between 2006 and 2014. It should be particularly interesting to verify if and in which measure the value of a bank, measured by the Market-to-Book ratio, follows the trend of some bank's characteristics, such as profitability, efficiency, riskiness, business activity and capital adequacy.

The first paragraph describes the procedures followed in building up the sample and its peculiarities; financial ratios included in the model and the econometric methods used to develop the analysis. The second paragraph focuses first of all on Fixed Effects regression findings and it concludes with some heteroskedasticity controls.

3.1. Data and methods

The analysis considers commercial and cooperatives banks[63] registered in the Euro Area and for which financial data are available for the period between 2006 and 2014.

---

[62] *See Chapter 2, paragraph 2.3, page 54.*

[63] *Data have been exported also for "savings" banks however they have been excluded from the sample because of financial information shortage.*

3.1.1. A well-balanced sample

Financial Statements data have been exported from Bureau Van Dijk - Bankscope, a database that gives access to detailed financials in universal format so as to compare banks globally. The database contains not only banks' financial statements but also a wide range of other information including ratings, bank structures, news, M&A details, country risk etc. It has information on over 32 thousands public and private banks from all over the world with financial statements available for up to 16 years.

The first, rough, selection has been made through the search format, imposing the database to consider only banks that are (i) *Registered in the Euro Area*; (ii) *Active; (iii) Commercial, Cooperative or Savings;* and (iv) *Listed.* The result is a list of about ninety-one banks; for each of these the database creates, and allows users to export, a report containing all the available information. Moreover, the final user can personalize these reports selecting all the information that will be displayed. To the purpose of this work, the report of each bank is composed of: bank's overview, financial information (detailed balance sheet and income statements, financial ratios) and market information. Although the pattern of the report is the same for every bank in the list, differences still remain with regard to the time-horizon. Specifically, there could be one bank with ten years of financial info and others with only five years and this is the most important issue to address in order to obtain a balanced sample.

Another complexity regards market information. Even if these data have been included in Bankscope's reports, they are fragmentary for almost all the banks. For this reason, numbers of shares and year-end market prices have been exported from Thomson Reuters - DataStream. This database is specialized on data of equities, stock market indices, currencies, company fundamentals and economic indicators for 175 countries. Equities data are available in DataStream from the Initial Public Offering date and are updated every day. This means that, again, the time horizon is different for every bank, considering that every one: (i) has a different IPO date; (ii) could be delisted/suspended from transaction.

The nine years composing the time frame come from the comparison of:

i. The first year for which Financial and Market information are available for the majority of banks: 2006;
ii. The last year of Financial data availability: 2014.

After having determined the time-horizon of the analysis, other three controls have been adopted. The first check regards the presence of all the necessary variables. As a matter of fact, even if banks' Financial Statements are provided from 2006 to 2014, this does not mean that all the required variables are available for the entire period.

The second attains the presence of negative values in: (i) banks' equity book value; and in (ii) banks' net income. These two issues reflect the peculiarity of the years considered: the banking crisis started in the United States in 2007 reached also the Euro Area banking systems, additionally, it was exacerbated by the Eurozone Sovereign Debt crisis, with high concern especially for Greece insolvency status that threatened the stability of the entire Euro Area economy. The sharpening of the crisis and the increase of banks' regulation decreased both banks' equity and profits.

Two different approaches have been implemented to solve these issues. First, banks with negative book value have been excluded from the sample. They are four banks[64] for which it seems more appropriate a different analysis on a gone concern basis. Differently, banks with negative profits are maintained considering that: (i) it is a common element that affects approximately half of the sample; (ii) it occurs mainly during financial crisis years. In order to exclude biases in the results of the analysis, negative profits are considered equal to zero. This could be considered a strong simplifying hypothesis; in fact, a bank with huge losses could not be considered equal to a bank with zero profits; anyway, although this constitutes a limit of the work, it could be reasonably accepted, as the aim is to study the correlation between positive profits and banks' market-to-book ratios. Hence, in order to infer the nexus between these two variables, excluding at the same time the presence of biases, it could be admissible to adjust negative values differentiating only among profitable banks and unprofitable banks.

A further sample-selection criterion regards banks' main business. Although in the search form there have been selected only Commercial, Cooperative and Saving banks, some of the exported ones are specialized in leasing and investment activities. These banks have been excluded from the sample in order to obtain a homogeneous final sample.

After all these checks, the dimension of the sample decreased from ninety-one to fifty-two banks[65]; particularly, we excluded all *Saving banks*. Table 1 shows banks distribution across Euro Area countries, distinguishing between Commercial and Cooperative ones. France and Italy contribute the most to the sample composition, followed by Austria, Spain, Germany and Slovakia. French banks are mostly Cooperative Banks and they represent more than half of cooperative banks, the others are Italian and Austrian.

---

[64] *Namely: Bnp Paribas, negative book value in 2006; National Bank of Greece and Piraeus Bank negative in 2011 and 2012; Eurobank Ergasias negative in 2012.*

[65] *See annex for the list of all banks in the sample.*

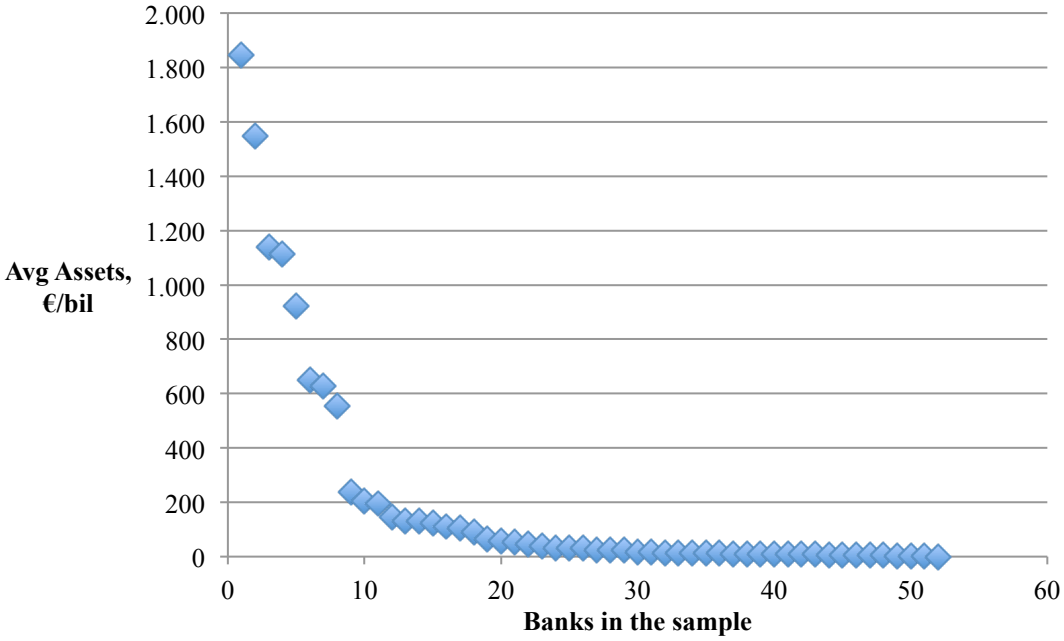
Table 1: Banks distribution by country and business activity.

Banks	AT	CY	DE	ES	FR	GR	IE	IT	LT	MT	PT	SK	Total
Commercial	4	1	3	5	2	2	1	7	1	1	1	4	**32**
Cooperative	2				12			6					**20**
Total	6	1	3	5	14	2	1	13	1	1	1	4	**52**

Source: author's elaboration.

Nonetheless the adjustments described, the sample seems to be affected by high variability of its elements. Although the fifty-two banks considered are principally involved in commercial activities, they still differ in term of size. This difference could lead to a difference also in their assets compositions: the larger is a bank, the higher is the likelihood to be a more diversified bank. Chart 1 shows the evolution of banks' average assets in the time frame of the analysis: the variability of assets is L-shaped, meaning that it is concentrated approximately around the first ten banks. These set of banks include the largest ones, with average assets from 1.800 billion of euro (Deutsche bank) to 555 billion of euro (Banco Bilbao Vizcaya Argentaria). Following banks appear to be more concentrated, with average assets value between 238 billion of euro (Deutsche Postbank) and 106 billion of euro (Raiffeisen Bank International). The last group of banks shows the lowest variability with average assets from 89 billion of euro (Banco Comercial Português) to 0,86 billion of euro (Siauliu bank).

Chart 1: Banks' Average Assets between 2006 and 2014



Source: author's elaboration

3.1.2. Financial Ratios analysed

In order to obtain evidence of the impact of different bank managements' decisions, a financial statements analysis of the banks have been conducted taking into account different areas: profitability, efficiency, riskiness, business activity and capital adequacy.

Ratios are similar to those used in selected studies[66]. The main difference across these studies attains the approaches through which they proceed. Some authors (Ming-Li and Liang, 2005; Jordan et al., 2011; Macit and Topaloglu, 2012) develop the research in terms of firm value, explaining cross-sectional differences in share prices with the final aim of determining what is reflected in those values. Others consider changes in share prices with the purpose to provide evidence of what is reflected in stock returns over a specific period of time (Cooper, Jackson III and Patterson, 2003 and Romagnoli, 2007).

The present analysis could be included in the first group as it aims to verify: (i) if financial ratios have an impact over a value measure such as the Market-to-Book ratio; (ii) if that impact is positive.

The next sections describe all ratios used in the analysis.

Market-to-Book ratio

Since the majority of banks' assets and liabilities are apprised at market value, market-to-book ratio is particularly used in banks' valuation[67]. Banks with high market-to-book ratio are expected to continue in creating value for shareholders despite of companies whose ratio is low, that can be considered either mispriced in the market or expecting not to create value. For this reason, this metric constitutes the dependent variable of this analysis with the aim to establish if market valuation could be correlated to banks' financials. Market data exported from DataStream have been particularly useful; indeed, share prices at the year-end constitute the market values while the equity values arising from banks' financial statements divided by banks' number of shares at the year-end represent the book values. Chart 2 shows the evolution of Banks' average market-to-book ratio between 2006 and 2014. It should be noted the strong reduction in the ratio between 2007 and 2008, when the financial crisis began. As a matter of fact, considering that this measure is computed through market values, it must be bear in mind that it might be influenced by external, systemic factors. To this purpose, the

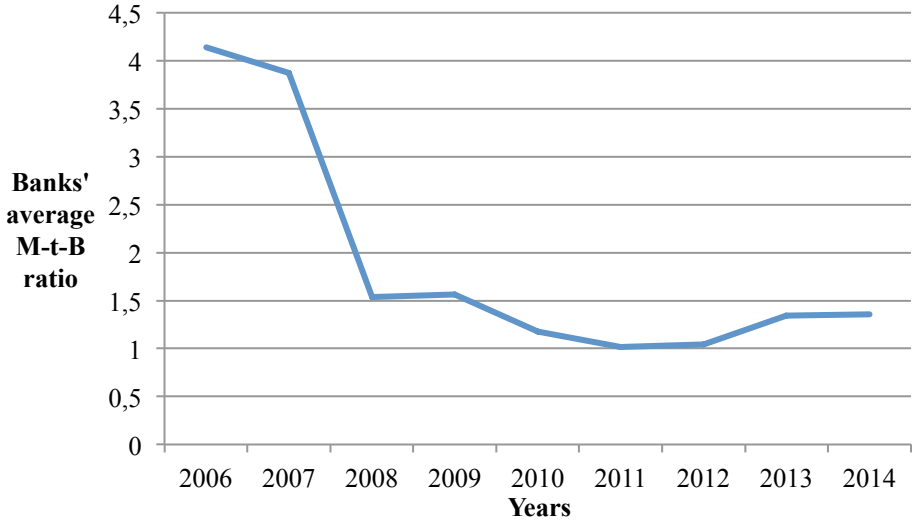
---

[66] *Chapter II, paragraph 2.3, page 54.*

[67] *The "Market-to-book ratio" is a financial ratio used to evaluate a company by comparing its shares' price, which constitute the market value, with the company's book value of equity arising from the difference between company assets and liabilities.*

analysis will be integrated by a "control variable" that accounts for market trends in the period of analysis.

Chart 2: Banks' average Market-to-Book ratio between 2006 and 2014



Source: author's elaboration

Profitability

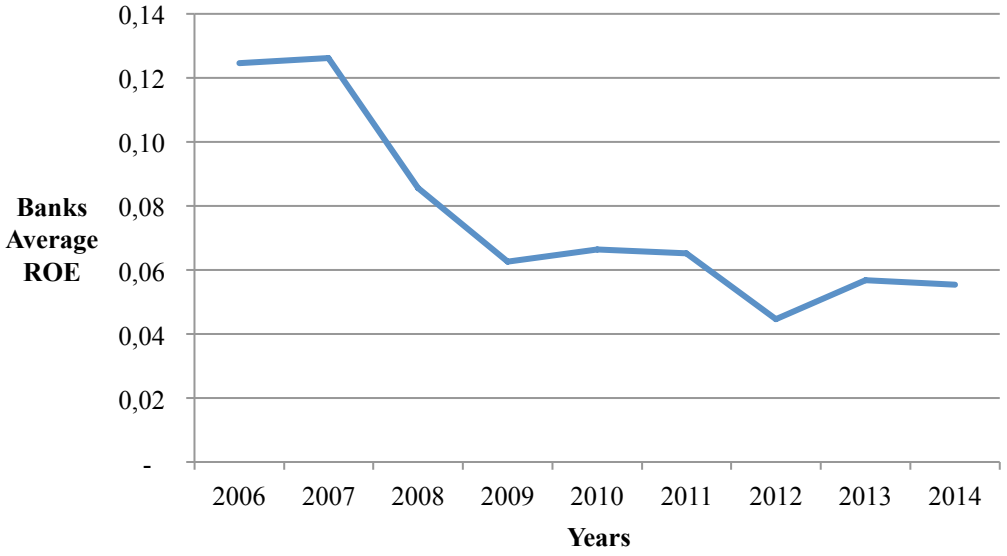
This first category of ratios concerns the ability to generate earnings. Ratios in this category are expected to positively affect the value of a bank: the more the bank is able to generate profits, the more the market should value it. For this reason, banks that have an higher profitability but a lower market-to-book value ratio are potentially undervalued, while banks having an higher market-to-book ratio but a lower profitability are potentially overvalued. Previous studies confirm this expectation with profitability ratios that have a positive impact in both value measure and returns.

The present analysis considers two different profitability ratios, Return on Equity (ROE) but also the ratio between the Interest Income and the Earning Assets (herein after Net Interest Margin – NIM).

With regard to the first, as previously clarified, the aim of this work is only to obtain evidence of the impact of positive profits, as it regards the valuation of banks on a going concern basis. Unfortunately, approximately half of the banks in the sample obtain negative profits during financial crisis year and this could induce some biases in the analysis outcomes. Although economically it is not admissible to match banks with negative and zero profits, considering the final aim of this analysis and in order to preserve statistical significance of the model, negative profits have been adjusted to zero, differentiating only among profitable banks and unprofitable banks. Chart 3 evidences the decrease in ROE during 2006-2014. Particularly through this graph it is possible to observe two negative trends that drive ROE

drops: the first in 2007-2008, when the real estate bubble blew up leading to the US and world banking crisis. The second during 2011 with the lowest peak reached in 2012 and linked to the worsening of the European Sovereign Debt Crisis.

Chart 3: Group-mean ROE between 2006 and 2014



Source: author's elaboration

Given the peculiarity of the data set used in this analysis, the graph loses a lot of information that make it impossible to infer anything about the evolution of ROE among each bank. Despite this constraint, it helps to understand when ROE reached the lowest value, showing that ROE falls could be linked to the recent financial crisis.

Table 2 offers some summary statistics of ROE and NIM. Both variables have a minimum value around zero. It should be noted that NIM values about Mean, Median and Maximum are all lower than ROE ones. It is normal considering that Net Interest Margin, the first source of profits for banks, considers neither Fees & Commission nor Trading Income. On the contrary, both this non-operating profits are part of the Net Income, which is in turn reflected into ROE ratio. As the sample contains information about each of the banks in every year, the degree of dispersion around mean is computed in three version: (i) an "overall" Standard Deviation, that considers all the 468 observation; (ii) a "between" S. D. calculated after having computed each bank's temporal mean; (iii) a "within" S.D. calculated after having computed cross-sectional means for every year of the time frame.

Table 2: Summary statistics, using the observations 1:1 - 52:9 for the variables ROE and NIM

	ROE	NIM
Mean	0,0686	0,0200
Median	0,0602	0,0188
Minimum	0,0000	0,0000
Maximum	0,3492	0,0430
Standard Deviation	0,0574	0,0073
S. D. Within	0,0507	0,0033
S. D. Between	0,0321	0,0066
5% percentile	0,0000	0,0091
95% percentile	0,1845	0,0336
Missing Observation	0	0

Source: author's elaboration

Efficiency

The economic crisis, the decline in the real estate market and the introduction of the new technologies, with customers that are more and more comfortable using on-line services, considerably decreased banks' profits. This reduction forced banks to be involved in a continuing attempt to reduce operating costs in order to maintain efficiency.

Cost to Income ratio has been introduced to check the impact of efficiency (inefficiency) on banks value. To obtain the ratio, operating expenses are divided by operating income (Intermediation Margin), so, an increase in this ratio could be due to expenditures increase and/or to a decrease in income; in other words, to a worsening of bank efficiency. Vice versa, a decrease in Cost-Income ratio is due to bank's efficiency increases. There could be also the case in which operating costs decreased (ex. due to employment contraction) without affecting efficiency. In this situation, if the Cost-Income ratio did not decline, or if it reduced very slowly, there could mean that there is also a reduction in operating income. The figure drawn is a very distressed bank and, high Market to book ratio should only mean overvaluation. In theory, the more a bank is profitable, even maintaining efficiency, the higher should be the Market to Book ratio.

A first analysis could be conducted through the summary statistics in Table 3. It is important to note that the mean is lower than one, suggesting that, on average, for the banks of the sample operating costs are lower than operating income. The Minimum value is reached by Raiffeisen Bank International AG in 2013, while the Maximum by Allied Irish Banks in 2012. Table 3 shows also information about Deviation from mean value, for the overall sample, between each of the banks and within them.

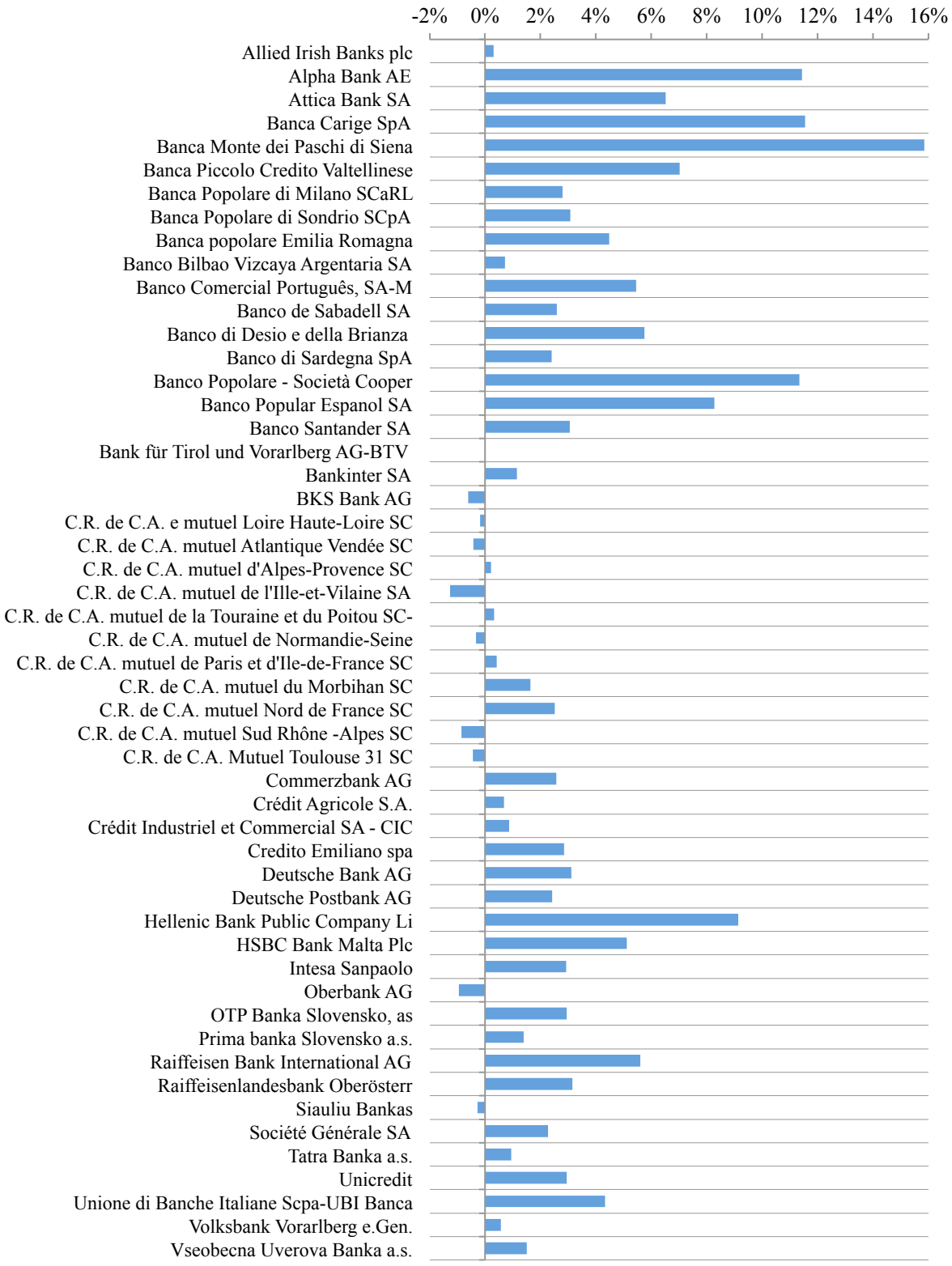
Table 3: Cost-to-Income summary statistics, using the observations 1:1 - 52:9.

	CIR
Mean	0,8505
Median	0,7418
Minimum	0,2783
Maximum	7.0113
Standard Deviation	0,5147
S. D. Within	0,4326
S. D. Between	0,3161
5% percentile	0,5351
95% percentile	1,4726
Missing Observation	0

Source: author's elaboration

Although the summary statistics provided by Gretl software give also details about Median value and percentiles, they do not infer a lot about the evolution of the Cost-to-Income ratio in the period considered. To this purpose, the Compound Annual Growth Rate (herein after CAGR) has been calculated for the Cost-to-Income ratio of every bank in the sample, from 2006 to 2014. As it is possible to appreciate from the Chart 4, even if the Cost-to-Income is on average lower than one, it has generally observed an increase in the period 2006-2014. The highest boost is the one of the Italian "Monte dei Paschi di Siena", with a CAGR near 16%. It is followed by the Greek "Alpha Bank" and the two Italians "Banca Carige" and "Banco Popolare" that have all experimented a decline in their efficiency. On the other side, nine banks of the sample have reached negative values of CAGR even though this falls have percentage lower than the previous mentioned. The best result is accounted by the "Caisse régionale de crédit agricole mutuel de l'Ille-et-Vilaine" a French cooperative bank with a CAGR of -1,26%. A rise in efficiency has been scored also by the Austrian "Oberbank" and "BKS bank" and by other French cooperatives.

Chart 4: Cost-to-Income CAGR between 2006 and 2014.



Source: author's elaboration

Riskiness

The largest portion of banking risk is represented by credit risk. This kind of risk is intrinsic to the business and, for this reason, it is a constant source of discussions and regulations. As clarified in the previous chapters of this thesis, regulators aim to provide

banks of an adequate level of capital in order to cope all their risks and, credit risk in particular[68].

The degree of riskiness of a bank comes from the quality of its investments but also from the coverage policy adopted. Given the fact that loans portfolio constitute their largest portion of investments, banks are continually involved in the assessment of expected and unexpected losses that could arise from that portfolio. As a rule, every credit is valued in order to assess if it constitutes a "Performing" or a "Non Performing" loan. In order to estimate the percentage of loss, the first are subject to collective credit risk measurement while the latter are individually measured to determine the credit adjustment. These adjustments – both individual and collective – are recorded in the Income Statements as allowances and contribute to form a loan loss reserve in the bank's balance sheet.

Previous studies, reviewed in the literature chapter, about loans fair value estimate and about the market impact of an increase in loan loss reserve highlighted that the effect of changes in credit adjustments and in loan loss reserve are not obvious. A high coverage from Non-performing Loans could be desirable because it could be an index of increase in prudence; on the other side, it could also mean that there could be a worsening in the quality of the loans portfolio. Moreover, allowances increase has a negative impact on banks' profitability.

Given the scarce availability of data about Non Performing Loans, the NPL Ratio could not be included in the analysis, where the stock index Loan loss Reserve to Gross Loans (LLRGL) has been considered as a measure for the quality of investments. Table 4 provide some descriptive statistics of this ratio.

Business Activity

The fact that commercial banks - on which this study focus – are mostly involved in lending activities with the over mentioned consequences that their loans portfolio constitute their largest portion of investments, it does not mean that banks do not differ substantially from each other. On the contrary, their mix of investments could be highly diversified. Although some small banks still remain focused on traditional activities, the majority of banks are getting closer to an universal bank model offering, together with traditional products also a wide range of non bank financial services and off-balance sheet services. Prior literature obtains controversial evidence of the impact of non-traditional activities over bank risks, profits and, finally, market reactions[69]. Although some authors find that there is a

[68] *Chapter I, paragraph 1.1.2, page 20.*

[69] *Chapter II, par 2.2.3, page 54.*

positive relation between non-interest income and market value, other authors identify a market discount for banks that are more diversified. Debate is still open so, in order to control for the impact of diversification, the ratio Net Loans to Total Assets (NLTA) is included in the analysis. Table 4 also shows summary statistics of this ratio.

Table 4: Summary statistics, using the observations 1:1 - 52:9 for the variables LLRGL and NLTA

	LLRGL	NLTA
Mean	0,0400	0,6575
Median	0,0294	0,6837
Minimum	0,0021	0,1033
Maximum	0,2841	2,1934
Standard Deviation	0,0348	0,1691
S. D. Within	0,0271	0,0919
S. D. Between	0,0238	0,1464
5% percentile	0,0129	0,3093
95% percentile	0,1034	0,8313
Missing Observation	0	0

Source: author's elaboration

Capital adequacy

As discussed in previous chapters, capital represents the primary safeguard against risk exposures and for this reason regulators impose stricter and stricter requirements in terms of capital of best quality. Although part of the researches reviewed in the second chapter argues that capital is value "irrelevant" or that it negatively affects banks profitability, other studies confirm the positive impact of capital on banks value. Moreover, some studies provide evidence that banks with higher capitalization are more likely to survive to financial crises. Tier1 Ratio should take into account the impact of higher degree of capitalization. Particularly, high Tier1 Ratios are expected to positively affect the Banks' Value.

Unfortunately, information shortages about the Tier 1 ratio cause the sample to decrease to thirty-seven banks; Tier 1 impacts has been studied in a second model which considers the restricted sample. Table 5 provides descriptive statistics for the thirty-seven banks composing this sub-sample with data collected from 2006 to 2014.

Table 5: Summary statistics, using the observations 1:1 - 37:9 for the variable T1R.

	T1R
Mean	9,5463
Median	9,3600
Minimum	2,1000
Maximum	19,9300
Standard Deviation	2,6964
S. D. Within	2,3720
S. D. Between	1,5198
5% percentile	5,7000
95% percentile	14,3000
Missing Observation	0

Source: author's elaboration.

3.1.3. Econometric model and methods

The sample described is a statistical structure where time series and cross sectional units are combined together in a dataset known as panel of data or longitudinal data. In this analysis the fifty-two banks are the individuals that compose the panel and for which the same quantities (financial ratios, market to book ratio) are measured over a specific period of time, from 2006 to 2014. Since that a panel data contains both information it allows to extend the analysis and solve some multicollinearity problems. Moreover, depending on the econometric techniques used, panel data help to remove some omitted variables problems that could bias regression results (Brooks, 2008). The first representation of this dataset is the equation:

$$\frac{MV}{BV}_{it} = \alpha + \boldsymbol{\beta R_{it}} + v_{it} \quad (1)$$

Where $\frac{MV}{BV}_{it}$ is the Market-to-book ratio that constitutes the dependent variable of the regression, calculated for every bank *i* and at any time *t; α* is the intercept term; **β** is a k × 1 vector of parameters on the explanatory variables **R** that is in turn a vector 1 × k of Financial Ratios calculated for every bank *i* and at any time *t*. Finally v_{it} is the error term. Moreover, in order to exclude external influences, the model includes another controlling variable "ESTOXXB" which accounts for the trend of the "Euro STOXX banks" index from 31/12/2006 to 31/12/2014. Data, provided by the European index specialist STOXX Ltd, should account for market trends in the period of the analysis. Especially, this index considers the Euro Area banking sector. In order to account for other issues that could have an external influence over the Market to Book ratio, also the variable "Euribor" could be included in the analysis controlling for the trend in the official rate from 31/12/2006 to 31/12/2014. Anyway,

this last two variables appear to be highly correlated, with $\rho_{xy} = 0{,}80$ and, for this reason, only the first has been implemented in the next two equations.

The previous equation can be rewritten in an extended version so as to obtain the regression equation (2).

$$\frac{MV}{BV}_{it} = \alpha + \beta_1 ROE_{it} + \beta_2 NIM_{it} + \beta_3 NLTA_{it} + \beta_4 LLRGL_{it} + \beta_5 CIR_{it} + \beta_6 ESTOXXB_{it} + v_{it} \quad (2)$$

With $i = 1 \dots 52$ and $t = 1 \dots 9$. The model considers all the banks for the nine years of the time horizon but without accounting for the impact of Tier 1 Ratio.

Given the fact that banks considerably differ also in terms of size, results will be shown for the whole sample and for two sub-samples composed of about twenty banks. These sub-samples have been obtained considering the median of the Average of Total Assets. The first, includes banks whose Average of Total Assets is contained in the range 0,86 billion – 27,88 billion. The second sub-sample is composed of banks with an Average of Total Assets from 27,88 billion to 1891 billions.

As previously specified, the introduction of Tier 1 ratio caused the sample to decrease from fifty-two banks to thirty-seven. To preserve the information provided by the banks for which Tier 1 data are not available, this last variable has been considered only in a second, restricted model, that aim to study the impact of capital on market-to-book. This model can be described by the regression function (3):

$$\frac{MV}{BV}_{it} = \alpha + \beta_1 ROE_{it} + \beta_2 NIM_{it} + \beta_3 NLTA_{it} + \beta_4 LLRGL_{it} + \beta_5 CIR_{it} + \beta_6 T1R_{it} + \beta_7 ESTOXXB_{it} + v_{it} \quad (3)$$

With $i = 1 \dots 37$ and $t = 1 \dots 9$. The whole sample has been split in two halves considering the Average of Total Assets. The median distinguishes between the first subsample, which includes banks with Average Total Assets up to 63,35 billion and the second where the banks' Average Total Assets ranges from 63,35 billion to 1891 billion.

Econometric Methods

Once specified the sample characteristics and the econometric model to be estimated, the last choice attains the statistical estimation techniques to be applied. This choice depends first of all from the structure of the sample. It is possible to estimate a panel of data by using separate cross sectional regression or separate time series regressions but this are only

suboptimal solutions since they loose information about: (i) time series changes in the first case; and (ii) cross sectional variation in the second one. Another way to estimate coefficients of the explanatory variables considers the use of a pooled OLS regression but even this simplification implies the loss of all the additional information that panel structure furnishes: data must be stacked together so that observation on cross sectional units and on time series would not be distinguished anymore (Brooks, 2008). As explained by Wooldridge (2014) problems in exploiting this method are linked to some heterogeneity bias. Considering the *composite error* term:

$$v_{it} = a_i + u_{it} \qquad i = 1 \dots N; \qquad t = 1 \dots T$$

Where u_{it} is the *idiosyncratic error*, representing unobserved factors that change over time and affects the dependent variable, while a_i represents the *unobserved effects* and capture all the unobserved time constant factors that affect the dependent variable y_{it}. The limits of the pooled OLS estimations are linked to this term. One of the fundamental conditions to use the OLS estimators is that the error term is uncorrelated with the independent variables. Although it could be assumed that the idiosyncratic error u_{it} is uncorrelated with each explanatory variable, pooled OLS are still biased if the unobserved effects a_i are correlated with the explanatory variables.

Among other solutions to solve this heterogeneity problem, there are First Differentiation and Fixed Effect model (FE). Both use a transformation to delete the unobserved effect, a_i, from the regression. Moreover, along with a_i, any time-constant variables are removed from the regressions. Using First Differentiation, the unobserved effect is eliminated by differencing adjacent periods. Following, time series will be composed of $T - 1$ periods and the regression will describe the relation between Δy_{it}, the one-year change in the dependent variable, and Δx_{it}, the one-year change in every one of the explanatory variables.

The Fixed Effect model considers, for each unit i – i.e. for each bank – the average across time of each variable in the regression equation (dependent variable, explanatory variables and error terms) and then differentiate each variable with its within mean. For this reason the Fixed Effect model is also known as "within transformation". The important thing to consider is that the unobserved effects, which change only across each cross-sectional units, disappear after differentiation because the difference between each a_i and their within means – still a_i – are zero. Of course this is true for every time constant variable.

Another way to estimate a Fixed Effects model is through the Dummies Variable regression. Here the unobserved effects a_i are considered as parameters to be estimated for each of the cross-sectional units. With this interpretation, in order to estimate every intercept,

the regression equation must include along with the explanatory variables also a set of dummy variables that accounts for each cross-sectional unit. Regardless of the practical limit linked to panel data with a lot of cross-sectional units, for which the Dummy Variable Regression appears to be composed of too many explanatory variables, this method provides the same estimate of the "within transformation" method previously described (Wooldridge, 2014).

Differently from the two previous statistical methods, if the unobserved effect are considered uncorrelated with each of the independent variables, which is if:

$$Cov\left(x_{jit}, a_i\right) = 0 \quad \forall\, i = 1 \dots N; \quad \forall\, t = 1 \dots T \quad \forall\, j = 1 \dots k$$

then, the Random Effect Model could be considered. Wooldridge (2014) specifies that, if the model contains a set of controls that accounts for special characteristics of the cross-sectional units, it could be plausible that any unobserved effect does not cause correlation between the composite error term and the explanatory variables. This model does not completely delete the unobserved effects, but only a fraction of them which depends on the variances of a_i, u_{it} and on the number of years T. To proof, consider the composite errors v_{it}, which are serially correlated across time due to the presence of the term a_i:

$$Cov\,(v_{it}, v_{is}) = \frac{\sigma_a^2}{\sigma_a^2+\sigma_u^2}\,, t \neq s.$$

OLS standard errors ignore this serial correlation so, in order to deal with it, the Random Effect model uses a GLS transformation based on the variable λ in order to delete the serial correlation:

$$\lambda = 1 - \frac{\sigma_a^2}{\sigma_a^2+T\sigma_u^2}\,, t \neq s\,.$$

So, while the fixed effect model subtracts the time averages from each variable, the Random Effects model considers only a fraction λ of those time averages. The error becomes: $v_{it} - \lambda\overline{v_{it}} = (1-\lambda)a_i + u_{it} - \lambda\overline{u_{it}}$, and the correlations between the explanatory variables and a_i are contained by the presence of the parameter λ. Particularly, as λ gets close to one, the *unobserved effects* go to zero and the Random Effects estimators tend to the Fixed Effects estimator. The contrary if λ tends to zero (Wooldridge, 2014). The Random Effects model supposes that cross-sectional units are a random sample of a large population (Marcellino, 2013) anyway it is not always possible to threat the sample of the analysis as a random one. Wooldridge (2014) suggests that in those situations it is better to consider each a_i as a separate intercept to be estimated for each cross-sectional unit, using the Fixed Effects model. On the contrary, using the Random Effects model means to consider the intercepts of each cross sectional units composed of a common intercept α plus a random variable a_i that is time-invariant and "measure the random deviation of each entity's intercept term from the global intercept term α" (Brooks, 2008).

Although the sample of banks previously described is part of a larger population, it appears to be too rush to recognize it as a random one. Moreover, it seems more conservative to consider plausible the correlation between the explanatory variables and *unobserved effects* a_i. For both reasons, this analysis adopts a Fixed Effects Model for the estimation of beta coefficients. This choice has been confirmed by the implementation of the Hausman (1978)'s test, which is an econometric test for the null hypothesis: "Random Effects model is consistent". This hypothesis is rejected in favour of the alternative Fixed Effects model.

Lastly, after having controlled for serial correlation, some other controls have to be taken in order to account for potential heteroskedasticity in errors[70]. Particularly, Arellano's robust standard errors for within-groups estimators have been considered as they have been demonstrated to efficiently deal with both heteroskedasticity and serial correlation (Arellano, 1987). The last section of this chapter expressly deals with heteroskedasticity problems.

3.2. Regressions findings

The two models described in the previous paragraph by equations (2) and (3) have been processed using Gretl, a free open-source statistical package for econometric analysis.

Regressions results provided by this software using a panel Fixed Effects method, contains, along with beta coefficients, standard errors, t-statistics, p-value and many other statistics, two different measures for the goodness of fit. Indeed, based on how the Fixed Effects methods have been computed, the model provides a LSDV R-squared and a Within R-squared. The first attains the Dummy Variable Regression method while the second considers time-demeaned data of the Within Transformation. As Wooldridge (2014) specifies, since that the dummy variables included in the first method explain much of the variability of data, the LSDV R-square is typically high.

Some preliminary clarifications must be done: first of all, due to the high variability of the banks in the sample, both models have three different specifications, for the overall samples and for their two halves, considering as discriminating factor banks' averages of total

---

[70] *Heteroskedasticity means the absence of homoskedasticity for which the variance of the unobservable error term u, conditional to the explanatory variable, is constant. It is one of the fundamental assumption for which the OLS Estimators are B.L.U.E (Best Linear Unbiased Estimators). Although heteroskedasticity does not cause the OLS estimators to be biased or inconsistent, the contrary holds for their variances and, since the OLS standard errors are based on these variances, they are no longer valid to justify t-test statistics, F-tests statistics and confidence intervals of linear regressions (Wooldridge, 2014).*

assets in the time horizon of the analysis. Secondly both models have been implemented by adding one variable at time in order to test their significance. This test considers p-value for the significance of the estimates and changes in the R-squared. Moreover, by adding one variable at time it is possible to control the effect that each variable has on others already implemented[71].

First results to be presented attain the equation (2), which does not consider the effect of Tier 1 Ratio in order to preserve the information provided by the banks for which these data are not available. Table 6 reports beta-coefficients estimated for the entire sample of 52 banks in the nine years of analysis. Columns from "A" to "E" describe results of the models that, step by step, add explanatory variables. It must be point out that the Within R-squared of these models are very low stating for the scarce ability of the models to explain Market-to-Book value changes. The measure slightly increases only in the column "E" that includes the controlling variable EuroStoxxBanks. Accordingly, the first four models of the table, does not have any significant predictor. P-values are all high meaning that the null hypothesis: "the real beta is equal to zero" cannot be rejected. P-value of the estimated beta coefficient of EuroStoxxBanks is statistically significant at 5% level.

Another problem regards the ability of the model to predict signs of beta coefficients. Column "A" includes as explanatory variables only ROE and Net Interest Margin, which are expected to positively affect the Market-to-book Ratio. Although this is verified for ROE, the estimated beta coefficient of Net Interest Margin has a negative sign, meaning that an average increase in the Net Interest Margin is correlated with a decrease in the Market-to-Book ratio. This negative relationship is maintained also in the following columns where Net Loans to Total Assets, Loan Loss Reserve to Gross Loans and the Cost-to-Income ratio are added one at time. Only in the column "E" with the inclusion of the controlling variable EuroStoxxBanks, the beta coefficient of Net Interest Margin becomes positive. Net Loans to Total Assets has always a negative sign meaning that the market should value more banks that are more diversified. Others concerns come from the signs of Cost-to-income beta coefficients, that are always positive. Considering that an increase in this ratio is due to a decrease in efficiency (due to either an increase in operating costs or a decrease in operating income), the fact that the beta coefficients appear with a positive sign could mean that inefficiency could be associated with higher market-to-book ratio, which is of course a misrepresentation. Finally, beta coefficients of Loan Loss Reserve to Gross Loans are always

[71] *It must be also considered that the aim of this analysis is to provide evidence of the correlation between financial ratios and market-to-book ratio without giving any inference about causality.*

negative, even if this relation appears to be statistically insignificant. The negative effect might means that the market negatively reacts to increases in Loans loss reserve, attributing them to a worsening in the quality of loans portfolio rather than to an increase in bank's prudence. In any case, due to the insignificance of the estimate, it is not easy to infer something on the reasons behind this relation.

All the problems described could be associated to either: high variability in data or heteroskedasticity problems that remain even using robust standard errors.

Table 6: Fixed effects model using robust (HAC) standard errors.
Full Sample, excluding T1R. Dependent variable: MTB

	A	B	C	D	E
Constant	-0,099	1,268	1,389	1,080	0,612
	(1,189)	(1,552)	(1,346)	(1,299)	(1,364)
ROE	32,873	32,671	32,475	33,030	30,392
	(22,952)	(22,745)	(22,935)	(23,732)	(25,135)
NIM	-13,263	-6,455	-7,924	-2,182	-3,067
	(67,0418)	(64,144)	(59,212)	(54,181)	(54,112)
NLTA		-2,265	-2,315	-2,325	-2,042
		(2,709)	(2,683)	(2,699)	(2,745)
LLRGL			-1,116	-2,212	-1,649
			(7,841)	(6,601)	(6,443)
CIR				0,242	0,245
				(0,459)	(0,449)
ESTOXXB					0,005
					(0,004)
LSDV R-squared	0,619	0,619	0,619	0,619	0,619
Within R-squared	0,099	0,101	0,101	0,101	0,102

N. of observation: 468 with 52 cross-sectional units. Time series length: 9 years. S. Deviation of dependent variable 7,63. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration.

In order to decrease the variability of the banks in the sample, the next two tables present Fixed-Effects regressions results considering the two halves of the entire sample. Table 7 considers the smallest banks in the sample with Average of Total Assets contained in the range 0,86 billion – 27,88 billion.

A positive signal comes from the Within R-squared that increases from the 9-10% registered in Table 6 to 20-22%. Anyway, despite of this positive signal, no one of the estimated beta coefficient appears to be significant, neither the one of EuroStoxxBanks variable. Opposite to expectations, NIM appears to have a strong, negative effect on Market-to-Book ratio. Despite of results obtained in the previous table, Net Loans to Total Assets ratio has a positive relation with Market to Book ratio: considering the smallest banks of this

analysis, the ones that maintain a more traditional business activity reaches higher level of market valuation. The same is valid for Loan Loss Reserve to Gross Loans. The sign of Cost-to-income ratio beta coefficients follow expectations only in column "C", before the introduction of EuroStoxxBanks.

Table 7: Fixed effects model using robust (HAC) standard errors.
Small banks of full sample, excluding T1R. Dependent variable: MTB

	A	B	C	D	E
Constant	1,129	0,311	-0,144	-0,041	0,180
	(3,473)	(4,408)	(4,78148)	(5,678)	(5,396)
ROE	83,134	83,674	84,916	84,725	85,822
	(63,674)	(63,429)	(66,4619)	(68,628)	(69,809)
NIM	-218,990	-220,741	-224,682	-225,728	-224,334
	(189,996)	(186,667)	(198,424)	(191,432)	(190,628)
NLTA		1,143	1,445	1,446	1,289
		(2,456)	(2,680)	(2,67569)	(2,575)
LLRGL			5,964	6,067	5,915
			(16,200)	(15,0925)	(14,873)
CIR				-0,094	-0,108
				(1,661)	(1,657)
ESTOXXB					-0,002
					(0,004)
LSDV R-squared	0,653	0,653	0,653	0,653	0,652
Within R-squared	0,203	0,204	0,204	0,204	0,204

N. of observation: 234 with 26 cross-sectional units. Time series length: 9 years. S. Deviation of dependent variable 10,29. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

Table 8 considers the second sub-sample composed of banks with an Average of Total Assets that goes from 27,88 billion to 1891 billions. This table is particularly different from the previous ones. The Within R-squared increases from 14% to 23% after the introduction of EuroSTOXXBanks variable; then, ROE has on average a positive and statistically significant effect on Market-to-Book Value. Its p-value is statistically significant at 1% level in all the models that do not include the controlling variable EuroSTOXXbanks. Unfortunately, after its introduction the estimated beta-coefficient becomes statistically insignificant. On the contrary, EuroSTOXXbanks coefficient is statistically significant at 1% level with a weak but positive impact on Market-to-book ratio. The change could be due to some moderate form of correlation between ROE and EuroSTOXXbank ($\rho_{xy} = 0{,}63$).

Finally, also the signs of other variables appear to be compliant with our expectations. Particularly, Net Interest Margin has a strong and positive (even if not significant) relation with the Market-to-book ratio, and the Cost-to-Income ratio enters in the regression with a

negative coefficient meaning that inefficiency has a negative impact on banks Market-to-Book ratio. Both Net Loans to Total Assets and Loans Loss Reserve to Gross Loans reverse their signs after the introduction of the controlling variable.

Despite the fact that a lot of variables do not appear to be statistically significant, variances in the banks of this sub-sample seems to be lower than those of previous one.

Table 8: **Fixed effects model using Robust (HAC) standard errors.**
Big banks of full sample, excluding T1R. Dependent variable: MTB

	A	B	C	D	E
Constant	-0,271	-0,029	0,100	0,163	-1,548
	(1,302)	(1,168)	(1,242)	(1,343)	(1,601)
ROE	10,825	10,865	10,676	10,551	1,626
	(2,750)***	(3,777)***	(2,829)***	(2,955)***	(2,071)
NIM	72,511	74,712	71,439	70,034	78,510
	(64,2433)	(66,146)	(53,984)	(53,453)	(54,237)
NLTA		-0,046	-0,496	-0,484	0,306
		(0,863)	(1,053)	(1,046)	(0,934)
LLRGL			-1,125	-0,688	2,703
			(12,874)	(11,971)	(11,803)
CIR				-0,057	-0,061
				(0,168)	(0,139)
ESTOXXB					0,018
					(0,005)***
LSDV R-squared	0,743	0,743	0,743	0,743	0,770
Within R-squared	0,144	0,145	0,145	0,145	0,226

N. of observation: 234 with 26 cross-sectional units. Time series length: 9 years. S. Deviation of dependent variable 3,28. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

Next tables include as explanatory variable the Tier 1 Ratio (introduced in column "E") in order to test its effect on the Market to Book Ratio.

Table 9 considers all the thirty-seven banks for which Tier 1 data were available in the years of the analysis. First of all, the Within R-squared, even if low, slightly increases slightly with the introduction of the explanatory variables. Unfortunately, even in these models no one of the explanatory variable seems to be statistically significant.

Regarding the signs of beta coefficients, Net Interest Margin appears with a negative sign only in column "A", in the model that includes as explanatory variables only profitability ratios. Adding the Net Loans to Total Assets variable, adjusts the coefficients of NIM that remain positive thereafter. Net Loans to Total Assets ratio appears always to decrease the Market-to-Book ratio, suggesting that the market rewards a more diversified bank. As in the previous sample, Loan Loss Reserve to Gross Loans coefficients has a negative sign meaning

that an increase in these reserves is interpreted as a decrease in the quality of loans portfolio. Conversely, Cost-to-income ratio coefficients appear with a positive sign, that is weird considering that it means that less efficiency has a positive impact on bank's market-to-book value. In accordance with expectations, Tier one ratio has a positive impact on Market-to-book value; this is true even in the last column "F" that considers also the controlling variable EuroSTOXXBanks.

Table 9: Fixed Effects model using robust (HAC) standard errors.
Narrow sample, including T1R. Dependent variable: MTB

	A	B	C	D	E	F
Constant	0,462	7,398	9,157	8,713	7,516	6,137
	(1,345)	(6,485)	(7,631)	(7,143)	(6,222)	(7,283)
ROE	35,950	35,322	33,712	34,580	36,900	33,507
	(25,493)	(24,853)	(23,615)	(24,699)	(26,666)	(29,638)
NIM	-19,159	21,190	12,719	23,632	13,161	10,212
	(76,776)	(12,4149	(61,692)	(59,2059)	(60,094)	(57,072)
NLTA		-12,500	-14,241	-14,391	-15,093	-13,880
		(12,414)	(13,852)	(14,057)	(14,490)	(15,400)
LLRGL			-9,245	-11,360	-17,517	-17,156
			(11,302)	(12,165)	(16,677)	(16,895)
CIR				0,384	0,448	0,461
				(0,55259)	(0,585)	(0,569)
T1R					0,198	0,223
					(0,194)	(0,172)
ESTOXXB						0,007
						(0,008)
LSDV R-squared	0,615	0,619	0,620	0,620	0,622	0,623
Within R-squared	0,107	0,117	0,118	0,119	0,123	0,124

N. of observation: 333 with 37 cross-sectional units. Time series length: 9 years. S. Deviation of dependent variable 8,97. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

As in the previous analyses, the insignificance of the estimated coefficients could be associated to either: high variability in data or heteroskedasticity problems that remain even using robust standard errors. To decrease the variability of data, the restricted sample has been split in two different halves considering the average of bank's total assets in the nine years of analysis. Results are displayed in tables 10 and 11.

Table 10 shows results obtained for the sub-sample that considers banks with average total assets between 0,63 and 63,35 billion of euro. Even with this sample breakdown the significance of the model does not improve. Within R-squared reaches only the 16% in the last column of the table, that includes all the explanatory variables. Estimated beta

coefficients are not statistically significant except for the model in column C that introduces the variable Loan Loss Reserve to Gross Loans, which enters the regression with an estimated beta coefficients negative and statically significant at 10% level. However, this significance is not maintained after the introduction of other variables such as: Cost-to-Income ratio, Tier 1 ratio and EuroStoxxBanks. With reference to the signs of beta coefficients, Net Interest Margin has a negative estimate. It seems to has a very strong and negative impact on market to book value that is a misrepresentation of real data. On the contrary, even if statistically insignificance, ROE has a strong and positive effect on Market to Book ratio. Moreover, accordingly with previous findings, Net Loans to Total Assets has a negative sign, as well as Loan Loss Reserve to Gross Loans. The same problem of Net Interest Margin is accounted for Cost-to-Income ratio sign. A decrease in efficiency seems to positively affects Market-to-Book. Finally the sign of Tier 1 Ratio has a positive – even if weak – relation with the value measure.

Table 10 Fixed effects model using Robust (HAC) standard errors.
Small banks of narrow sample, including T1R. Dependent variable: MTB

	A	B	C	D	E	F
Constant	1,669	6,214	9,290	9,113	8,188	6,134
	(2,264)	(7,211)	(9,013)	(7,729)	(7,749)	(7,783)
ROE	62,384	60,446	58,037	58,327	59,554	56,352
	(53,334)	(51,510)	(49,585)	(51,092)	(52,885)	(52,714)
NIM	-119,840	-109,464	-115,298	-112,000	-111,728	-124,899
	(176,373)	(176,988)	(157,446)	(155,991)	(160,857)	(152,025)
NLTA		-6,862	-9,819	-9,862	-10,470	-8,596
		(11,035)	(13,431)	(13,821)	(13,991)	(16,241)
LLRGL			-16,382	-16,892	-20,026	-19,405
			(9,374)*	(13,870)	(16,875)	(16,241)
CIR				0,158	0,431	0,604
				(1,565)	(1,685)	(1,750)
T1R					0,120	0,147
					(0,218)	(0,205)
ESTOXXB						0,009
						(0,011)
LSDV R-squared	0,631	0,632	0,634	0,633	0,634	0,635
Within R-squared	0,152	0,154	0,158	0,158	0,159	0,159

N. of observation: 171 with 19 cross-sectional units. Time series length: 9 years. S. Deviation of dependent variable 12,14. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration.

Banks with average total assets between 63,35 billion and 1845 billion compose the subsample which regressions results are presented in Table 11. First of all, Within R-squared

increases from 17% to 30% in the last model that includes EuroStoxxBanks variable. Moreover, ROE estimated beta coefficients appear to have a moderate positive effect on Market-to-book value with a statistical significance at 1% level in all models that exclude the controlling variable. Tier one ratio appears to have a positive, significant effect on Market to Book ratio even if it has only a weak correlation with the measure; nevertheless it is significant at 5% level. Additionally, also EurostoxxBanks has a positive effect and although it is only a weak relation, it is statistically significant at 1% level. Net Interest Margin estimated beta coefficient, even if not statistically significant, has a positive effect on Market to book value, even after the introduction of the controlling variable. Net loans to total assets and Loan Loss reserve have both negative beta-coefficients while Cost-to-income ratio reflects expectations only in the last model.

Table 11: Fixed effects model using Robust (HAC) standard errors.
Big banks of narrow sample, including T1R. Dependent variable: MTB

	A	B	C	D	E	F
Constant	0,361 (1,519)	2,938 (2,749)	3,157 (5,061)	3,142 (5,030)	2,912 (4,579)	-1,088 (3,806)
ROE	13,934 (5,093)***	14,889 (5,812)**	14,619 (4,094)***	14,694 (4,334)***	15,571 (4,457)***	3,097 (2,336)
NIM	27,033 (73,2713)	62,281 (109,567)	59,743 (79,575)	61,010 (83,581)	54,474 (75,886)	69,318 (79,857)
NLTA		-5,888 (8,009)	-6,077 (10,037)	-6,134 (10,168)	-6,631 (10,634)	-3,701 (9,667)
LLRGL			-1,301 (23,584)	-1,646 (23,796)	-5,588 (27,734)	-7,912 (27,796)
CIR				0,035 (0,146)	0,055 (0,163)	0,055 (0,1511)
T1R					0,074 (0,112)	0,181 (0,122)
ESTOXXB						0,023 (0,006)***
LSDV R-squared	0,657	0,662	0,662	0,662	0,664	0,696
Within R-squared	0,170	0,182	0,183	0,183	0,186	0,264

N. of observations: 162 with 18 cross-sectional units. Time series length: 9 years. S. Deviation of dependent variable 3,01. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

3.2.1. Heteroskedasticity controls

Heteroskedasticity problems have been taken into account in the previous Fixed Effects regressions by the use of Arellano (1978) robust standard errors. Unfortunately, these robust errors correct only partially the absence of homoscedasticity assumption.

Results reported in the previous tables – with only few exceptions – do not appear to be statistically significant. This might be due to: (i) an excess of data variability; (ii) the sample size that in the best scenario is composed of only 52 banks; (iii) some heteroskedasticity problems that still remain even with the use of robust standard errors.

If the first two hypotheses could not be treated because they are intrinsic characteristics of the sample, regarding the last option some corrections can be adopted.

First of all, in order to verify that heteroskedasticity affects the model, it has been performed the White's test for the null hypothesis that the errors are homoscedastic. Through this test all the forms of heteroskestasticity that invalidate OLS standard errors and test statistics are considered that is, the likelihoods of correlations between the squared errors and: (i) the independent variables; (ii) the squared independent variables; (iii) all the cross product of the independent variables (Wooldridge, 2014). This test is only one of the alternatives through which it is possible to verify the presence of homoscedasticity. Obtaining a low p-value means that the null hypothesis is rejected, in favour of the alternative for which the model is affected by heteroskedasticity. This is the case of all model described in the previous sections.

Before the introduction of robust standard errors, heteroskedasticity problems were treated using Weighted Least Squares (Wooldridge, 2014). As Wooldridge (2014) explains, the aim of this method is to estimate a function of the explanatory variables $h(\boldsymbol{x})_i$ that determines heteroskedasticity, i.e. $Var(u|\boldsymbol{x}) = \sigma^2 h(\boldsymbol{x})_i$. Moreover, since variance must be positive, the function $h(\boldsymbol{x})_i > 0$. Once having determined this function, it could be used to transform the regression function with heteroskedastic errors in one with homoscedastic ones. The logic is that in order to obtain $Var(u|\boldsymbol{x}) = \sigma^2$ it is sufficient to divide the regression equation by $\sqrt{h}$. In this way, as clarified by the author, $Var\left(\frac{u}{\sqrt{h}}\middle|\boldsymbol{x}\right) = \sigma^2$ with a zero mean. The beta coefficients obtained are the *generalized least squares estimators* and, due to the fact that they correct heteroskedasticity problems, they are also called *weighted least squares estimator*. Indeed, they minimize the weighted sum of squared residuals using as weight the function $\frac{1}{\sqrt{h}}$ giving less weight to observations with higher error variance. Moreover, even if WLS estimates and standard errors are different from OLS ones, their interpretations remain the same (Wooldridge, 2014).

When the exact function $h(\boldsymbol{x})_i$, that determines the heteroskedastic errors, is unknown, author suggests to model a function $\hat{h}_i$ that is an estimate of the unknown one and that is called Feasible GLS estimator.

Gretl software allows performing both a manual WLS regression and an automatic WLS regression. In the first it requires to define which variable will be used as weight, while, in the second Gretl itself estimates weights based on per units error variances. The latter method is used in the regressions whose results are shown in the next tables. Results suggest an overall improvement reached trough the use of Weighted Least Squares. As it has been done in the previous Fixed-Effects models, independent variables are added in succession so as to verify how much they are able to explain variation in the dependent variable.

Table 12 shows results of the regressions performed using the Full sample of banks that do not consider Tier 1 ratio variable. Adjusted R-squared (computed on average data) goes from 0,134, in the model that considers only profitability ratios, to 0,214 in the last column where all the variables are considered. Particularly, it must be considered that the measure has reached its maximum in column D, before the introduction of EuroStoxxBanks variable, which contrary to the Fixed-Effect model findings seems to deteriorate the ability of the model to describe variations in the dependent variable.

Profitability ratios appear to have positive relations with Market-to-Book ratio, that are statistically significant at 1% level for ROE and at 5% level for NIM. This last increases its significance after the introduction of Net Loans to Total Assets in column B, which leads also to an increase in the Adjusted R-squared that reaches 0,264. Net Loans to Total Assets strengthen the relation between Market-to-Book ratio and Net Interest Margin and enters the regression with a negative estimated beta-coefficient that is statistically significant at 1% level. Although an increase in the percentage of Net Loans in respect to bank's total assets produces an increase in interest margin that is highly positively correlated with the value measure, it induces also a slightly decrease in the market-to-book ratio due to the fact that a more diversified bank is valued more by the market. Moreover, this relation is maintained in all the other columns.

Loan Loss Reserve to Gross Loans enters the model with a positive, not very strong, relation with the dependent variable. Moreover, despite the fact that this relation is statistically significant at 5% level, it partially deteriorates the ability of the model to explain Market-to-book ratio with the adjusted R-Squared that goes back to 0,224. Regarding the relation between this variable and the dependent one, it should be noted that even if the market rewards banks with high Net Interest Margin and a business activity that is well diversified among traditional and non traditional services, it also seems that an increase in Loan Loss Reserve is interpreted as an index of greater management's prudence rather than as a deterioration in Loans portfolio.

The introduction of Cost-to-Income ratio leads to two consequences: (i) it increases the Adjusted R-squared, which reaches its maximum level; and (ii) it causes the Loan Loss Reserve to Gross Loans to become statistically insignificant. Moreover, this variable registers a weak negative relation with the Market-to-Book ratio, statistically significant at 1% level. One can probably assert that the positive relation considers changes in Cost-to-income ratio that are in any case very contained around the mean.

EuroStoxxBank is included in the last column. Although it appears to be statistically significant at 5% level, its coefficient is almost zero and causes the fall of Adjusted R-squared, which goes back to 0,214. Moreover, after this inclusion Net Interest Margin estimated beta coefficient becomes statistically insignificant.

Table 12: Weighted Least Squares. Full Sample, excluding T1R.
Dependent variable: MTB, weights based on per-unit error variances

	A	B	C	D	E
Constant	0,154	1,651	0,960	0,270	0,081
	(0,103)	(0,210)***	(0,228)***	-0,273	-0,311
ROE	6,031	4,447	6,701	7,953	7,912
	(0,722)***	(0,775)***	(0,948)***	(0,948)***	(1,147)***
NIM	12,060	31,634	15,141	13,642	12,021
	(5,714)**	(7,097)***	(6,983)**	(6,707)**	(8,111)
NLTA		-2,801	-2,087	-1,716	-1,554
		(0,250)***	(0,251)***	(0,257)***	(0,303)***
LLRGL			6,002	2,981	6,022
			(2,423)**	(2,509)	(2,846)**
CIR				0,685	0,561
				(0,150)***	(0,164)***
ESTOXXB					0,002
					(0,001)**
Statistics based on weighted data:					
R-squared	0,138	0,269	0,230	0,270	0,225
Adjusted R-squared	0,134	0,264	0,224	0,260	0,214

N. of observations: 468 with 52 cross-sectional units. Time series length: 9 years. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

Table 13 considers the subsample composed of the smallest banks, whose averages of total assets reach 27,88 billion of euro. Particularly, it should be considered that for the banks in this subsample, the model that better approximates Market-to-Book ratio is the first one, in column A. Its Adjusted R-squared is 0,176 and it decreases significantly just after the introduction of Net Loans to Total Asset variable. Profitability ratios have both positive and statistically significant estimated beta coefficients: ROE at 5% level and Net Interest Margin at 1% level. This last contributes the most to increase Market-to-Book ratio and contrary to

what happens for ROE it remains significant even in column B that includes Net Loans to Total Assets. The latter enters the analysis with a negative estimated beta coefficient, which is also statistically significant at 1% level. The negative relation seems to infer that the smallest banks of the analysis are valued more by the market if their business activities are more oriented to diversification. The model is further deteriorated by the inclusion of Loan Loss Reserve to Gross Loan that appears to be statistically insignificant[72]. In any case, following its inclusion, ROE becomes statistically significant at 1% level, maintaining this level in all other columns. Adjusted R-squared starts to rise again in column D, where Cost-to-Income ratio is added. As in the previous table, it enters the analysis with a positive, weak relation with Market to Book ratio and it is always statistically significant at 10% level. It also causes Net Loans to Total Asset ratio to become significant at 5% level rather than 1%. This ratio decreases furthermore its significance after the inclusion of EuroStoxxBank that, although, it appears to be statistically insignificant, helps the restoration of Adjusted R-squared.

Table 13: Weighted Least Squares. Small banks of full sample, excluding T1R.
Dependent variable: MTB, weights based on per-unit error variances

	A	B	C	D	E
Constant	-0,716 (0,124)***	1,083 (0,432)**	0,876 (0,491)*	0,161 (0,593)	-0,315 (0,657)
ROE	2,498 (1,140)**	0,808 (1,048)	4,500 (1,575)***	6,046 (1,832)***	7,678 (2,065)***
NIM	44,771 (6,886)***	22,727 (7,255)***	2,175 (7,451)	5,548 (8,249)	4,007 (8,590)
NLTA		-1,785 (0,504)***	-1,613 (0,512)***	-1,340 (0,544)**	-1,086 (0,576)*
LLRGL			5,728 (3,525)	3,063 (3,754)	2,906 (3,829)
CIR				0,649 (0,362)*	0,880 (0,393)**
ESTOXXB					0,002 (0,001)
Statistics based on weighted data:					
R-squared	0,183	0,111	0,091	0,100	0,110
Adjusted R-squared	0,176	0,099	0,075	0,080	0,083

N. of observations: 234 with 26 cross-sectional units. Time series length: 9 years. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

[72] *Nonetheless, the variable has been maintained in the model because its presence contributes to the increase in Adjusted R-squared in the following columns. The model that includes all the variables except of LLRGL obtain an adjusted R-squared near 0,07.*

Differently from the results obtained in the previous subsample, Table 14 shows that, considering the biggest of the fifty-two banks, the model that includes all the explanatory variables, is also the one with the highest Adjusted-R squared, which is equal to 0,28.

Particularly, it should be noted that Net Interest Margin is never statistically significant and that ROE is statistically significant at 1% level in all cases except when EuroStoxxBank is added to the other explanatory variables. Indeed, in column E, ROE is statistically insignificant and its estimated beta coefficient becomes negative. Of course the fact that it is not significant means that it cannot be rejected the hypothesis for which the true coefficient is zero.

Accordingly, also Net Loans to Total Assets is never significant while Loan Loss Reserve to Gross Loans enters the regression with a 5% level of significance. Its coefficient implies that an increase in Loan Loss Reserves to gross loans for the biggest banks is interpreted as an index of greater prudence against Loans losses. The inclusion of Cost-to-Income ratio, whose beta estimate is positive and statistically significant at 5% level, cause the estimated beta coefficient of LLRGL to become statistically insignificant. Nonetheless, it becomes again significant, at 1% level, after the introduction of EuroStoxxBank that is the only other variable statistically significant.

Table 14: Weighted Least Squares. Big banks of full sample, excluding T1R.
Dependent variable: MTB, weights based on per-unit error variances

	A	B	C	D	E
Const	0,525	0,657	0,652	0,333	-0,576
	(0,141)***	(0,186)***	(0,178)***	(0,219)	(0,268)**
ROE	4,492	4,355	5,187	5,682	-1,300
	(0,897)***	(0,924)***	(0,867)***	(0,914)***	(1,259)
NIM	5,416	7,462	1,477	7,169	14,545
	(7,867)	(9,392)	(9,731)	(9,634)	(9,028)
NLTA		-0,277	-0,316	-0,333	0,123
		(0,307)	(0,294)	(0,284)	(0,350)
LLRGL			5,131	1,743	9,258
			(2,256)**	(2,553)	(2,93)***
CIR				0,298	0,006
				(0,131)**	(0,13)
ESTOXXB					0,011
					(0,002)***
Statistics based on weighted data:					
R-squared	0,101	0,092	0,142	0,150	0,300
Adjusted R-squared	0,093	0,079	0,126	0,132	0,280

N. of observations: 234 with 26 cross-sectional units. Time series length: 9 years. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

The next three tables present results of regressions, which include among explanatory variables also the Tier 1 ratio. As it has been argued in previous pages, by considering this variable, the sample decrease from fifty-two banks to thirty-seven as this data are not available for fifteen banks.

Table 15 considers all these thirty-seven banks. It should be noted that the model does not present a high ability to explain Market-to-book ratios as it could be observed by the Adjusted r-squared that is maximum in Column F. Although even in this model independent variables have been added subsequently, in order to improve the measure of fit some of them have also been excluded.

Considering the first column, we can see that the two profitability ratios enter the regression with positive estimated beta coefficients that are also statistically significant at 1% level. Unfortunately, Net Interest Margin, that has the greater effect on Market to Book ratio, becomes statistically insignificant[73] in the column B, where it is included Net Loans to Total Assets. This last enter the analysis with a negative coefficient, which denotes a negative relation with Market-to-Book ratio that is statistically significant at 5% level. It confirms that a more diversified banking business is well rewarded by the market. Column D has two changes with respect to the previous one: (i) Net Interest Margin ratio has been excluded from the analysis; and (ii) Loan Loss Reserve to Gross Loans has been included. In spite of the statistically insignificance of the estimate of this variable, with these changes it has been possible to increase the Adjusted r-squared from 0,065 to 0,089. It remains almost the same in column D where it is added also the Cost-to-Income ratio, while, the inclusion of Tier 1 Ratio decreased the ability of the model to explain the dependent variable. Nevertheless, Tier 1 Ratio enters the regression with an estimated beta coefficient that is near zero, but still negative, meaning that an increase in capital requirements produce a slightly decrease in Market-to-book ratio. The relation is statistically significant at 1% level. Moreover, this inclusion increases the statistically significance of Net Loans to total Assets and Loan Loss Reserve to Gross loans. It does not have any effect on the significance of Cost-to-income ratio that is therefore excluded in the last column where it is also included EuroStoxxBank variable, in order to consider the possible effects linked to the market. By including this last variable, there are some changes in the significance of the estimated beta coefficients: (i) ROE becomes statistically insignificant, (ii) Loan Loss reserve to gross Loans decreases its significance to 10% level; and (iii) Tier 1 Ratio reduces its one to 5%. Never the less, the

[73] *After some tests, the variable NIM has then been excluded starting from the model in column D.*

market variable has a positive and statistically significant beta coefficient at 1% level, and it increases the explanatory power of the entire model to 0,141.

Table 15: Weighted Least Squares. Narrow sample, including T1R.
Dependent variable: MTB, weights based on per-unit error variances

	A	B	C	D	E	F
Const	0,104 (0,139)	1,221 (0,331)***	0,931 (0,372)**	0,748 (0,425)*	2,516 (0,601)***	2,119 (0,668)***
ROE	6,340 (0,968)***	4,819 (1,113)***	7,161 (1,344)***	7,452 (1,389)***	5,637 (1,481)***	2,382 (1,864)
NIM	31,393 (8,210)***	17,268 (12,85)				
NLTA		-1,377 (0,579)**	-1,039 (0,504)**	-1,068 (0,508)**	-2,073 (0,581)***	-2,076 (0,598)***
LLRGL			4,325 (3,376)	4,009 (3,571)	7,638 (3,848)**	6,444 (3,781)*
CIR				0,240 (0,225)	0,121 (0,225)	
T1R					-0,105 (0,031)***	-0,093 (0,036)**
ESTOXXB						0,008 (0,002)***
Statistics based on weighted data:						
R-squared	0,143	0,074	0,099	0,099	0,096	0,154
Adjusted R-squared	0,137	0,065	0,089	0,088	0,079	0,141

N. of observations: 333 with 37 cross-sectional units. Time series length: 9 years. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

From the analysis of the next two tables, it is possible to clarify that, the reason of the scarce ability of the model to explain Market to Book ratio has to be attributed to an high variability in data especially for which regards the smallest banks of the sample, whose subsample is considered in the findings shown in table 16.

Even with all the adjustment considered (i.e. excluding the variables with the highest p-value) the model is not able to explain data with an Adjusted R-squared that move from 2% to 6,5%, after the introduction of EuroStoxxBank.

Except of the intercept, the only variable that seems to be statistically significant is Net Loans to Total Assets (in detail, it becomes significant in column C, after the inclusion of Loan Loss Reserve to Gross Loans). This variable confirms the negative relation existing between traditional banking activities and the measure of value given by the Market-to-Book ratio. All the possible assertion on the other variables appear to be superfluous given the fact that their estimate are not significant and that plausibly their true value could be zero (it is not possible to reject the null hypothesis).

Table 16: Weighted Least Squares. Small banks of narrow sample, including T1R.
Dependent variable: MTB, weights based on per-unit error variances

	A	B	C	D	E	F
Const	0,130	4,890	3,300	3,723	4,975	6,692
	(0,351)	(1,594)***	(1,221)***	(1,305)***	(1,660)***	(2,205)***
ROE	1,866	-0,365				
	(1,812)	(2,820)				
NIM	25,657	20,859	30,253	27,527	38,067	48,027
	(15,941)	(25,187)	(23,593)	(24,722)	(27,295)	(32,381)
NLTA		-6,417	-4,820	-5,315	-6,665	-9,173
		(2,157)	(1,777)***	(1,824)***	(2,001)***	(2,484)***
LLRGL			2,963	1,004	1,402	
			(4,712)	(5,763)	(6,734)	
CIR				0,097	0,154	0,535
				(0,619)	(0,693)	(0,632)
T1R					-0,063	-0,102
					(0,063)	(0,073)
ESTOXXB						0,002
						(0,005)
Statistics based on weighted data:						
R-squared	0,019	0,053	0,050	0,050	0,067	0,090
Adj. R-squared	0,007	0,036	0,028	0,028	0,039	0,065

N. of observations: 171 with 19 cross-sectional units. Time series length: 9 years. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

The opposite holds for big banks: R-squared and Adjusted R-squared go from 14,6% to 31,8% and from 13,6% to 30% although they reach their maximum level in Column C, before of the introduction of Cost-to-Income ratio, Tier 1 Ratio and EuroStoxxBank. Nonetheless, a lot of estimated beta coefficients appear to be statistically significant even in the last three columns. Starting from column A, which considers only profitability ratio, it is possible to see that only ROE has a positive, statistically significant relation with Market-to-Book Ratio. Although it enters the regression with a positive, and statistically insignificant relation with Market-to-Book ratio, beta coefficient of Net Interest Margin becomes negative in the second column that considers also the effect of Net Loans to Total Assets. The presence of some forms of collinearity between these two variables could be the reason of this change. Moreover, these estimated beta coefficients are statistically significant until it has been included also the Tier 1 ratio, in column E. Net Loans to Total Assets, differently from previous analyses, enters the regression with a positive estimated beta coefficient, which is also statistically significant at 1% level: while for small banks diversification has a positive effect on market-to-book value, for big banks there is evidence of a positive and statistically significant correlation between Market-to-Book and a more traditional business. Even this significance remains until Tier 1 ratio is included.

Loan Loss Reserve to Gross Loans introduction increases a lot the ability of the model to fit data. The variable has a positive and statistically significant relation with Market-to-Book ratio and its significance rises from 5% level to 1% level after the inclusion of Tier 1 ratio. On the contrary, Cost-to-Income ratio does not improve the model and it is statistically insignificant with p-value that similarly to the one of Net Interest Margin is around 88% so that both variables have then been excluded in column F. Moreover, this column excludes also Net Loans to total Assets that becomes statistically insignificant in column E. Here, the intercept, ROE, Loan Loss Reserve to Gross Loans and Tier 1 Ratio are all statistically significant at 1% level. Particularly, Tier 1 Ratio appears again with a negative coefficient, stating for the impact that an increase in banks capital requirements has on Market-to-Book ratio. The last column considers only variables that have appeared to be significant in the previous columns, moreover, it adds EuroStoxxbank index to consider any possible effect linked to the market. These changes entails the statistically insignificance of ROE and the decrease in Tier 1 ratio significance. Loan Loss Reserve to Gross Loans is still positively correlated with Market-to-book value and its beta-coefficient estimate remains statistically significant at 1% level.

Table 17: Weighted Least Squares. Big banks of narrow sample.
Dependent variable: MTB, weights based on per-unit error variances

	A	B	C	D	E	F
Const	0,617	0,108	0,021	-0,079	1,306	0,176
	(0,174)***	(0,125)	(0,144)	(0,175)	(0,472)***	(0,463)
ROE	5,766	5,700	7,494	7,662	4,871	0,158
	(1,120)***	(0,866)***	(0,681)***	(0,738)***	(1,297)***	(1,429)
NIM	4,062	-24,345	-43,820	-40,053	-4,679	
	(10,029)	(11,491)**	(12,185)***	(13,176)***	(11,466)	
NLTA		1,933	2,326	2,179	0,111	
		(0,396)***	(0,363)***	(0,398)***	(0,540)	
LLRGL			5,584	5,510	13,208	12,362
			(2,423)**	(2,577)**	(3,745)***	(3,191)***
CIR				0,115	0,044	
				(0,118)	(0,159)	
T1R					-0,114	-0,065
					(0,033)***	(0,035)*
ESTOXXB						0,013
						(0,002)***
Statistics based on weighted data:						
R-squared	0,146	0,310	0,483	0,467	0,208	0,318
Adj. R-squared	0,136	0,297	0,469	0,449	0,177	0,300

N. of observations: 162 with 18 cross-sectional units. Time series length: 9 years. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

Chapter IV

Banks' Returns: Analysis for the Euro Area

As it has been argued in the second chapter, Market-to-book ratio analysis is only one of the possibilities through which it could be assessed the value relevance of banks' financial statements. The other approach, recognized by Barth, Beaver and Landsman in 2001, aims to determine what is reflected on changes in share prices over a specific period of time. This latter will be analysed in the present chapter, so as to provide a comprehensive disclosure of the argument. Cooper, Jackson III and Patterson (2003) and Romagnoli (2007)[74] executed this kind of analysis, regressing banks' stock returns with some financial and accounting ratio.

In line with the work proposed in the third chapter, this empirical research focuses on the Euro Area banking system but, contrary to the previous analysis, the period considered goes from 2007 to 2014. Financial ratios account again for profitability, efficiency, riskiness, business activity and capital adequacy.

The first paragraph describes the changes adopted in the sample and its new peculiarities; how financial ratios have been modified and the econometric methods used to develop this last analysis. The second paragraph focuses on Fixed Effects regression findings.

4.1. Data and methods

Although even this analysis concentrates on publicly listed commercial and cooperatives banks registered in the Euro Area, due to the different approach followed in the research, both the sample of banks and the timeframe have registered some small changes.

4.1.1. Changes in the Sample

The fifty-two banks that compose the balanced sample described in the previous chapter constitute the starting point to develop this additional analysis. That sample was composed of commercial and cooperatives banks for which have been exported: (i) financial statements, from Bureau-Van Dijk – Bankscope; and (ii) market information (prices and number of shares), from Thomson Reuters – Datastream. Through a complex selection process the final

[74] *Chapter II, paragraph 2.3, page 54.*

sample was composed of all the banks for which financial and market variables were available from 2006 to 2014[75].

The present work requires the availability, for each bank and for every year, of another market variable: annual stock returns. This last has been exported from Thomson Reuters – Eikon that is a trading and investing tool elaborated by the same company of Datastream. It gives access to both real-time data and historical information, from more than 400 exchanges and OTC-traded markets. The first change in the sample arises from the inclusion of this variable: Thomson Reuters – Eikon does not give access to annual stock returns of one Austrian bank[76] that, for this reason, has been excluded from the sample.

Even the timeframe is subject to some changes: as it will be clarified in the next subparagraph, due to the fact that the dependent variable is an "annual change", also the explanatory variables must be considered as annual changes. This means that, in order to be part of the sample, each bank must have data available from one year before the first considered in the time horizon. As it has been largely discussed in the previous chapter, 2006 was the first year for which all data were available for the fifty-two banks so, this new analysis will cover the period between 2007 and 2014.

4.1.2. Changes in Financial Ratios

The financial statements analysis conducted in the previous chapter has been repeated in order to understand whether bank's characteristics have some kind of impact on the change in shares prices. If the first analysis could be connected with the ones developed by Ming-Li and Liang (2005), Jordan et al. (2011) and Macit and Topaloglu (2012) that study the relation between a bank's market value measures and financial ratios; this last could be linked to the researches of Cooper, Jackson III and Patterson (2003) and Romagnoli (2007) that aim to explain the correlation existing between bank's stock returns and financial ratios.

Due to the fact that this research does not concern anymore the correlation between a measure of value such as the Market-to-Book ratio and financial and accounting information, this last have been adjusted in order to be comparable with the new dependent variable. Particularly, financial ratios concerning banks' profitability, efficiency, riskiness, business activity and capital adequacy will be expressed in terms of annual percentage changes.

---

[75] *Chapter III, paragraph 3.1.1, page 60.*

[76] *The excluded bank is Raiffeisenlandesbank Oberösterreich AG. Although Datastream provided share prices until 2014 (the company has then been delisted) Eikon does not provide its stock returns.*

Considering a financial ratio R, the annual percentage changes are calculated by dividing the value of the ratio at time t with the value of the ratio one period before, minus one (equation (4)):

$$\Delta R_t = \frac{R_t}{R_{t-1}} - 1 \quad (4)$$

This equation shows why the time horizon has been reduced: the first year of analysis cannot be 2006 due to the fact that in 2005 financial information are not available for some of the banks included in the original sample. In order to maintain them, the analysis will start considering the changes in financial ratios registered in 2007.

The main difference between this analysis and the Market-to-Book one is constituted by the substitution of the dependent variable, which will be described in the next section.

Stock returns

Stock returns constitute one of the crucial arguments in financial markets researches. Starting with Markowitz's portfolio selection theorem elaborated during '50s, many other authors develop theories, known as "asset pricing models" in which expected returns of a portfolio have been related with some measures of risks which consider a systemic component due to the market risk and an idiosyncratic component, specific of the single asset/firm. Anyway, the present analysis does not intend to expand existing literature: the aim of this work is not to develop models through which estimate stock returns for investing purposes but rather to understand whether the variations in banks' stock returns are linked, in some ways, with variations in their financials ratios.

Stock returns can arise from two sources: profit of trading and dividends given by the company. This last comes from management's decisions[77] to distribute a portion of company's profits to its shareholders. Both these components are included in the definition of stock return index developed by Thomson Reuters – Eikon and that it is therefore used in this analysis. As it is possible to see from the equation (5), the Return Index is influenced by return of the previous period; stock prices and dividends.

$$RI_t = RI_{t-1} \times \frac{P_t + D_t}{P_{t-1}} \quad (5)$$

[77] *Although dividend distribution can be seen as a positive signal linked to the high profitability of the company, managers are always very careful with changes in dividend policies: for example, an increase in dividend yield could be also interpreted as a signal of scarce growth opportunities to exploit.*

Particularly, the return index at time t, RI_t, is calculated by multiplying its value at time t–1, RI_{t-1}, with the ratio of: (i) the stock price at time t, P_t, plus the dividend at time t, D_t; and (ii) the stock price at time t–1, P_{t-1}.

Table 18 shows some summary statistics relative to Stock Return Index. The mean value is negative, as a lot of banks registered a negative return index during the period considered with their prices that had a negative trend. As it has been previously discussed, this finding cannot be considered an unexpected outcome since that between 2007 and 2014, the banking system has been overturned by the burst of the financial crisis with its negative effects also in banks' stock prices.

Table 18: Stock Return summary statistics, using the observations 1:1 - 51:8

	RI
Mean	-0,4748
Median	-0,5138
Minimum	-0,9977
Maximum	0,4542
Standard Deviation	0,3292
S. D. Within	0,2342
S. D. Between	0,2477
5% percentile	-0,9401
95% percentile	0,1348
Missing Observation	0

Source: author's elaboration

4.1.3. Changes in the econometric model

The few changes in the sample that have been described does not alter its structure, which continues to be a panel of data with the same characteristics and advantages of the one used in the previous chapter. Particularly, the dataset is now composed of fifty-one individuals (banks) whose financial ratios are measured for the eight years between 2007 and 2014. Similarly to equation (1), the dataset could be described by:

$$RI_{it} = \alpha + \boldsymbol{\beta R_{it}} + v_{it} \quad (6)$$

Where, RI_t, is the Return Index calculated by the use of equation (5) that constitutes the dependent variable of the regression and that is calculated for every bank *i*, and for every year *t*; α is the intercept term; **β** is a k × 1 vector of parameters on the explanatory variables **R** that is in turn a vector 1 × k of percentage changes in Financial Ratios calculated again for every bank *i* and at any time *t*. Finally v_{it} is the error term.

Contrary to the previous analysis, the variable ESTOXXB, that was included in order to accounts for external influences linked to the market, has not been considered[78]. Indeed, one important adjustment to the models analysed in chapter three and described by equations (2) and (3), is the introduction of $T-1$ time dummies[79], which are equal to 1 for a specific year and 0 for the others. That is, considering the last year of analysis, 2014, which is controlled by the dummy variable *dt_8*: observations that refer to that specific year will have a 1 in dt_8 while, observations that refer to other years will report a 0. By using these time dummies, we allow the intercept to vary across years so as to take into account time-specific fixed effects (i.e. the exacerbating of the financial crisis)[80].

In accordance with the reasoning and the methodologies adopted in the third chapter, also this analysis will be developed in two steps.

First, all the fifty-one banks are considered in a model that, similar to the one expressed by equation (2) does not study the effect of changes in Tier 1 ratio. The new model is defined by the equation (7):

---

[78] *Due to the fact that, this analysis will include a set of time dummies in order to control for any kind of trend, it does not make sense to include either a time trend variable or a variable that does not change across every individual (as EuroStoXXBanks). Indeed time dummies and both these two kind of variable are perfectly collinear (Wooldridge, 2014)*

[79] *The first time dummy has been removed in order to escape the "dummy variable trap": an event where independent variables are highly correlated so that one variable can be predicted from the others. Considering the situation in which one wants to control for two specific factors, let's say A and B. It is sufficient to include a dummy that equals 1 if the factor is A and 0 otherwise. If the model includes another dummy that equals 1 when the factor is B and 0 otherwise, the two dummies will be perfectly correlated. The same is valid when the events to control are N: it will be sufficient to insert* $N-1$ *dummies.*

[80] *In order to test the utility of these variables, regressions have been performed, first of all, for the models that do not include them. Results confirm that the inclusion of time dummies increases the ability of the model to explain the variability of the dependent variable. Moreover, as it will be clarified in the next page, by using these dummies, it is possible to correct some forms of heteroskedasticity that remain even considering robust standard errors. To this purpose, the introduction of time dummies was considered also in the analysis in the third chapter. However, in that case, the variables did not appear to be statistically significant and their inclusion did not correct for the absence of homoscedasticity. These are the reasons why the analysis in the previous chapter does not consider time dummies, preferring a macro variable, which accounts for trend in the market during years.*

$$RI_{it} = \alpha + \beta_1 ROE_{it} + \beta_2 NIM_{it} + \beta_3 NLTA_{it} + \beta_4 LLRGL_{it} + \beta_5 CIR_{it} + \sum_{t=2}^{8} \lambda_t d_t + v_{it} \quad (7)$$

With $i = 1 \dots 51$ and $t = 1 \dots 8$.

Second, as it has been explained in the third chapter, a narrow sample is considered, including only banks for which information about Tier 1 ratio are available. The regression function (8) describes the changes that have been made in equation (3):

$$RI_{it} = \alpha + \beta_1 ROE_{it} + \beta_2 NIM_{it} + \beta_3 NLTA_{it} + \beta_4 LLRGL_{it} + \beta_5 CIR_{it} + \beta_6 T1R_{it} + \sum_{t=2}^{8} \lambda_t d_t + v_{it} \quad (8)$$

With $i = 1 \dots 36$ and $t = 1 \dots 8$.

In both cases, results are shown for the whole samples and for their halves so as to consider the differences in bank's size that have been explained in the third chapter.

A Fixed Effects model is developed to perform the analysis[81] and, even in this case, the Hausman's test supports the choice rejecting the null hypothesis for which the Random Effect model is consistent.

Heteroskedasticity is taken into account by ordering the statistic package Gretl to consider Arellano's robust standard errors. Contrary to the previous analysis, the White's test ascertains that Arellano's robust standard errors combined with time dummies are able to correct heteroskedasticity[82].

4.2. Regression findings

Before showing results obtained from the regressions of equations (7) and (8), it must be clarified that, as in the previous analysis, both models have been implemented by adding one variable at time (except for the seven dummies that are always considered). This choice allows to test the significance of variables by studying their p-value and the enhancement that their inclusion provides to the explanatory power of the model, measured by the within R-squared[83].

---

[81] *Chapter III, subparagraph 3.1.3, page 71.*

[82] *Particularly, the White's test has been performed before and after the introduction of the time dummies: When, in the first case, robust standard errors are not able to control for heteroskedasticity the introduction of those variables resolves the problem.*

[83] *Chapter III, paragraph 3.2, page 75.*

Results of equation (8), which does not consider the effects of Tier 1 Ratio changes, are presented in table 19. The first assertion that it could be made attains the predictive power of the model. The within R-squared, that is the one which considers time-demeaned data, is around the 59% in almost all models described from column A to column D. Particularly, the inclusion of explanatory variables increase, even if very slowly, the measure of fit stating for the improvement that those inclusions cause to the model.

Considering the significance of beta-estimates, the first positive conclusion could be made for the two profitability ratios. Both, changes in ROE and changes in Net interest margin are linked with increases in the variation of stock returns signaling the positive effect that the perception of a profitable bank has on investors' decisions. Although the two beta-coefficients are very low (i.e. a change in ROE or NIM of 20% is correlated with an increase of 0,02% in Stock Returns), both relations are statistically significant at 1% level and maintain this significance also after the inclusion of other explanatory variables. Particularly, changes in Net Interest Margin remain always significant at 1% while changes in ROE decrease their significance after the introduction of Cost-to-Income changes. One possible explanation could be that both operating costs (negatively) and operating incomes (positively) have an influence on Net Profits, so that an increase in Cost-to-Income ratio could be linked with a decrease in ROE. Although the correlation between these two variables shows a very weak, negative relation ($\rho_{xy} = -0{,}20$), it could be the reason why after introducing Cost-to-Income variable the significance of ROE decreases from 1% to 5% level.

For the full sample, Net Loan to Total Assets changes are positively linked with changes in stock returns meaning that a more traditional banking structure, on average, is valued more by the market. Anyway, this positive relation appears to be statistically insignificant. Even Loan Loss Reserve to Gross Loans and Cost-to-Income ratio do not appear to be statistically significant. Anyway, positive changes in the first variable are associated, on average, with positive changes in stock returns, as the market will consider an increase in reserves as a signal of increase in management prudence. On the contrary, and in accordance with expectations, positive variations in Cost-to-Income are associated with negative changes in stock return: an inefficient bank is valued less by the market.

Finally, time dummies account for any kind of external issue linked to a specific year that can be correlated with stock returns. All estimated beta coefficients of these dummies are statistically significant at 1% level, and all register negative relations with stock returns. One of the possible reasons could be the peculiarity of the years considered: the first time dummy, dt_2, considers the second year of analysis for which changes in financial ratios and stock returns are available for the period between 2007 and 2008 that is exactly when the U.S.

banking crisis started to spread itself all over the world. Dt_5 and dt_6 are inherent the years 2011 and 2012 respectively, so that changes in explanatory variables are calculated considering the periods: 2010-2011 and 2011-2012. Negative peaks registered by these two dummies, perhaps, could be correlated with the exacerbating of the euro-area sovereign debt crisis with all its negative consequences[84].

Table 19: Fixed effects model using Robust (HAC) standard errors.
Full sample, excluding T1R. Dependent variable: RI

	A	B	C	D
Constant	-0,0542 (0,028)*	-0,056 (0,028)**	-0,058 (0,027)**	-0,058 (0,027)**
ROE	0,001 (0,001)***	0,001 (0,001)***	0,002 (0,001)***	0,001 (0,001)**
NIM	0,001 (0,0002)***	0,001 (0,0002)***	0,001 (0,0002)***	0,001 (0,0002)***
NLTA		0,057 (0,040)	0,063 (0,039)	0,066 (0,040)
LLRGL			0,017 (0,017)	0,023 (0,019)
CIR				-0,039 (0,024)
dt_2	-0,468 (0,030)***	-0,469 (0,030)***	-0,471 (0,030)***	-0,465 (0,029)***
dt_3	-0,386 (0,028)***	-0,385 (0,027)***	-0,389 (0,027)***	-0,387 (0,026)***
dt_4	-0,466 (0,033)***	-0,464 (0,033)***	-0,465 (0,032)***	-0,466 (0,033)***
dt_5	-0,545 (0,036)***	-0,542 (0,036)***	-0,542 (0,035)***	-0,538 (0,033)***
dt_6	-0,5632 (0,034)***	-0,559 (0,034)***	-0,563 (0,034)***	-0,562 (0,034)***
dt_7	-0,48 (0,043)***	-0,478 (0,044)***	-0,478 (0,043)***	-0,48 (0,043)***
dt_8	-0,445 (0,048)***	-0,441 (0,047)***	-0,44 (0,047)***	-0,438 (0,046)***
LSDV R-squared	0,817	0,818	0,819	0,820
Within R-squared	0,589	0,590	0,592	0,594

N. of observations: 408 with 51 cross-sectional units. Time series length: 8 years. S. Deviation of dependent variable 0,329. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

[84] *Chapter I, subparagraph 1.1.1, page 10 and subparagraph 1.1.2, page 17.*

Table 20 offers results for the first decomposition of the full sample, which considers the smallest banks with averages of total assets up to euro 27,88 billion. This first subsample, is characterized of high variability in data and the within R-squared moves from 0,43 to 0,45 among the four columns where explanatory variables are added, one at time.

It appears clearly that no one of the estimated beta coefficients is able to correctly predict the true values of beta since that no one appears to be statistically significant.

Return on Equity estimated beta coefficient is so small that variations on the profitability ratio are almost not linked with variations of returns index. Only in column D, which attains the model where all the explanatory variables are implemented, ROE beta coefficients equalize the one obtained for the full sample, even remaining statistically insignificant. Considering Net Interest Margin, things are even more complicated: A positive variation of this financial ratio is associated, on average, with a considerable negative variation in stock returns. However, it must be considered that the statistically insignificance of beta estimate implies that the null hypothesis for which the true beta is equal to zero cannot be rejected.

Although also the estimated beta coefficients of Net Loans to Total Assets, Loan Loss Reserves to Gross Loans and Cost-to-Income ratio are all statistically insignificant, their signs are consistent with the expected ones: the first enters regression results with a positive signs, that confirms the previous finding for which a more traditional business activity is valued more by the market; the second suggests a positive impact of more prudent management decisions; the third highlights the importance for a bank to maintain costs without imposing prejudices to its profitability.

Contrary to what happens with estimated coefficients of explanatory variables, all the time-dummies appear to be statistically significant at 1% level: they allow the model to account for time specific fixed effects that modify the intercept of regression by considering specific events that could be correlated with changes in the dependent variable.

According with results obtained in table 19 for the full sample, external factors appear to have strong negative effects. In detail, it is confirmed that the greatest impacts are registered in the dummy variables that control for the years when the U.S banking crisis and the euro-area sovereign debt crisis revealed their seriousness.

Table 20: Fixed Effects model using Robust (HAC) standard errors.
Small banks of full sample, excluding T1R. Dependent variable: RI

	A	B	C	D
Constant	0,011 (0,045)	0,005 (0,04)	0,000 (0,043)	-0,003 (0,040)
ROE	0,000 (0,002)	0,000 (0,002)	0,000 (0,002)	0,001 (0,002)
NIM	-0,144 (0,097)	-0,144 (0,098)	-0,126 (0,096)	-0,140 (0,094)
NLTA		0,112 (0,096)	0,118 (0,096)	0,119 (0,098)
LLRGL			0,029 (0,019)	0,038 (0,025)
CIR				-0,073 (0,070)
dt_2	-0,428 (0,052)***	-0,43 (0,052)***	-0,43 (0,051)***	-0,417 (0,052)***
dt_3	-0,346 (0,046)***	0,348 (0,047)***	-0,35 (0,044)***	-0,343 (0,041)***
dt_4	-0,389 (0,054)***	-0,383 (0,055)***	-0,380 (0,052)***	-0,380 (0,051)***
dt_5	-0,449 (0,055)***	-0,443 (0,055)***	-0,44 (0,053)***	-0,434 (0,050)***
dt_6	-0,500 (0,058)***	-0,492 (0,058)***	-0,497 (0,056)***	-0,492 (0,055)***
dt_7	-0,401 (0,069)***	-0,395 (0,070)***	-0,392 (0,068)***	-0,391 (0,065)***
dt_8	-0,321 (0,073)***	-0,313 (0,073)***	-0,31 (0,072)***	-0,305 (0,068)***
LSDV R-squared	0,758	0,759	0,764	0,766
Within R-squared	0,435	0,439	0,449	0,454

N. of observations: 208 with 26 cross-sectional units. Time series length: 8 years. S. Deviation of dependent variable 0,336. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration.

The biggest ones of the fifty-one banks included in the full sample are considered in the regressions whose results are shown in table 21. Contrary to what happened with the previous subsample, this models are characterized by high ability to explain changes in the dependent variable. Even in the first column of the table, which includes only profitability ratios (along with the intercept and the time dummies), the within R-squared is 0,805. The inclusions of the other independent variables are not able to materially increase it, which stops in the last column at 0,809. As a matter of fact, except of the intercept and the dummies, profitability ratios are the most statistically significant ones with estimated beta coefficients equal to the

ones accounted for the full sample (table 19). Net Loans to Total Assets estimates do not appear to be significant at all, as well as Cost-to-income ones. Nonetheless, the signs of their estimates are conform to the ones of the full sample: positive for the first and negative for the second. Differently, Loan Loss Reserve to Gross Loans enters the regression with a negative sign and a statistically significant relation at 5% level. The negative relation is maintained even in the column D where Cost-to-Income ratio is included, however, in this last case it decreases significance at 10% level.

Table 21: Fixed effects model using Robust (HAC) standard errors.
Big banks of full sample, excluding T1R. Dependent variable: RI

	A	B	C	D
Constant	-0,123 (0,025)***	-0,124 (0,024)***	-0,126 (0,024)***	-0,126 (0,024)***
ROE	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)**
NIM	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***
NLTA		0,035 (0,034)	0,011 (0,037)	0,012 (0,036)
LLRGL			-0,042 (0,016)**	-0,038 (0,019)*
CIR				-0,014 (0,018)
dt_2	-0,511 (0,027)***	-0,511 (0,027)***	-0,499 (0,026)***	-0,497 (0,025)***
dt_3	-0,429 (0,029)***	-0,428 (0,028)***	-0,413 (0,028)***	-0,414 (0,025)***
dt_4	-0,541 (0,028)***	-0,542 (0,027)***	-0,534 (0,026)***	-0,535 (0,026)***
dt_5	-0,635 (0,027)***	-0,632 (0,026)***	-0,624 (0,026)***	-0,623 (0,026)***
dt_6	-0,637 (0,033)***	-0,634 (0,031)***	-0,617 (0,030)***	-0,618 (0,031)***
dt_7	-0,554 (0,043)***	-0,553 (0,042)***	-0,546 (0,042)***	-0,549 (0,042)***
dt_8	-0,561 (0,048)***	-0,559 (0,047)***	-0,555 (0,046)***	-0,555 (0,046)***
LSDV R-squared	0,861	0,862	0,864	0,865
Within R-squared	0,805	0,806	0,808	0,809

N. of observations: 200 with 25 cross-sectional units. Time series length: 8 years. S. Deviation of dependent variable 0,259. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

Due to the fact that positive changes of Loan Loss Reserve to Gross Loans ratio could be attributed either to an increase in bank prudence or to a decrease in loans portfolio quality, the negative sign of the coefficient could be linked to some form of investors' aversion that interpret the positive changes in the ratio as signals of decrease in loans quality.

Again, time dummies are all statistically significant at 1% with negative signs that state for external influences linked with the period considered in the analysis.

The next three tables present results obtained for the narrow sample that considers only banks for which Tier 1 ratio data are available.

First of all, Table 22 shows results for the whole sample composed of thirty-six banks. The model shows, yet in the first column, a good ability to explain Return index variations with an R-squared of 0,71 that increases with the inclusion of explanatory variables until it reaches the maximum of 0,733 in column E. This result is confirmed by the statistic significance of estimated beta coefficients. Starting with ROE and Net Interest Margin, which are the only variables considered in the first column (except for the intercept and the time dummies), both have a positive – although weak – relation with return index, and both are statistically significant at 1% level. Particularly, for Net Interest Margin significance is never altered by the inclusion of the other variables while, the significance of ROE decreases at 5% level after the inclusion of Cost-to-Income ratio (perhaps for the same reasons argued in explaining table 19).

Differently from all the previous cases, considering this restricted sample, Net Loans to Total Assets enter the regression with an estimated beta coefficient that is positive and statistically significant at 5% level. Moreover, the coefficient reveals a moderate relation with return index so that a positive variation in the ratio, linked with a more traditional business model is correlated with a positive variation in stock return. Also the variation in Cost-to-income ratio enters the analysis with an estimate that is statistically significant at 1% level and with a sign that is in accordance with the expected one. Indeed, an increase in inefficiency is correlated with a decrease in market valuation, measured by the change in return index. The same decrease follows positive variations in Tier 1 ratios that enter the analysis in the last column with an estimated beta coefficient that is negative and statistically significant at 10% level. A possible explanation of this relation could be that investors negatively react to increases in capital requirements. Loan loss reserve to gross loans is the only explanatory variable that appears to be statistically insignificant with estimated beta coefficient that shows also a weak relation with the dependent variable.

For which regard the seven dummy variables, previous results are confirmed even in this analysis: the presence of a negative trend due to some time fixed effects is verified by the

statistically significant beta coefficients of these variables. Moreover, it is also confirmed that the estimated beta coefficient could be linked with the getting worse of the financial crises.

Table 22: Fixed effects model using Robust (HAC) standard errors.
Narrow sample, including T1R. Dependent variable: RI

	A	B	C	D	E
Constant	-0,057 (0,034)*	-0,071 (0,035)**	-0,071 (0,034)**	-0,072 (0,033)**	-0,072 (0,033)**
ROE	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)**	0,001 (0,000)**
NIM	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***	0,001 (0,000)***
NLTA		0,317 (0,158)**	0,319 (0,153)**	0,318 (0,162)*	0,305 (0,161)*
LLRGL			0,002 (0,031)	0,016 (0,030)	0,019 (0,030)
CIR				-0,064 (0,024)***	-0,068 (0,025)***
T1R					-0,031 (0,016)*
dt_2	-0,457 (0,037)***	-0,458 (0,037)***	-0,458 (0,037)***	-0,445 (0,036)***	-0,44 (0,036)***
dt_3	-0,415 (0,034)***	-0,404 (0,034)***	-0,405 (0,036)***	-0,402 (0,034)***	-0,396 (0,034)***
dt_4	-0,501 (0,039)***	-0,491 (0,038)***	-0,491 (0,039)***	-0,491 (0,038)***	-0,491 (0,038)***
dt_5	-0,589 (0,045)***	-0,577 (0,046)***	-0,577 (0,046)***	-0,565 (0,042)***	-0,561 (0,042)***
dt_6	-0,611 (0,042)***	-0,585 (0,044)***	-0,586 (0,045)***	-0,585 (0,043)***	-0,581 (0,043)***
dt_7	-0,557 (0,046)***	-0,545 (0,046)***	-0,545 (0,046)***	-0,55 (0,045)***	-0,547 (0,044)***
dt_8	-0,549 (0,051)***	-0,527 (0,052)***	-0,527 (0,052)***	-0,524 (0,051)***	-0,522 (0,051)***
LSDV R-squared	0,887	0,89	0,89	0,893	0,894
Within R-squared	0,717	0,724	0,724	0,731	0,733

N. of observations: 288 with 36 cross-sectional units. Time series length: 8 years. S. Deviation of dependent variable 0,349. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

Partially similar results are obtained considering the first half of banks in the sample, the smallest ones (table 23). Although the Within R-squared is lower than the previous case, starting from the 0,616 of the model in the first column and reaching 0,669 in the model that includes all the explanatory variables, many estimated beta coefficients appear to be statistically significant.

Table 23: Fixed effects model using Robust (HAC) standard errors.
Small banks of narrow sample, including T1R. Dependent variable: RI

	A	B	C	D	E
Constant	0,025	-0,003	-0,009	-0,017	-0,017
	(0,062)	(0,062)	(0,061)	(0,056)	(0,056)
ROE	0,001	0,002	0,002	0,001	0,001
	(0,000)**	(0,001)*	(0,001)**	(0,001)	(0,001)
NIM	-0,16	-0,208	-0,199	-0,221	-0,224
	(0,042)***	(0,042)***	(0,052)***	(0,043)***	(0,041)***
NLTA		0,639	0,653	0,704	0,665
		(0,299)**	(0,284)**	(0,285)**	(0,283)**
LLRGL			0,016	0,038	0,042
			(0,041)	(0,036)	(0,034)
CIR				-0,127	-0,149
				(0,050)**	(0,045)***
T1R					-0,069
					(0,027)**
dt_2	-0,398	-0,403	-0,399	-0,372	-0,371
	(0,064)***	(0,062)***	(0,065)***	(0,064)***	(0,063)***
dt_3	-0,407	-0,382	-0,381	-0,365	-0,356
	(0,059)***	(0,057)***	(0,055)***	(0,049)***	(0,048)***
dt_4	-0,471	-0,454	-0,451	-0,441	-0,442
	(0,071)***	(0,068)***	(0,067)***	(0,062)***	(0,063)***
dt_5	-0,524	-0,498	-0,494	-0,459	-0,457
	(0,084)***	(0,087)***	(0,083)***	(0,072)***	(0,073)***
dt_6	-0,601	-0,554	-0,551	-0,54	-0,533
	(0,080)***	(0,080)***	(0,077)***	(0,072)***	(0,072)***
dt_7	-0,539	-0,5	-0,497	-0,492	-0,484
	(0,082)***	(0,085)***	(0,081)***	(0,074)***	(0,073)***
dt_8	-0,504	-0,443	-0,439	-0,433	-0,43
	(0,088)***	(0,088)***	(0,086)***	(0,083	(0,084)***
LSDV R-squared	0,873	0,878	0,88	0,887	0,89
Within R-squared	0,616	0,637	0,639	0,661	0,669

N. of observations: 144 with 18 cross-sectional units. Time series length: 8 years. S. Deviation of dependent variable 0,393. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

The two main differences attain the profitability ratios. ROE enters the regression with a weak, positive relation that is statistically significant at 5% level. Its significance decreases after including Net Loans to Total assets and then increase again at 5% level in column C where also Loan Loss Reserve to Gross Loans is considered. Nevertheless, it becomes statistically insignificant after the introduction of Cost-to-income ratio.

Another concerning aspect attains the sign of the relation between Net Interest Margin and the return index. It seems that a positive variation in this financial ratio is linked with a

negative reaction of the market. Furthermore, this negative, moderate, relation appears to be statistically significant at 1% level even introducing all the other variables. Considering that similar results have been obtained for the first half of the entire sample (although in that case the relation appeared to be statistically insignificant) maybe this finding could be attributed to high variability in the data of the smallest banks.

Accordingly with findings obtained in table 22, Net Loans to Total Assets estimated beta coefficient shows a positive strong relation with stock return index that is also statistically significant at 5% level. The positive effect of a traditional banking system is maintained even in the columns that include other explanatory variables: Loan Loss reserve to Gross Loans, Cost-to-Income and Tier 1 ratio. While the estimated beta coefficient of the first does not appear to be statistically significant in anyone of the three columns, the other two variables enter the analysis with estimated beta coefficients that follow the trend previously examined for the whole sample. Particularly, Cost-to-income ratio has a negative, weak, and statistically significant relation with stock index return; with the significance that increase from 5% level to 1% level in the last column that includes the Tier 1 ratio. Even this last, has a negative weak relation with stock returns and it is significant at 1% level.

As in all the previous cases analysed, time dummies are all statistically significant at 1% level and accounts for some time-fixed and negative effects.

The last results to be presented attain the second subsample composed of the biggest banks. Table 24 shows that even in column A – which considers only profitability ratios – the model has a within R-squared of 0,857 that further increases with the inclusion of the other variables until the maximum of 0,863 reached in column D and maintained in column E, that is the column where Tier 1 Ratio effects are studied.

The first things to be considered are the estimated beta coefficients of profitability ratio, that are again statistically significant and that denote the presence of a positive – although weak – relation with variations in stock returns.

As it has been accounted for the biggest bank of the sample composed of fifty-one banks, Loan Loss Reserve to Gross loans enter the analysis with a negative, weak beta coefficient with a relation that is statistically significant at 5% level only before the introduction of Cost-to-Income ratio. This last is significant at 1% level with estimated beta coefficient that is always negative and near zero.

Differently from tables 22 and 23, Net Loans to Total Assets does not appear to be statistically significant even if its inclusion increases slightly the within R-squared. Anyway, it enters the regression with a positive estimated beta coefficient. The same is valid for Tier 1 Ratio: positive changes in this ratio are not linked anymore with negative reactions of

investors. Plausibly an increase in regulatory capital for the biggest banks, that are also the ones most exposed to risk and that are recognized as systematically important even by regulators, is not associated with a decrease of market returns even considering that these banks should be in any case able to preserve their profitability. Anyway, these assertions are not confirmed on a statistic point of view, since that the relation appear to be insignificant.

Finally, even in this subsample are maintained all the negative, moderate, and statistically significant relations between time dummies and stock returns, confirming the impact that the exacerbating of the crisis could have had on banks' stock returns.

Table 24 Fixed effects model using Robust (HAC) standard errors.
Big banks of narrow sample, including T1R. Dependent variable: RI

	A	B	C	D	E
Const	-0,134	-0,137	-0,139	-0,137	-0,137
	(0,025)***	(0,025)***	(0,025)***	(0,025)***	(0,025)***
ROE	0,002	0,002	0,002	0,002	0,002
	(0,001)***	(0,001)**	(0,001)**	(0,001)**	(0,001)**
NIM	0,001	0,001	0,001	0,001	0,001
	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***
NLTA		0,131	0,131	0,118	0,118
		(0,092)	(0,090)	(0,090)	(0,090)
LLRGL			-0,026	-0,013	-0,013
			(0,012)**	(0,011)	(0,011)
CIR				-0,032	-0,032
				(0,011)***	(0,011)***
T1R					0,001
					(0,012)
dt_2	-0,522	-0,522	-0,515	-0,511	-0,511
	(0,031)***	(0,032)***	(0,031)***	(0,030)***	(0,030)***
dt_3	-0,444	-0,442	-0,432	-0,434	-0,434
	(0,034)***	(0,033)***	(0,032)***	(0,032)***	(0,032)***
dt_4	-0,551	-0,546	-0,541	-0,545	-0,545
	(0,025)***	(0,024)***	(0,024)***	(0,023)***	(0,023)***
dt_5	-0,649	-0,645	-0,641	-0,638	-0,639
	(0,028)***	(0,028)***	(0,027)***	(0,027)***	(0,027)***
dt_6	-0,638	-0,628	-0,616	-0,621	-0,621
	(0,032)***	(0,033)***	(0,032)***	(0,032)***	(0,032)***
dt_7	-0,58	-0,578	-0,575	-0,581	-0,581
	(0,040)***	(0,039)***	(0,038)***	(0,039)***	(0,039)***
dt_8	-0,583	-0,576	-0,574	-0,573	-0,573
	(0,044)***	(0,044)***	(0,044)***	(0,043)***	(0,043)***
LSDV R-squared	0,898	0,899	0,901	0,902	0,902
Within R-squared	0,857	0,859	0,861	0,863	0,863

N. of observations: 144 with 18 cross-sectional units. Time series length: 8 years. S. Deviation of dependent variable 0,254. Standard Errors in parenthesis; *, ** and *** denote significance level at 10%, 5% and 1% respectively.
Source: author's elaboration

Conclusions

The work presented in this thesis could be included in the set of studies regarding the *value relevance.* These two terms refer to the ability of financial statement information to impact firms' market value.

The argument is not free from criticisms, Holthausen and Watts (2001) denote the restricted influence of such studies for standard setting purposes, arguing that in absence of a specific theory that describes the empirical association, those researches cannot be useful and remain mere associations.

Nonetheless, Barth, Beaver and Landsman (2001) in their article reply to Holthausen and Watts showing the pertinence of these researches for accounting standard stetting, particularly, considering the complexity of financial markets, which increase over time. They make clear that these studies are aimed to explain stocks market values rather than firms' value distinguishing two approaches through which researches can be developed: (i) in term of level of firm value, to determine what is reflected in share price; or (ii) in term of change in share price, in order to explain what is reflected in stock return.

Accordingly with Barth, Beaver and Landsman (2001), Anandarajan et al. (2011) explain that the expansion of value relevance literature follows the globalization of financial markets and the increase in international investments. These authors recognize in the samples the main limits of these studies, observing that it is difficult to provide correct results and inferences on value relevance studies whose samples gather entities of different industries. Moreover, they argue that the banks' prominent role on international economics development and the increasing consolidation of the financial sector make bank's value relevance analyses particularly interesting, although cross country differences in banks' financial statements could constitute one of their limits.

As a matter of fact, last years have shown the extent of damages that a shock in the banking sector could have on the entire economy and how financial instruments can spread the crisis from the U.S. to all over the world, reaching public debts, with governments crushed by banks' bailouts, and real economies, blocked-out by credit crunch. These dramatic circumstances reopen debates on banks regulation and supervision, challenging EU authorities to provide the entire system of a more reliable and harmonized framework through which increase transparency, soundness and resilience of the system.

In accordance with Anandarajan et al. (2011) a crucial point remains the transparency and the harmonization of banks' financial statements. Even after the introduction of IAS/IFRS, they are still characterized by management directionality especially with regards the evaluation of financial instruments, that constitute the largest portion of banks' assets and liabilities: Although the international accounting standards provide for the adoption of *fair value* method for their measurement, fair value coincides with market value only when there is an active liquid market for the instruments. If it does not exist, the estimation of *fair value* can rely only on internal "asset pricing models". In this last case, despite the fact that banks are obliged to disclose all these information in the notes, financial statements users are not able to perfectly reproduce such estimations and have to rely on banks' proposals.

The debate is particularly heated so that a lot of studies reported in the literature review attain the relevance of fair value estimates, with references to investment securities, off-balance sheet items and loans.

Other studies presented in the literature review attain the value relevance of banks' capital structure, diversification and rating changes.

This work rests on two groups of studies that develop value relevance analyses applying the two approaches described by Barth, Beaver and Landsman (2001).

First of all Market-to-Book ratio analysis has been presented, following the work of Ming-Li and Liang (2005), Jordan et al. (2011) and Macit and Topaloglu (2012). Then, with references to the works of Cooper, Jackson III and Patterson (2003) and Romagnoli (2007), banks' Market-to-Book ratios have been substituted by bank's stock returns.

Both analyses consider Euro-Area commercial and cooperative banks publicly listed during the period between 2006 and 2014. This sample is a statistical structure where time series and cross sectional units are combined together in a data set known as panel of data. With regards to financial ratios, they are similar to those used in the over mentioned studies and concern: (i) profitability, measured by ROE and Net Interest Income; (ii) efficiency, measured by the Cost-to-Income ratio; (iii) riskiness, with the Loan Loss Reserve to Gross Loans ratio; (iv) business activity, accounted by the Net Loans to Total Assets; and (v) capital adequacy, represented by the Tier 1 ratio. This last variable is not available for a lot of banks and, for this reason, both analysis are conducted for the whole sample, without including capital adequacy and for a restricted sample that considers only the banks for which Tier 1 data are available.

With reference to the first analysis, Market-to-book ratio constitutes the dependent variable of a regression whose explanatory variables are the financial ratios plus the variable "EuroStoxxBanks", which take into account the market trend of the banking sector.

Considering the structure of the sample, a first kind of analysis has been conducted adopting a Fixed Effects model; the choice has been confirmed by the Hausman test. Moreover, in order to correct for heteroskedasticity, Arellano's robust standard errors have been considered. Unfortunately, the White test revealed that, even with their adoption, heterosckedasticity problems have not been resolved. For this reason, using Gretl software has been performed also a Weighted Least Square regression with weights based on per-unit error variances.

Results confirm expectations for which the market values more banks: (i) whose profitability, measured by ROE, is higher; (ii) that are more diversified; and (iii) more prudent in evaluating their Loans portfolio. Cost-to-Income ratio and EuroStoxxBanks, although significant, do not seem to provide huge variations in market valuation. These results are confirmed for the subsample that considers only the smallest banks, even if the Adjusted R-squared of this model is much lower, probably because of a higher variability in data. Results of the model that studies the biggest banks change drastically during the stepwise inclusion of explanatory variables. Nonetheless when all variables are considered, the model reaches the highest Adjusted R-squared. ROE and Loans Loss Reserve to Gross Loans have a positive relation with Market-to-Book ratio before the introduction of the efficiency ratio and of EuroStoxxBank. Then, only the latter and the Loan Loss Reserve to Gross Loans are the variables that seem to have a positive and statistically significant relation with Market-to-Book ratio.

The narrow sample of banks with available Tier 1 ratio data appears to have high variability in data, especially for the subsample of the smallest banks. The capital adequacy variable enters all the three regressions (for the whole sample and for the two subsamples) with negative, even if very low, estimated beta coefficient that is, almost in all cases, statistically significant. This result contrasts with Jordan et Al. (2011) and Macit and Topaloglu (2012), which find, respectively for the U.S. and the Turkish banking system, a positive correlation between the capital ratio and the Market-to-Book ratio. Profitability ratios results are in accordance with those obtained in previous researches.

In the second analysis, market stock returns substitute the Market-to-book ratios. These returns are calculated by Thomson Reuters – Eikon as the product between the Returns of the previous period and the changes in share prices, taking into account dividends policies.

In order to maintain the comparability between the dependent variable and the explanatory variables, financial ratios have been considered as annual percentage changes. These adjustments imply a reduction in the time period of analysis that is composed of the years between 2007 and 2014.

Another difference between the two analyses attains the variable EuroStoxxBanks that was included in the first model in order to take into account possible external effects linked to the market. This last analysis does not consider such variable: the presence of possible time-specific fixed effects (as the exacerbating of the financial crisis) is accounted by T-1 time dummies. Even in this case has been developed a Fixed Effects model to perform the analysis and again this choice has been supported by the Hausman's test. Heteroskedasticity has been taken into account by ordering the statistic package Gretl to consider Arellano's robust standard errors and, contrary to the previous analysis, through the White's test it has been ascertained that Arellano's robust standard errors combined with time dummies are able to correct for the absence of homoscedasticity assumption.

Results of the model that do not consider Tier 1 Ratio show the presence of a positive, even if low, relation between changes in returns and profitability ratio that is confirmed also considering the sub-sample of the biggest banks. In this analysis, changes in Loans Loss Reserve to Gross loans appear to have a negative impact on changes in stock returns.

The models that include Tier 1 ratio suggest the presence of a positive relation between changes in stock return and changes in: profitability and business activity ratios. On the other hand changes in Cost-to-Income ratio and Tier 1 ratio are negatively correlated with changes in stock return. It should be noted that these results are affected by high variability of data, concentrated on the subsample composed of the smallest banks. Here Net Interest Margin appears with a negative and statistically significant beta coefficient. This finding is not obtained in the regression that consider the biggest bank, where both profitability ratios appear again to positively influence changes in stock returns. Cost-to-income ratio has a negative influence while Tier 1 ratio does not appear to be significant.

The presence of a positive correlation between profitability ratios (except results obtained for small banks) and stock returns confirms findings obtained by Cooper, Jackson III and Patterson (2003) for the U.S. banking system as well as the ones obtained by Romagnoli (2007) in a study about the Italian banking system. Considering this latter study, the presence of a diversification discount and the insignificance of capital adequacy ratio are also confirmed. It should be noted that for the U.S. banking system Cooper, Jackson III and Patterson (2003) found a positive and significant relation between capital ratios and market returns.

One important consideration attains the limits of these analyses. First of all, as it has been point out, it should be considered that the sample is characterized by high variability of data. This variability is partially explained by considering that the time horizon includes all the years of the financial crisis. Another plausible explanation could be that the banks in the

sample are very different among each other not only for which regards the amount of their total assets but especially for which regards the activities carried out by these banks. As a matter of fact, even Authorities have established to distinguish a group of *significant banks,* taking into consideration not only their size but also their importance for the economy of the Member State and the significance of their cross-border activities. Results also shows that this variability is present, most of all, in the sub sample composed of small banks.

Following this reasoning, the first adjustments that should be considered for further developments could attain the sample: (i) considering different time horizon; (ii) increasing the number of banks analysed; (iii) imposing databases further prerequisites to include one bank in the analysis. None the less, it should also be considered that a further selection could cause the sample to be so small that the reliability of statistical inferences could be in any case compromised.

Both analyses could be improved by considering different explanatory variables: for example, instead of the Cost-to-Income ratio, it could be used as measure of efficiency the bank's percentage difference in "Cost X-Efficiency" compared to the best benchmark banks, as proposed by Jordan et al. (2011). Moreover, following Romagnoli (2007), the models could take into account also bank's liquidity by adding the ratio between interbank assets and liabilities. Finally it could be considered also the inclusion of a variable that accounts for banks' rating changes.

Regarding Heteroskedasticity problems, Market-to-book ratio analysis have been corrected by considering Gretl automatic Weighted Least Squared regression with weights based on per-unit error variances. Further econometric researches could be conducted so as to define which variable could be used as weight in a manual WLS regression. This attempt requires advanced econometric techniques and lies outside the present analysis.

Last but not least, one should consider that the present study cannot be interpreted as a proof of causality between market values and financial information not only for the limits previously described or for the possible presence of omitted variables but because of the context that we are trying to explain: although the explanatory variables considered in this study are not correlated among each other, there are still many connected aspects inherent banks management that the statistical models are not able to perfectly synthetize and that could drive the inconsistency of some of the results.

After the financial crisis, in the attempt to provide for a more soundness banking system, regulators starts to impose stricter and stricter capital requirements, especially in terms of capital of the best quality (Common Equity Tier 1). In order to accomplish with these standards banks have to sacrifice resources that could be invested in more profitable financial

instruments reducing at the same time their risky exposures. These could lead to a reduction in banks' profitability that, in turn, could deter capital increases since banks' shares become less desirable.

Furthermore, as it has been previously explained, investors are not really able to understand the asset pricing models used by banks in evaluating their financial assets nor they are able to evaluate the methods through which banks calculate Non-performing loans adjustments. The possibility that banks' capital do not consider adequately the losses that could arise from non performing exposures could be the reason for which an increase in Loan Loss Reserve to Gross Loans is positively correlated with market values.

These are only some of the arguments that characterize the current debate between investors, regulators and bankers; a lot of other inferences are constantly proposed by these actors so that it could not be obvious to ascertain if and in which measure a statistical model could take into account all of them so that to demonstrate a causal relationship.

Annex: Banks in the sample

BANK NAME	COUNTRY
Bnp Paribas	FR
Deutsche Bank AG	DE
Crédit Agricole S.A.	FR
Société Générale SA	FR
Banco Santander SA	ES
Unicredit	IT
Intesa Sanpaolo	IT
Banco Bilbao Vizcaya Argentaria SA	ES
Commerzbank AG	DE
Crédit Industriel et Commercial SA - CIC	FR
Banca Monte dei Paschi di Siena	IT
Banco de Sabadell SA	ES
Banco Popular Espanol SA	ES
Deutsche Postbank AG	DE
Banco Popolare - Società Cooper	IT
Unione di Banche Italiane Scpa-UBI Banca	IT
Raiffeisen Bank International AG	AT
National Bank of Greece SA	GR
Allied Irish Banks plc	IE
Piraeus Bank SA	GR
Banco Comercial Português, SA-M	PT
Eurobank Ergasias SA	GR
Alpha Bank AE	GR
Banca popolare Emilia Romagna	IT
Bankinter SA	ES
Banca Popolare di Milano SCaRL	IT
Raiffeisenlandesbank Oberösterr	AT
Banca Carige SpA	IT
Caisse régionale de crédit agricole mutuel de Paris et d'Ile-de-France SC	FR

Banca Popolare di Sondrio SCpA	IT
Credito Emiliano spa	IT
Banca Piccolo Credito Valtellinese	IT
Caisse régionale de crédit agricole mutuel Nord de France SC	FR
Oberbank AG	AT
Caisse Régionale de crédit agricole mutuel Atlantique Vendée SC	FR
Caisse régionale de credit agricole mutuel d'Alpes-Provence SC	FR
Caisse régionale de credit agricole mutuel Sud Rhône -Alpes SC	FR
Caisse régionale de crédit agricole mutuel de Normandie-Seine	FR
Banco di Desio e della Brianza	IT
Banco di Sardegna SpA	IT
Caisse régionale de credit agricole mutuel de la Touraine et du Poitou SC-	FR
Vseobecna Uverova Banka a.s.	SK
Caisse régionale de crédit agricole mutuel de l'Ille-et-Vilaine SA	FR
Tatra Banka a.s.	SK
Caisse régionale de crédit agricole mutuel Loire Haute-Loire SC	FR
Bank für Tirol und Vorarlberg AG-BTV	AT
Caisse régionale de Crédit Agricole mutuel du Morbihan SC	FR
Caisse Régionale de Crédit Agricole Mutuel Toulouse 31 SC	FR
Hellenic Bank Public Company Li	CY
HSBC Bank Malta Plc	MT
BKS Bank AG	AT
Attica Bank SA	GR
Volksbank Vorarlberg e.Gen.	AT
Prima banka Slovensko a.s.	SK
Siauliu Bankas	LT
OTP Banka Slovensko, as	SK

References

Books and Papers

Agostino, M., Drago D. and Silipo, D. B., 2011. *The value relevance of IFRS in the European Banking Industry.* Review of Quantitative Finance and Accounting 36, 436-457.

Ahmed, A.S., Kilic, E. and Lobo, G.J., 2006. *Does Recognition versus disclosure matter? Evidence from Value-Relevance of banks' recognized and disclosed derivative financial instruments.* The Accounting Review 81(3), 567-588.

Altunbas, Y., Manganelli, S. and Marques-Ibanez, D., 2011. *Bank risk during the great recession: Do business models matter?* European Central Bank, Mimeo

Anandarajan, A., Francis, B., Hasan, I. and John, K., 2011. *Value relevance of banks: global evidence.* Review of Quantitative Finance and Accounting 36, 33-55.

Baele, L., De Jonghe, O. and Vennet R.V., 2007. *Does the stock market value bank diversification?* Journal of Banking and Finance 31, 1999-2023.

Barth, M. E., 1994. *Fair value accounting: Evidence from investment securities and the market valuation of Banks.* The Accounting Review, 69(1), 1-25.

Barth, M.E., Beaver, W.H. and Landsman W.R., 1996. *Value relevance of banks' fair value disclosure under SFAS No 107.* The Accounting Review, 71(4), 513-537.

Barth, M. E., Beaver, W. H. and Landsman W. R., 2001. *The relevance of the value relevance literature for financial accounting standard setting: another view.* Journal of Accounting and Economics 31, 77-104.

Basel Committee on Banking Supervision (BCBS), October 2015. *A brief history of the Basel Committee.* Bank for International Settlement.

Basel Committee on Banking Supervision (BCBS), June 2004. *International Convergence of Capital Measurement and Capital Standards. A Revised Framework.* Bank for International Settlement.

Basel Committee on Banking Supervision (BCBS), December 2010. *Basel III: International framework for liquidity risk measurement, standards and monitoring.* Bank for International Settlement.

Beaver, W.H. and Ryan, S., 1993. *The accounting fundamentals of the book-to-market ratio*. Financial Analysts Journal 49, 50-56.

Berger, A. and Bouwman C., 2013. *How does capital affect bank performance during financial crises?* Journal of Financial Economics 109, 146-176.

Bonaccorsi di Patti, E., Felici, R. and Signoretti, F., 2016. *Euro area significant banks: main differences and recent performance*. Bank of Italy Occasional Papers, 306.

Bongini, P., Laeven, L. and Majnoni, G., 2002. *How good is the market at assessing bank fragility? A horse rage between different indicators.* Journal of Banking and Finance 26, 1011-1028.

Brooks, C., 2008. *Introductory Econometrics for Finance. Second Edition.* Cambridge University Press.

Cantor, R. and Johnson, R., 1992. *Bank capital ratios, asset growth, and the stock market.* Quarterly review – FRB of New York 17(3), 10-24.

Chang, M. and Leblond, P., 2015. *All in: Market expectation of Eurozone integrity in the sovereign debt crisis.* Review of International Political Economy, 22(3), 626-655.

Cooper, M.J., Jackson III, W. E. and Patterson, G. A., 2003. *Evidence of predictability in the cross-section of bank stock returns.* Journal of Banking & Finance 27, 817-850.

Council of the European Union, October 2013. *Council Regulation (UE) No 1024/2013.* Official Journal of European Union.

Davis, J. L., 2001. *Explaining Stock Returns: a literature survey*. Dimensional Fund Advisors Inc., available at the link: https://www.ifa.com/pdfs/explainingstockreturns.pdf

De Bandt, O., Camara, B., Pessarossi, P. and Rose, M., 2014. *Does the capital structure affect banks' profitability? Pre- and post-financial crisis evidence from significant banks in France.* Débats économiques et financiers n.12.

De Larosière, J., 2009. *The de Larosière report, The high-level group on financial supervision in the EU*, Brussels.

Drago, D., Mazzuca, M. and Trinca Colonel, R., 2013. *Do loans fair value affect market value? Evidence from European banks.* Journal of Financial Regulation and Compliance 21 (2), 108-120.

Eccher, E. A., Ramesh, K. and Thiagarajan, S. R., 1996. *Fair value disclosures by bank holding companies.* Journal of Accounting and Economics 22, 79-117.

Ernst & Young, May 2013. *IFRS changes impacting the banking industry: an update for the CFO second edition.*

European Commission, Memo/10/434. *Financial Supervision Package – Frequently Asked Questions.*

Euro Area Summit, 2012. *Euro Area Summit Statement, Brussels, 29th June 2012.* Document Available at: http://ec.europa.eu/economy_finance/crisis/2012-06_en.htm

Francis, J. and Schipper, K., 1999. *Have Financial Statements lost their relevance?* Journal of Accounting Researce 37 (2), 319-352.

Gropp, R. and Richards, A. J., 2001. *Rating agency action and the pricing of debt and equity of European banks: what can we infer about private sector monitoring of bank soundness?* Economic Notes 30(3), 373-398.

Hefferman, S., 2005. *Modern Banking.* JhonWiley & Sons.

Holthausen, R. W. and Watts, R. S., 2001. *The relevance of the value-relevance literature for financial accounting standard setting.* Journal of Accounting & Economics 31, 3-75

Huizinga, H. and Laeven, L., 2012. *Bank valuation and accounting discretion during a financial crisis.* Journal of Financial Economics 106, 614-634.

Jordan, D.J., Rice, D., Sanchez, J. and Wort, D.H., 2011. *Explaining bank market-to-book ratios: Evidence from 2006 to 2009.* Journal of Banking and Finance 35, 2047-2055.

Khurana, I.K. and Kim M.S., 2003. *Relative value relevance of historical cost vs. fair value: Evidence from banking holding companies.* Journal of Accounting and Public Policy 22, 19-42.

Laeven, L., Levine, R., 2007. *Is there a diversification discount in financial conglomerates?* Journal of Financial Economics 85, 331-367.

Lancaster, C., Hatfield, G. and Anderson, D., 1993. *Stock prices reactions to increases in Loan-Loss reserves: a broader perspective.* Journal of Economics and Finance 17, 29-41.

Lepetit, L., Nys, E., Rous, P. and Tarazi, A., 2008. *Bank income structure and risk: An empirical analysis of European banks.* Journal of Banking and Finance 32, 1452-1467.

Linciano, N., 2004. *L'impatto sui prezzi azionari delle revisioni dei giudizi delle agenzie di rating. Evidenza per il caso italiano.* Consob, Quaderni di Finanza n. 57.

Macit, F. and Topaloğlu, Z., 2012. *Why bank market value to book value ratios so different: evidence from turkish banking sector.* Economic and Business Review 14 (2), 169-179.

Marcellino, M, 2013. *Econometria applicata. Un'introduzione. Seconda edizione.* Egea.

Mehran, H. and Thakor, A., 2011. *Bank capital and value in the cross-section.* The Review of Financial Studies 24 (4), 1019-1067.

Ming-Li, Y. and Liang, C.J., 2005. *An investigation into the differences between the book value and market value of commercial banks: An empirical study.* International Journal of Management 22 (1), 89-100.

Nelson, K. K., 1996. *Fair Value Accounting for Commercial Banks: An Empirical Analysis of SFAS No. 107.* The Accounting Review 97(2), 161-182.

Nissim, D, 2003. *Reliability of bank's fair value disclosure for loans.* Review of Quantitative Finance and Accounting, 20, 355-384.

Ohlson, J., 1995. *Earning, Book Values and dividends in equity Valuation.* Contemporary Accounting Research, Spring 11(2), 661-687.

Paolucci, G. and Menicucci, E., 2008. Bilancio delle Banche e Principi IAS/IFRS – Riflessioni e prospettive. Giappichelli Editore – Torino.

President of the European Council, EUCO 120/2012. *Towards A Genuine Economic And Monetary Union – Report by President of the European Council Herman Van Rompuy*.

Resti, A. and Sironi, A., 2007. *Risk management and shareholder value in banking. From risk measurement to capital allocation policies.* Jhon Wiley & Sons Ltd.

Romagnoli, A., 2007. *Indici di bilancio e rendimenti di borsa: un'analisi per le banche italiane.* Bank of Italy Working Papers, 648.

Schweitzer, R., Szewczyk, S. H. and Varma, R., 1992. *Bond rating agencies and their role in bank market discipline.* Journal of Financial Services Research 6, 249-263.

Stiroh, K.J. 2006. *A portfolio view of banking with interest and noninterest activities.* Journal of Money, Credit and Banking 38(5), 1351-1361.

United States, Financial Crisis Inquiry Commission, 2011. *The financial crisis inquiry report: final report of the National Commission on the Causes of the Financial and Economic Crisis in the United States*. Government Printing Office.

Whalen, J. M., 1994. *The nature of information in commercial bank loan loss disclousures.* The Accounting Review 69, 455-478.

Wooldridge, J. M. , 2014. *Introduction to Econometrics.* Cengage Learing

Venkatachalam, M, 1996. Value relevance of banks' derivatives disclosures. Journal of Accounting & Economics 22, 327-355.

Legislation

Council of the European Union, 11225/2/2009. *Brussels European Council 18/19 June 2009 – Presidency Conclusions*.

Council of the European Union, October 2013. Council Regulation (EU) No 1024/2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions. Official Journal of European Union.

European Commission, COM/2009/0114 final. *Communication for the spring European Council, "Driving European Recovery", Volume 1*.

European Commission, COM/2010/0368 final. *Proposal for a Directive .../.../Eu Of The European Parliament And Of The Council on Deposit Guarantee Schemes [recast]*.

European Commission, COM/2012/0510 final. *Communication From The Commission To The European Parliament And The Council – A Roadmap towards a Banking Union.*

European Commission, COM/2012/0280 final. *Proposal for a Directive of the European Parliament and of the Council establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Council Directives 77/91/EEC and 82/891/EC, Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC and 2011/35/EC and Regulation (EU) No 1093/2010.*

European Commission, COM/2015/0286 final. Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 806/2014 in order to establish a European Deposit Insurance Scheme.

European Parliament and the Council of the European Union, July 2002. *Regulation (EU) no. 1606/2002 on Application of International Accounting Standards.* Official Journal of European Communities.

European Parliament and the Council of the European Union, March 2009. *Directive 2009/14/EC amending Directive 94/19/EC on deposit-guarantee schemes as regards the coverage level and the payout delay.* Official Journal of European Union.

European Parliament and the Council of the European Union, November 2010. *Regulation (EU) no. 1092/2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board.* Official Journal of European Union.

European Parliament and the Council of the European Union, November 2010. *Regulation (EU) no. 1093/2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC.* Official Journal of European Union.

European Parliament and the Council of the European Union, November 2010. *Regulation (EU) no. 1094/2010 establishing a European Supervisory Authority (European Insurance and Occupational Pensions Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/79/EC.* Official Journal of European Union.

European Parliament and the Council of the European Union, November 2010. *Regulation (EU) no. 1095/2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC.* Official Journal of European Union.

European Parliament and the Council of the European Union, June 2013. *Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.* Official Journal of European Union.

European Parliament and the Council of the European Union, June 2013. *Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.* Official Journal of European Union.

European Parliament and the Council of the European Union, October 2013. *Regulation (EU) No 1022/2013 amending Regulation (EU) No 1093/2010 establishing a European Supervisory Authority (European Banking Authority) as regards the conferral of specific tasks on the European Central Bank pursuant to Council Regulation (EU) No 1024/2013.* Official Journal of European Union.

European Parliament and the Council of the European Union, April 2014. *Directive 2014/49/EU on deposit guarantee schemes (recast)*. Official Journal of European Union.

European Parliament and the Council of the European Union, May 2014. *Directive 2014/59/EU establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Council Directive 82/891/EEC, and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU, 2012/30/EU and 2013/36/EU, and Regulations (EU) No 1093/2010 and (EU) No 648/2012, of the European Parliament and of the Council.* Official Journal of European Union.

European Parliament and the Council of the European Union, July 2014. *Regulation (EU) No 806/2014 establishing uniform rules and a uniform procedure for the resolution of credit institutions and certain investment firms in the framework of a Single Resolution Mechanism and a Single Reso- lution Fund and amending Regulation (EU) No 1093/2010.* Official Journal of European Union.

Databases and Websites

Bank for International Settlement: https://www.bis.org/

Bureau Van Dijk – Bankscope: https://bankscope.bvdinfo.com/version-2016620/home.serv?product=scope2006

European Banking Authority: http://www.eba.europa.eu/

European Central Bank: https://www.ecb.europa.eu/home/html/index.en.html

European Commission: http://ec.europa.eu/index_en.htm

Eur Lex: http://eur-lex.europa.eu/homepage.html

European Parliament: http://www.europarl.europa.eu/portal/en

Thomson Reuters – DataStream: http://financial.thomsonreuters.com/en/products/tools-applications/trading-investment-tools/datastream-macroeconomic-analysis.html

Thomson Reuters – Eikon: http://financial.thomsonreuters.com/en/products/tools-applications/trading-investment-tools/eikon-trading-software.html