UNIVERSITA' DEGLI STUDI DI PADOVA

DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI "M. FANNO"

CORSO DI LAUREA MAGISTRALE IN BUSINESS ADMINISTRATION

TESI DI LAUREA

"DOES MANAGEMENT PAY REACT TO SIGNALS OF ACCOUNTING QUALITY? EVIDENCE FROM THE BANKING INDUSTRY"

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ANNO ACCADEMICO 2017 – 2018

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Abstract

The thesis empirically investigates the relationship between accounting quality and executive compensation in the banking industry. The analysis is developed by detecting and testing four distinct agency relationships relating to four management groups: the members of the Board of Directors, the members of the Supervisory Board, the CEO, and the Key Management Personnel. The data reveal that BOD members compensation is significantly affected by evidence of low accounting quality, while Supervisory Board members' compensation isn't. The evidence is found to be inconclusive for what concern CEO and KMP pay-sensitivity.

Acknowledgements

First and foremost, I dedicate this thesis to my parents and my brother, whose support was key in going through these difficult and wonderful years of study. A special thank goes to my mother Maida, whose inextinguishable love is my greatest source of strength.

In addition, I would like to thank all and only the professors who during their lectures have tried to give me and my fellow students something more than a loosely connected set of notions. If it wasn't for your passion for teaching and your willingness to supply a deep understanding of the subject, without saving on subtleties and insights, my years spent here would have been much more tough and much less enriching. You all enabled me to pursue a path of intellectual growth that will shape my life forever.

Last but not least, a special thanks goes to my thesis advisor prof. Amedeo Pugliese, whose help was pivotal in completing this work.

"I am certain, however, that nothing has done so much
to destroy the juridical safeguards of individual freedom
as the striving after this mirage of social justice"

FRIEDRICH AUGUST VON HAYEK

Summary

Introduction

Banks are fundamental actors within developed economies due to their central role as allocators of scarce capital resources. By gathering savings and providing loans to maximize profits, they enable the most productive firms to prosper and market efficiency to materialize. However, market imperfections in the form of adverse selection and moral hazard hinder the functioning of this mechanism, and call for ad hoc solutions. In relation to the latter problem, a primary answer to information asymmetries linked to moral hazard is given by external reporting. The disclosure of relevant performance information makes banks accountable for their actions, and enable stakeholders to exert control on the firm to grant the satisfaction of their claims. However, as the Venetian Banks Crisis demonstrated, the effectiveness of this control strongly depend on the quality of the information provided. In the specific case of financial reporting, where accounting evidence is used by shareholders to assess economic performance, this situation pose the issue of whether the agency problem within equity investors and management is effectively settled. In fact, a critical problem related to assessing executive performance on financial reporting is that the process of financial reporting is in the hand of executives themselves. In consideration of this, the assessment of the nature of this agency relationship necessarily pass from the analysis of the agents' payoff. Indeed, being the payoff the main lever in the hand of the principal, only the examination of its features can unveil the nature of the underlying bond. Are shareholders in control of the relationship, and so are they able to penalize agents that mystify reported performance? Or are they in the hand of agents, for whom financial reporting is just another way to disguise their actions and extract rents? This raises the issue of the link between accounting quality and executive compensation in the banking industry.

These topics have been separately studied from corporate governance and financial accounting scholars both within and outside the banking sector. However, evidence on the link between the two is limited, especially within the banking literature. Studies on industrial firms point to the fact that, while on one side certain compensation arrangements such as stock grants tend to hinder accounting quality, on the other side higher accounting quality results in higher pay-for-performance sensitivity. Enlarging the scope of the analysis beyond management pay, evidence suggest that executives suffer labor market consequences such as higher turnover in firm with lower accounting quality. Overall, although limited, the research suggests that accounting quality can have material effects on managers payoffs. However, a research gap exists in

relation to the direct link between accounting quality and management pay. This is what this thesis aims at addressing.

The analysis starts in Chapter 1 where, taking the moves from the separation of ownership and control, the topic of agency relationship and the need for monitoring agents' actions is developed to arrive at the issue of accounting quality. Here the fundamental question is posed: can shareholders enforce their interests to a reliable financial reporting through compensation setting? The thesis proceeds in Chapter 2 with the examination of the relevant theory and evidence who, together with the analysis of the 2014 ECB Comprehensive Assessment in Chapter 3, sets the basis for the development of the research design in Chapter 4. Here four research hypotheses are developed, concerning the agency relationship of shareholders with four corporate bodies: the Board of Directors, the Supervisory Board, the CEO, and the Key Management Personnel. Subsequently these four hypotheses are empirically tested in Chapter 5. The empirical test is performed by gathering data concerning executive compensation from a set of banks subject to the aforementioned independent assessment of their balance sheets by the ECB. The test revealed that BOD compensation is highly sensitive to signals of accounting quality, while the one of SB is immune to this same effect. For what concern CEO and KMP, the data proved inconclusive.

Chapter 1 – Monitoring and Acting on Performance Information

1.1 – Financial Reporting and Economic Welfare

Financial statements are a primary source of information on a company's economic and financial performance, and as such they are an important mean of communication with the various stakeholders surrounding an enterprise. Indeed, those interested in the economic performance of a firm are not only the holders of debt and risk capital, but also employees, customers and suppliers, and by extension local communities, whose economic wellbeing is directly impacted by this performance (Post et al, 2002). This is certainly true for banks, whose key intermediary role in modern capitalistic economies put them at the center of a complex network of legitimate interests and claims. From this derives the importance of the reliability and materiality of the information that banks' financial statements convey to their various users. Recent cases such as the Veneto Banca crack, who costed around 5 billion euros to its shareholders, of which more than 4 just to households (Ganz, 2018), reminds us of the tremendous consequences that opaque reporting on business activities can have. In fact, financial information plays a central role in allowing agents both within and outside the firm to make good allocation decisions: customers can assess if the firm is in the position of continue to support its products, suppliers can decide how much to invest in building specific relationships with the firm, and investors can assess the goodness of the business strategy and what it entails for the future performance of the firm. Ultimately financial reporting constitute a fundamental monitoring tool, allowing stakeholders to assess how well decision-makers within the firm have used the economic resources entrusted to them, and act accordingly. The Veneto Banca example is quite harsh in demonstrating the consequences of choices based on mystified financial reports. Indeed, according to preliminary investigations, some former members of the management purposefully engineered several operations to inflate the price of the shares sold to the public, probably in an attempt to ease the capital increases needed for regulatory compliance (Il Gazzettino, 2017, "Dati falsi a Bankitalia, il pm: «Processate Consoli e Trinca»").

In consideration of the social costs that can stem from poor financial reporting, especially in an industry as sensitive as the banking one, it is interesting to assess to which extent these costs are internalized by the actors who have a primary influence on banks' economic outcomes and, as importantly, on their reporting processes, such as directors and executives. This latter issue should not be underestimated. In fact, on one side managers are monitored and rewarded

according to the performance of the firm that is entrusted to them, but on the other side they are in control of the processes that lead to report on that same performance. There is an important conflict of interest, whereby the agent materially contribute to shape the measure of the performance on which he will be evaluated.

From here arises the interest in assessing the sensitivity of banks' management compensation to indicators of accounting quality, and so the power of shareholder to defend their interest in an unbiased financial reporting. This would allow to assess the actual incentive that those actors have in fairly reporting on the performance of the firm, and the effectiveness of the overall corporate governance structure within the banking industry. However, the investigation of the issue require a brief digression: why, in the first place, do we have a situation like this? Why don't shareholders just manage the firm? And, even in the case where they do not have an interest in managing the firms, why is there a need to monitor the management's performance?

1.2 – The Birth of Modern Business: The Separation of Ownership and Control

In 1932 Berle and Means published their seminal book *The Modern Corporation and Private Property*, in which they highlighted that present-day companies were increasingly characterized by dispersed ownership. Contextually, they put forward the view that "*the separation of ownership from control produces a condition where the interests of owner and of ultimate manager may, and often do, diverge, and where many of the checks which formerly operated to limit the use of power disappear*" (p. 7).

Although the formulation of the problem can be traced back to Adam Smith (Zogning, 2017), Berle and Means where arguably the firsts to tackle the issue of fragmented ownership from the perspective of modern financial markets where "*in place of actual physical properties […] the owner now holds a piece of paper representing a set of rights and expectations with respect to an enterprise*" (p. 64).

At the time, the spread of the figure of the professional manager, based on the increasingly prevalent notion that the conduct of an enterprise should be assigned on the base of technical expertise, and not right of blood (Zogning, 2017), caused the parallel rise of the issue of reconciling the interests misalignment that such a situation created. In investigating the subject, economics theorists elaborated the notion of agency relationship.

1.3 – The Principal-Agent Problem

An agency relationship can be defined as a situation in which a principal delegates to an agent the decision-making power to perform a series of tasks over which the principal's utility depends (Jensen and Mackling, 1976). The principal-agent problem arises from the assumption that agents are self-interested, concerned only with the maximization of their own utility, and as such might exploit the asymmetric information that characterize the agency relationship to take decisions that benefit themselves over the principal (Zogning, 2017).

Although born to describe shareholders-managers relationships, agency theory has since evolved in its application both within economics and across other disciplines, being applied in fields as diverse as sociology, accounting, political science, finance, and law (Zogning, 2017). In relation to the development of the concept within economic science, in their literature review Panda and Leepsa (2017) distinguish between three type of agency problems: principal-agent, principal-principal, and principal-creditor. Principal-agent problems relate to the classic shareholder-management issue, and deal with problems such as the limited duration of the involvement, who cause the agent to focus only on short term cash flows (in contrast to the infinite-horizon concern of equity-holders). Principal-principal problems are concerned with the relationship between majority and minority shareholders, highlighting problems such as earning retention or monopoly of decision power, while principal-creditor problems relate to equity-holders-debtholders relations, for example dealing with conflicting risk preferences (e.g. gambling for resurrection).

In general, the solution of the agency problem involves the incurrence of agency costs. According to Jensen and Mackling (1976) agency costs can be divided between:

- monitoring costs, comprising all cost incurred by the principal to direct, monitor and assess the performance of the agent (e.g. manager pay, BoD costs, reporting expenses);

- bonding costs, related to the cost incurred by the agent to operate according to the will of the principal (e.g. ban on insider trading);

- residual losses, encompassing all the losses suffered by the principal due to the agent's selfish decisions (e.g. empire building).

Solving the agency problem means minimizing these agency costs through the design of an appropriate corporate governance system, in an attempt to reduce information asymmetry and improve interest alignment between principal and agent.

1.4 – The Issue: Does the Quality of the Information Matter?

Focusing on the minimization of information asymmetry, the most evident example of a tool concerned with reaching this aim is given by financial reporting. Enlightening to this regard is IASB's Conceptual Framework for Financial Reporting (2018), that in laying down the objective of general purpose financial reporting asserts that:

"The primary users of general purpose financial reporting are present and potential investors, lenders and other creditors, who [...] need information about the resources of the entity not only to assess an entity's prospects for future net cash inflows but also how effectively and efficiently management has discharged their responsibilities to use the entity's existing resources (i.e., stewardship)"

Moreover, accounting standards have been receptive to the need of integrating financial statements with more granular information about managers' transactions with the firm, as demonstrated by *IAS 24 – Related Party Disclosures*, who mandate to report in detail about Key Management Personnel compensation and other benefits.

However, as noted before, a notable feature of financial reporting is that, if on one hand it is a valuable monitoring and decision-making tool for investors and other stakeholders concerned with the economic performance of the firm, on the other hand this vital monitoring tools is produced by the management itself. This conflict of interest, whereby the agent has the control over the formation of the performance measure upon which he will be assessed, rises the issue of the reliability (or better: quality) of the information provided. This introduces several intriguing questions: How do information recipients deal with quality issues? How do they react to evidence of low quality? How does this relate to agents' payoff? How does this happen within the banking industry?

1.5 – Signals of Accounting Quality: The ECB Comprehensive Assessment

In exploring these issues, this study aims at shedding additional light on the link between corporate governance and financial reporting in the banking industry. In doing this, a key aspect of the research is that it will exploit the exogenous shock provided by the 2014 ECB Comprehensive Assessment. This exercise involved the execution of an Asset Quality Review and two Stress Tests, and was performed by the ECB in view of its enlarged supervisory responsibilities following the implementation of the SSM framework. In the process, the ECB ended up producing several accounting quality indicators. As exemplified by Figure 1, this last point is of particular scientific importance. Indeed, those proxies have the advantage of being
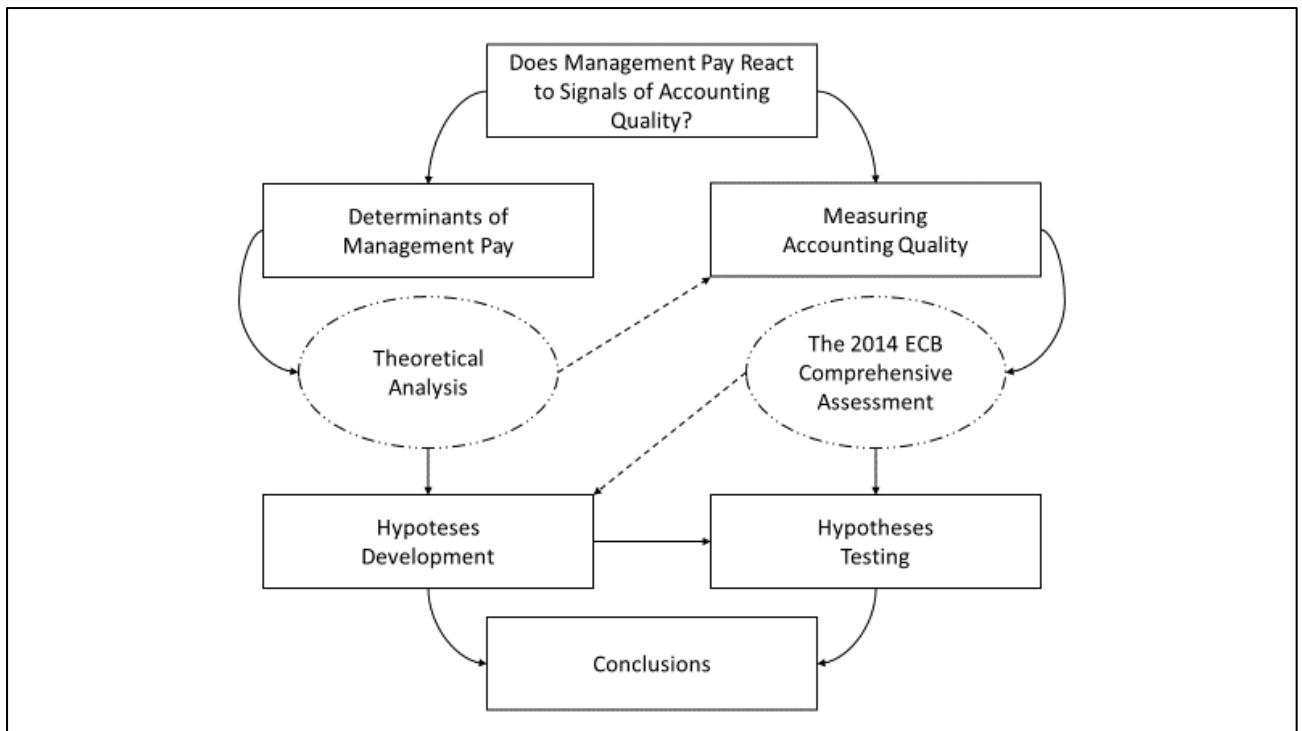
Figure 1 – Thesis Conceptual Framework

specifically produced for each bank by an independent party, and as such constitute a valuable occasion to test if, and to which extent, shareholders react to evidence of poor reporting practices. The exploitation of this measures is a distinctive element of this research, considered that past studies mostly relied on several indirect accounting quality proxies "artificially" built by statistical procedures, whose construct validity and effectiveness have been challenged in the past (Dechow et al, 2010; Beatty and Liao, 2014). Compared to these tools, the accounting quality proxies offered by the CA, by being the result of an analytic and methodologically consistent investigation process specifically tailored to each bank's situation, are an interesting novelty compared to the classical "indirect" measures based on abnormal deviations from an average firm (e.g. abnormal accruals models, earning response coefficient, asymmetric timeliness coefficient, etc.). In addition to this, the results of the CA were specifically meant by the ECB to be directed to investors and made public for each bank. This is another valuable feature: the public nature of the information is ideal in assessing the actual responsiveness of stakeholders to evidence of biased reporting.

1.6 – Preliminary Considerations on Existing Literature

As explained in the literature review offered by Dechow, Ge, and Schrand (2010) the relation between accounting quality (generally intended) and executives' compensation has been

already investigated before, both considering accounting quality as a determinant (e.g. compensation is more sensitive to performance when earnings are more persistent) and a consequence (e.g. stock options increasing the incentive to manage earnings) of compensation policies. However, with regard to the banking literature, the review offered by Beatty e Liao (2014) suggests that accounting quality research in the banking industry has mostly concentrated in manipulations aimed at meeting capital requirements, and the few researches who concentrate on the relationship between accounting quality and compensations focus on accounting quality as a consequence of compensation. In addition to this, and similarly to what we find in non-banking accounting quality research, the proxies used in this stream of literature to identify accounting quality have been criticized on their ability to actually identify the underlying constructs (Beatty and Liao, 2014). In consideration of this, there is a research gap in examining accounting quality as a determinant of management's compensation within the banking literature. Moreover, the specific setting of this research offers a unique and clear way to interpret the findings.

In light of this the question that will guide the development of this thesis can be framed in the following way: does the evidence of a low quality of financial reporting implies a wage penalty for managers in the banking industry? In other words, are shareholders able to effectively penalize top managers once evidence of poor accounting practices emerges?

The answer lies at the intersections of two literatures: the corporate governance literature dealing with executive compensation, and the financial accounting literature investigating the issue of accounting quality.

Chapter 2 – Theoretical Analysis

2.1 – Insights on Executive Compensation

Before examining the rich academic literature investigating management pay, here is proposed a brief discussion of some facts about the topic, to lay down the ground for a deeper analysis. The following subsections discuss some stylized facts about executives compensation, mainly concerning its level and composition. This discussion draws from Frydman and Jenter (2010) and Edmans et al (2017).

The level of pay

If we were to base our opinion on the narratives that characterize the public discourse, we would gain the impression that the history of executive compensation is one of continuous and ineluctable exponential growth, especially if compared to the pay increase that other categories of workers enjoyed. Indeed, as Edmans et al (2017) report, in S&P 500 firms the average CEO-to-worker pay ratio passed from being 40 in 1980 to 335 in 2014. However, this view is only partially true.

To this regard, Frydman and Saka (2010) offer an interesting long-term view on the subject. By gathering data on the three most paid executives in the fifty largest US firms, they are able to supply a valuable overview on the historical evolution of executive compensation, starting in 1936 and ending in 2005. As we can see from Figure 2, executive compensation actually decreased during the Second World War and stayed more or less at the same level until the 70s, slowly recovering. The sharp increase in top management pay is a relatively recent fact that started somewhere in the first half of the 80s, just to skyrocket in the 90s. Moreover, we can observe that most of the increase was not driven by the salary, as one might think, but by bonuses and options. Indeed, options alone played a major role during the 90s sharp growth, but were substituted by bonuses and long-term compensations after 2000.

As we can see from Table 1, this trend didn't affect just the largest firms. In their review, Edmans et al (2017) show that by comparing the median top manager pay across S&P 500, S&P MidCap and S&P SmallCap from 1992 to 2014, there is a clear growth trend across all sizes, although of substantially different magnitudes: 226% for high-caps, 184% for mid-caps and 115% for small-caps. Interestingly, they note that prior to the 70s the distribution was less
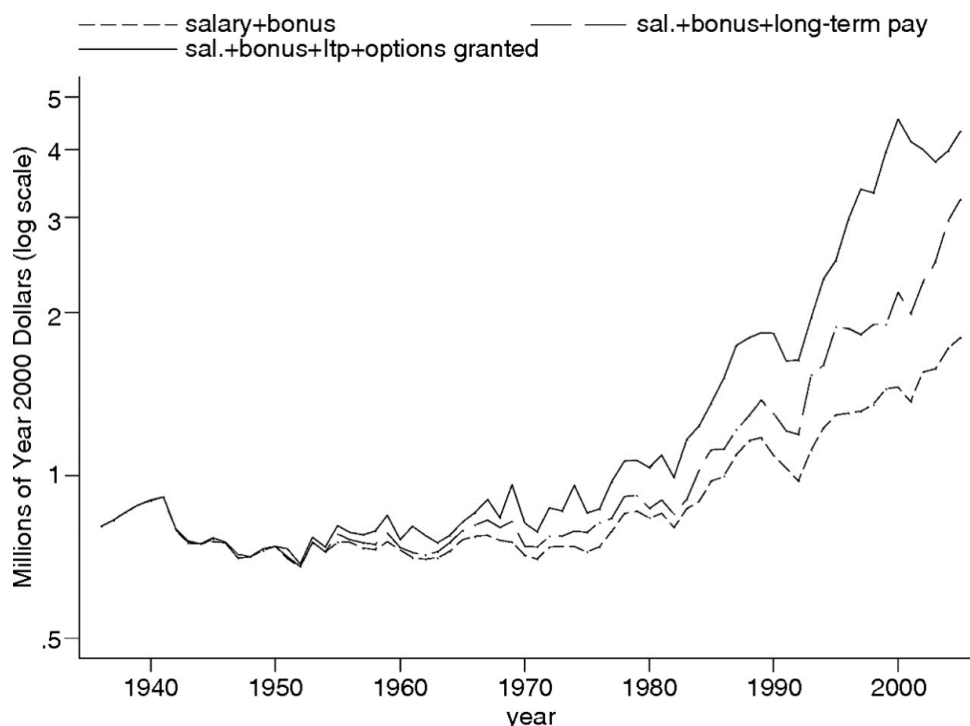
Figure 2: Top manager compensation in large firms 1963-2005 – *Source*: Frydman and Saka (2010)

	S&P500		S&P MidCap		S&P SmallCap	
Year	Median	Mean	Median	Mean	Median	Mean
1992	3.1	4.1				
1993	3.1	4.4				
1994	3.9	5.4	1.9	3.0	1.3	1.9
1995	4.2	5.9	2.0	3.3	1.3	1.8
1996	5.0	8.5	2.3	4.1	1.4	2.1
1997	5.8	10.4	3.0	5.0	1.7	2.7
1998	6.7	13.1	3.0	5.5	1.8	2.7
1999	8.0	14.6	3.2	6.4	1.8	2.8
2000	8.8	20.0	3.5	6.0	2.0	3.0
2001	10.0	16.6	3.5	5.7	1.9	3.1
2002	8.7	12.5	3.9	5.4	1.8	2.8
2003	8.5	11.3	3.4	4.8	1.9	2.5
2004	9.0	12.2	4.0	5.4	2.3	3.1
2005	8.6	12.2	4.0	5.6	2.3	3.4
2006	9.6	13.1	4.0	5.5	2.0	2.8
2007	9.3	12.1	4.5	5.3	2.1	2.8
2008	8.3	11.2	4.1	4.8	1.9	2.8
2009	7.8	9.5	3.9	4.9	1.9	2.4
2010	9.3	11.1	4.7	5.6	2.3	2.7
2011	9.4	11.7	4.7	5.6	2.4	2.9
2012	9.4	11.0	4.7	5.5	2.4	3.0
2013	9.9	11.8	5.0	5.7	2.6	3.3
2014	10.1	12.0	5.4	6.4	2.8	3.3

Table 1: CEO Compensation Levels from 1992 to 2014 in million – *Source:* Edmans (2017)

dispersed. The skewness began with the growth of the 80s and started to decline after 2001, mainly because large-cap CEOs compensations remained fairly constant while others continued to grow.

Beyond this generalized rise in pay, by analyzing those data they come to three interesting conclusions. First, that the mean pay increase was appreciably larger that the median pay increase during the 90s. This trend reverted gradually at the beginning of the new century, probably due to the burst of the dot-com bubble. In any case, the skewness of the pay distribution has important implications for representing the data: the mean is more important in representing aggregate data, but due to few highly paid executives the median is more representative of the typical CEO. Moreover, the effect of these outliers must be carefully considered in cross-sectional analysis. Second, there are noticeable differences in the evolution of the pay across large-cap, mid-cap, and small-cap. The premium to manage a large-cap in comparison to a medium-cap was 105% in 1994, peaked to 186% in 2001 and fall to 87% in 2014. Comparing premium to run a mid-cap in respect to a small-cap, those differentials are substantially lower: 46%, 84%, and 93%. Third, by crossing the data of CEOs compensations with the data on compensations of other top managers, they note that while the premium between CEOs differs noticeably by firm size, the wage differential between CEOs and top managers of firms of similar dimension is fairly similar across sizes (average ratio of 2,2).

The structure of pay

After having analyzed the evolution of pay levels, we turn to the problem of examining its structure. Indeed, even if the level of managerial pay is a rightful concern for both academic and practitioners, it is its composition the true milestone of modern corporate governance and business economics. More specifically, we noted before that proponents of the agency theory (Jensen and Meckling, 1976) argue that, given the separation between property and control and the substantial information asymmetry between agent and principal, it is necessary to design a contract capable of minimizing the risk of moral hazard. Economic theory assumes that agents are rational and self-interested, and so the only way that the principal has to induce the agent to maximize his utility is by aligning their interests. In practical terms, the lever often used to incentivize executives to maximize the firm's value is the engineering of the structure of their compensation contracts. For example, shareholders could use stock grants to induce managers

to increase firm value, option grants to favor risk-taking, or corporate bonds to increase debtholders confidence and reduce the cost of debt.

The asymmetric information problem derives exactly from the principal's inability to perfectly observe the agent's actions. That's why the assessment of the agent behavior is done by observing some proxy of his level of effort. However, given the risk averse nature of the agent and the noisy nature of the performance proxies (i.e. the performance indicator is affected also by variables outside the agent's control), it is would be suboptimal (i.e. too costly) to design a completely variable compensation contract. That's why we usually observe that those contracts tend to have, beyond the fixed salary, incentive plans either based on earnings or equity, depending on whether they grant a participation in firm's earnings or the grant of equity instruments (usually share or options). Both earning- and equity-based bonus plans are generally linked to a variety of performance measures that range from accounting ratios (e.g. ROIC), to market indicators (e.g. value added), to non-financial performance measures (e.g. CSR goals). Moreover, to mitigate short-termism issues, equity instruments tend to be granted in restricted form, which means that certain conditions (usually related to time or performance) must be satisfied before they can be transferred.[1]

To analyze the historical evolution of executive pay structure, Edmans (2017) use the data supplied by Frydman and Saks (2010) and divide the annual payouts between salary and bonuses, long term incentive plans and stocks, and option grants. The results are presented in Figure 3. As we can see, until the 50s the most important parts of executives' pay were salary and performance-related bonuses. In the 60s long term incentive performance started to emerge, although we must wait the 70s for them to become noticeable. However, the most interesting result is the steady growth of option compensation, that despite emerging together with LTIPs, quickly ended up surpassing them. By the 90s they became a primary part of CEOs pay, and so remained until the first years of the XXIth century.

Figure 3 is based on a relatively small sample. To gain a better understating of the phenomenon Edmans et al (2017), using the whole S&P 500, plotted a more granular segmentation of CEOs compensation by distinguishing between salary, bonuses and LTIPs, stock grants, option grants, and a residual category (Figure 4). This plot widen our perspective, and if from one side confirms the primary role played by option grants during the 90s, it also demonstrates that in the years following the dot-com bubble the importance of options started to fade away. More

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[1] It must be noted that this is just one view on the formation of compensation structure. In first approximation, it can be safely assumed to be the main driver. However, empirical evidence suggests that also other external incentives play a tangible role, such as regulation or taxes. This issue is expanded in section 2.1.1.

specifically, we can observe that while the salary component and the bonuses stayed almost put, there have been a clear substitution of options with stock grants. Besides, they replicate the exercise even for mid- and small-cap firms and discover similar patterns.
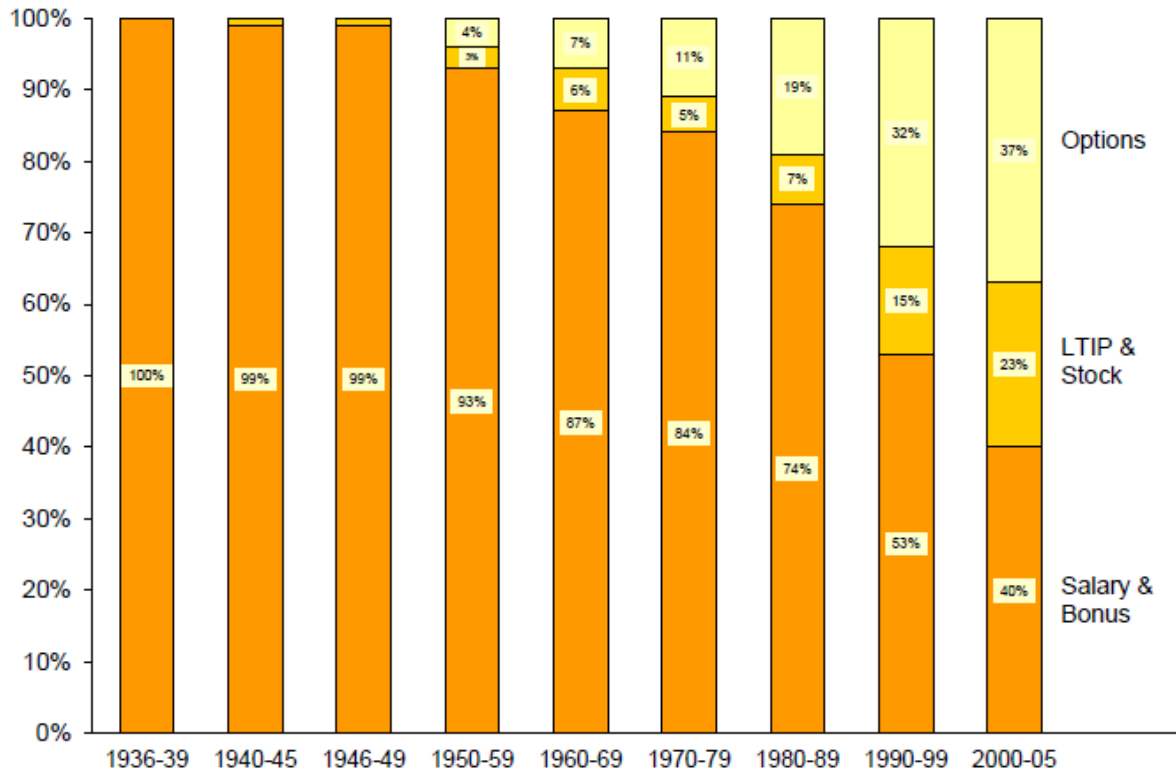

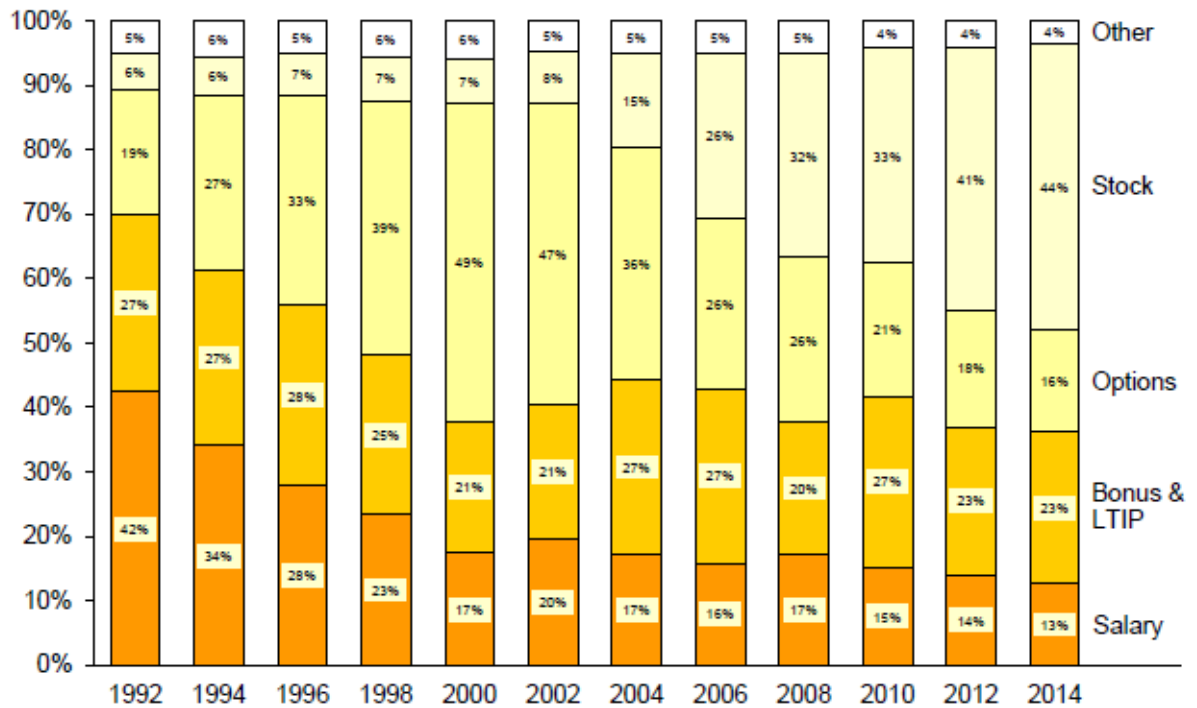**Figure 3**: Structure of CEOs pay in top 50 largest firms 1963-2005 – *Source*: Edmans et al (2017)

Figure 4: S&P500 CEOs Pay Structure – *Source*: Edmans et al (2017)

Edmans et al (2017) note an interesting particular in relation to the stock grants rise that took place after the 2001 market crash. They observe that those new bonus plans replaced the old time-vesting stocks (i.e. at the end of the period, if the executive is still in the firm, he receives a certain number of stocks) with the so called "performance-based equity": grants for which the number of shares vested is linked with one or more performance measure. This form of compensation is used also for options, and presents itself in two varieties. In the first one, a fixed number of stocks is awarded if after a certain period the executive is still with the firm *and* certain conditions have been fulfilled (usually performance targets). In the second case, after a certain period a variable number of stocks is awarded to the manager as a (usually non-linear) function of a certain performance variables. According to the authors, this shift in compensation practices has some shortcomings. Firstly, the structure of these plans makes them extremely difficult to price: Bettis et al (2016) compare the disclosed estimates of the grant-date fair value of a sample of these plans with their own estimates and discover noticeable discrepancies. The complexity of attaching a reliable fair value to these pay components creates serious valuation problems for board members, shareholders and other stakeholders, difficulty that may hinder their ability to assess executives' true cost (rising concerns about stealth rent extraction). Secondly, given the non-linearity of the payoff profile, it is difficult to assess the actual incentives created by these new forms of equity bonuses, and their effects on managers' behavior.

The value of pay to executives

The past discussion on the level and structure of managers' compensation was centered on the shareholders' perspective. In other words, the discussion viewed executive pay from the cost-driven perspective of the firm. This is a legitimate view; however it is important noting that the value of the compensation to the executive might be different from the value implied by the firm perspective. Firms' compensation costs are mainly related to the value assigned by financial investors to those compensations: they are fair market prices. Nevertheless, we must consider that managers are not perfectly diversified as financial investors, but indeed have a substantial amount of their human capital invested in the firm. Not only: the receive a performance-linked pay and often hold substantial stakes of company stocks and options. The natural consequence of this is that executives end up with a substantial amount of their wealth invested within the same firm (i.e. an undiversified portfolio). Those highly correlated investments lead (rational) risk-averse managers to place a substantially lower value on their compensation than market prices would suggest.

In practical terms those discounts can be substantial: Hall and Murphy (2002) find that, under reasonable assumptions about managers' risk aversion, the discount for a typical at-the-money option with 10 years life range between 40% and 60%. Of course, the discount depends on the compensation instrument: the more it is correlated with the fundamental value of the firm, the bigger the discount. In this sense, options will be discounted more than share, that will be discounted more than earning-based bonuses. This is important, because it implies that compensation packages with the same dollar value, but a different composition, would give substantially different utility to a manager. For example, during the 90s the dollar value of CEOs compensation increased sharply thanks to stock-options, but probably the increase in their utility has been more modest. On the contrary, after 2000 large-cap CEOs compensation increased a lower rate (see Table 1), but the structure of the compensation presented a decrease in the importance of option contracts and a contextual increase in stock grants, probably leading to increases in executives' utility larger than the examination of plain fair values might suggest (options tend to have higher volatility than the underlying equity instruments).

2.1.1 – Determinants of Executive Compensation

To justify the observed level and structure of executive compensation three non-mutually exclusive perspectives can be adopted: the shareholder value view, the rent extraction view, and the institutional influences view.

The Shareholder Value View

In explaining the observed level and composition of executive pay, the Shareholder Value Theory views those variables as the outcome of an efficient market-driven process, in which firms compete for managerial talent and design optimal contracts to solve agency problems, with the ultimate aim of maximizing shareholder value.

For what concern the level of pay, the shareholder value theory sees compensation as the outcome of a contracting process in which firms try to maximize the net value creation derived from hiring a manager, while the manager contextually tries to maximize his utility by trading-off compensation with effort (Edmans et al, 2017). Those are basically labor market models, in which what matter for the firm is the CEO's contribution to value in respect to other CEOs in the market, and for the CEO is how the employment opportunity offered by other businesses compare to that of the firm. From this follows that, according to this market-driven view, the possible drivers of the observed increase in executive pay in the recent decades are

fundamentally three (Edmans et al, 2017), all related to shifts in opportunity costs. First, there might have been less and less valuable outside options for firm's looking for a CEO (e.g. increase in differences between CEOs' abilities), which resulted in them being able to command higher remunerations. Second, the outside options for CEOs have improved (e.g. more transferable human capital), which resulted in bidding up their pay. Third, CEOs' started to derive less and less utility from the optimal contracts, because of increased risk and/or effort levels, who was offset by an increase in contracts' monetary value.

If the level of pay can be seen as mainly driven by external market forces, the structure of CEOs' compensation just reflects an inherent characteristic of modern businesses: the separation between property and control and the subsequent need for interest alignment. From the shareholder value perspective, the structuring of CEOs compensation is completely functional to the minimization of agency costs by making executive payoff (or better: wealth) sensitive to firm value, in this way directing effort. But how to explain the variety (and variation) of executive bonus plans? Edmans et al (2017) point out to several alternative explanations for the composition of those incentive plans, each grounded in evidence and consistent with the value maximization view. For example, mixing stock and options is optimal to incentivize efficient risk taking (Dittmann et al, 2017), while debt grants can reduce the cost of debt and increase shareholder value (Edmans and Liu, 2010). In this way, changes in pay structure may reflect changes in interest-alignment objectives and financial innovation.

The Rent Extraction View

Contrary to the shareholder value perspective, the rent extraction theory views the determination of the level and structure of pay as the outcome of a process in which the executives themselves decide the amount of compensation they receive, maximizing extraction while contextually trying to do not draw excessive attention from the (in this case oblivious) shareholders (i.e. respecting an "outrage constraint"). This view is predicated on the ground that the two mechanism that should prevent this from happening, the Board of Directors and the market forces (equity capital market, managerial labor market, etc.), are far from perfect. On one hand, it is argued that it exists an agency problem also toward directors, who consequently are usually viewed as accommodating, or at best as ill-informed. On the other hand, the control exercised from market forces can be loose under certain conditions (private firms, little need for financing, poor disclosure, frictions in the labor market), allowing considerable room for value-destroying rent extraction. Note that the possible negative consequences from this situation go well beyond the value drain resulting from pay, but are

mostly related with the poor business choices that result from the executive misguided behavior or insufficient effort, stemming from the lack of interest alignment (e.g. empire building, pet projects).

Under this framework the drivers of compensation level can be various. Kuhnen and Zwiebel (2009) show that pay extraction is increasing in production uncertainty (it is easier to blame bad luck) and outside options (the cost of firing is lower). Acharya and Volpin (2010) and Dicks (2012) show that rent extraction in one firm can impose negative externalities on other firms, through managerial labor markets (increased reference wage). This suggest that rent extraction do not need to be endemic to inflate managers' pay. Moreover, several corporate governance issues tend to be associated with rent extraction. Ineffective boards (high size, CEO as chairman, outsiders appointed by CEO) are associated with pay practices that favor the CEO (Armstrong et al, 2012). A similar effect is found for anti-takeover provisions (Borokhvich et al, 1997).

For what concern the pay's composition, according to this view its role is not to mitigate moral hazard, but (ironically) to allow the extraction of "hidden compensation". As Bebchuk and Fried (2004) point out, the ability to extract rent is constrained by the possible outrage of shareholders (or other stakeholders). That's why, according to the rent extraction view, the structure of executive compensation is conceived to obscure the actual level of compensation, so that to maximize rent extraction. This can be done by using bonus plans whose fair value is difficult to estimate. This could explain the rise in options grants during the 90s, if we follow the view of Hall and Murphy (2002) who argue that shareholders and directors tend to underestimate the true cost of option compensation. This is consistent with them being misled by the favorable accounting treatment in force until 2004 in the US. Similar concerns can rise in relation to recent diffusion of performance-based equity grants.

The Institutional Influences View

Finally, the last possible explanation is supplied by the institutional influences theory. This theory argues that institutional influences are important in shaping the level and structure of executive compensation. Some examples of these influences are legislation and taxes, accounting rules, compensation consultants and proxy advisors.

Legislation can influence directly management pay by banning certain practices (e.g. executive options were illegal in some countries during the 90s). For what concern taxes, an example is offered by the US in 1993, when the Clinton Administration posed some limits on the tax

deductibility of some form of compensation for public firms executives. According to Perry and Zenner (2001) this had relevant effects in shaping both the level and the composition of pay, contributing to the shift toward equity-based rewards (those categories were not interested by the reform). Another example is offered by Smith and Watts (1982), who offer evidence that bonus plans are used to minimize the tax liabilities of executives and firm.

For accounting, an example is given by the favorable treatment of options granted by US GAAP until 2004, who allowed to not charge at-the-money or out-of-money options. According to Murphy (2013) this leads directors to concentrate on the number of options, instead that on their (growing) fair value.

Beyond external factors, it has been documented that also compensation consultants and proxy advisors seem to influence compensation policies, although in an unclear way. Armstrong et al (2012) show that compensation consultants are associated with higher pays, however this effect disappear once we control for corporate governance. Similarly, while Larcker et al (2015) say that firms that follow proxy advisors recommendations are met with negative market reactions, suggesting poor advices, Ertimur et al (2013) argue that proxy advisors actually try their best to fit their recommendations with the business situation. To conclude, it is worth noting that the institutional influences theory is mainly concerned with explaining executive pay composition, rather that its level.

Overall, all these theories offer explanations that are consistent with the empirical regularities described in section 2.1. Indeed, as Edmans et al (2017) point out, those views are not mutually exclusive. It is likely that to some extent all contribute to define management pay. For example, executives might try to extract rent, but when discovered are disciplined by shareholders, who also takes into account the external environment to shape more convenient remuneration policies. To clarify the issue, we note that further insights on the prevalence of one explanation over another can be gained by the examination of the actual consequences of remuneration policies.

2.1.2 – Effects of Executive Compensation

Much of the debate on executive compensation is concerned with its level and composition, hence with its determinants. However, just as interesting are the issues concerning its effects. For example, for investors it might be valuable to assess the desirability of one form of compensation over another, while for regulators the opportunity for policy intervention in case of undesirable market outcomes, such as an equilibrium wage in managers labor markets

beyond the efficiency level. From a normative perspective, those effects are of utmost relevance. In consideration of this, here is presented an overview of the consequences that different compensation policies can have on selected firm's attributes: value, performance, intertemporal decision-making, and risk taking.

Firm Value and Profitability

Given the incentivizing role that compensation arrangements are intended to play, we would expect to observe a positive association between some of their features and firm value (particularly for equity incentives). Indeed, there is a substantial amount of research on the issue, however the results are mixed.

In an early study, Morck et al (1988) find that the relationship between firm value and management ownership is initially positive (as predicted by the shareholder value view) but then at a certain point turns negative. They explain this fact as due to the increasing entrenchment of management. Some of the following studies find evidence in accordance, adding new insights: McConnell and Servaes (1990) argue that the critical limit for insider ownership is between 40% and 50%, while Kim and Lu (2011) argue that this non-linear relationship hold only in presence of weak external governance (i.e. market forces that tend to discipline management, like industry competition) and become insignificant once external governance is high enough.

However, some other scholars fail to find any significant relationship between equity ownership and firm value (Agrawal and Knoeber, 1996; Demsetz and Villalonga, 2001). The issue remains unsettled, given the difficulty in establishing causal effects when studying these phenomena.

For what concern profitability, early studies showed that introduction of LTIPs based on accounting metrics have led to an increase in profitability (Kumar and Sopariwala, 1992). In regard to equity incentives, evidence suggest that they can boost operating performance (Core and Larcker, 2002).

Short-termism and Risk Taking

Short-termism can be defined as the practice of inflating current performance at the expense of long-term value creation. It is a form of gaming of the incentive system, a risk inherent in any performance measurement and control system that ties rewards to performance metrics. In principle, we can distinguish between two form of short-termism: one that is based on the

gaming of the measurement systems (e.g. earning management through accounting policies) and another that is based on the manipulation of the underlying performance (e.g. cut in maintenance expenses, a form of real earning management). The discussion of the first form will be done in the part of the literature analysis dedicated to accounting quality. For what concern the second form, some authors have observed that the incentives to short-termism are higher when grants vest, because management wealth is more sensitive to short-term performance. Using this result, Bizjak et al (2015) show that executives engage in real earning management when earning-based grants expires. Ladika and Sauter (2016) find similar outcomes, and specifically observe a fall in R&D and capital expenditure, with a contextual rise and subsequent fall in stock prices, consistent with stock prices manipulation. This suggests that short-termism is an actual concern when adopting incentivizing compensation packages.

Going forward, there exists evidence that compensation structure influences the risk-taking behavior of managers. Coles et al (2006) find that the higher sensitivity of CEO's wealth to volatility induced by option compensation can influence the incentive to adopt riskier corporate policies in term of higher R&D investments, higher leverage, and more business focus. This demonstrate that a wise design of compensation structure can help to avoid short-termism and incentivize value-creating risk taking.

Overall, it seems that the effects of compensation policies point in the direction of the increase in shareholder value, with positive effects in term of value creation, profitability and risk taking. Nevertheless, there is also evidence that a faulty design of compensation policies can lead value-destroying outcomes more consistent with the rent extraction view, in the form of management entrenchment and short-termism. Although firms, when designing compensation contracts as part of their corporate governance system, clearly seem to do it in the pursuit of the maximization of shareholder value, it is clear that perverse effects are a real possibility.

To determine which explanation is more relevant for the issue at stake, it is necessary to deepen the examination of the relationship between executive compensation and accounting quality.

2.2 – Financial Reporting, Agency and Accounting Quality

With the spread of the separation between ownership and control, the subsequent emergence of the agency relationship between professional managers and shareholders prompted the need to endow investors with adequate tools to monitor and direct agents' actions. To this regard, financial reporting became an important component of the corporate governance structure of each firm. By its very nature, financial reporting aims at representing the economic and

financial performance of the business, supplying information about the resources owned and used by the enterprise. Considered the interests of equity investors in economic performance, the use of the accounting system as a mean of interest alignment is straightforward: this supplies at the same time metrics on which performance can be assessed and monitoring tools to inform on the employment of economic resources by executives.

However, an important thing to realize is that the management, comprising both directors and corporate officers, do not exert a control only on the firm whose performance is into question, but also on the performance measurement system itself. This creates a conflict of interest, whereby managers might have an interest in gaming the performance control system by acting on the performance measurement instead that on the performance itself. The incentive that managers have to mystify the corporate performance rise the issue of accounting quality. For this reason, it is imperative to invest a little time on eviscerating the concept. In other words, what really is accounting quality? A sound conceptualization of this apparently obvious notion is necessary to make sense of the discussion that follows.

In tackling the problem, one might simply be tempted to assume that accounting quality is a synonym of fair representation of the "true" financial and economic situation of the firm. From this preliminary stance would follow that bad accounting is the one that leads us astray from appreciating the real performance of the business. Take for example the case of the CEO who overestimates the size of the CGUs to manipulate the result of an impairment test, maybe in an attempt to avoid reporting a considerable impairment loss on the goodwill resulting from a bad acquisition. According to the latter view, this would be considered an accounting quality problem, on the ground that it misrepresents the true loss stemming from the bad business move. However, a little reasoning on foundational financial accounting concepts makes it evident that this conception is naïve. Indeed, one must consider that accounting policies always imply a choice in term of the relevance-reliability trade-off and consequently a choice in term of which users to favor. As an example, banks might appreciate the reliability and low discretion of an accounting system leaning toward the historical-cost approach, while on the contrary investors might find more useful a report based on fair values, containing more value-relevant information. In reference to the aforementioned example of the goodwill, banks would prefer it to be amortized (at the risk of not representing the true value of the acquisition), while investors would welcome more favorably the use of impairment tests (at the risk of being fooled by discretionary estimates). Considered that both approaches have shortcomings, what constitutes "quality accounting" reveals to be more puzzling than expected.

In light of these considerations, the next step in trying to address this dilemma could be to look at the academic works on the field, to see how accounting quality is defined and measured by scholars tackling the issue. Unfortunately, as Dichev et al (2013, p. 2) note "*the concept of earnings quality is fundamental in accounting and financial economics. Yet, there are broad disagreements about how to define and measure it*"[2]. This view has been challenged by Nelson and Skinner (2013), who argue that this does not necessarily imply a disagreement between scholars, but simply the use of the same term to identify different but related constructs. This is a valid observation, however from our perspective the problem of assigning a workable meaning to this expression persists.

To solve the problem, I decided to adopt the perspective of Dechow, Ge, and Schrand (2010) who defined accounting quality in the following way (p. 344):

"*Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker*"

This definition has the advantage of being broad and general, without being too abstract. Indeed, it is still enough precise to give us a good understanding of what accounting quality is. Those characteristics serve the purpose of supplying a concept useful to make sense of a vast amount of literature, enabling a deep and flexible analysis of the topic.

Before proceeding, a final remark is due. As can be inferred by the previous discussion, the concept of earnings quality is operationalized through a vast amount of proxies. A detailed discussion of these proxies is beyond the intent of this thesis.[3] However, it must be kept in mind that each of these proxies aims at measuring a different facet of the accounting quality construct. From this follows that every discussion about accounting quality cannot prescind from a clear definition of what quality means in that context, and from a conceptual analysis of the consistency between that facet of the construct and the proxy used to grasp it.

2.2.1 – Accounting Quality and Executive Compensation

Of particular interest for the issue at stake is how accounting quality relates to executive compensation. To this regard, evidence suggests that management pay structure is an important factor in determining earnings quality. In relation to equity incentives, Baker et al (2003) find

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[2] From now on, accounting quality and earnings quality will be used interchangeably to indicate the same construct.

[3] Interested readers can refer to Dechow et al (1995) and Dechow et al (2010) for an overview of the proxies used in scholarly work. Those more oriented toward applications can refer to Penmann (2013).

that stock-option based compensation is associated with negative discretionary accruals in periods prior to option award date, while Efendi et al (2007) show that the likelihood of a restatement increases as the CEO has a great deal of in-the-money stock options. In addition, McVay et al (2006) find that managers that hold stocks tend to engage in target beating to profit from favorable price changes. For what concern earning-based compensation, Healy (1985) find that executives use earning management to maximize their short-term compensation. Moreover, Guidry et al (1999) show that the tendency of manipulating accrual to maximize the earning component of compensation is present also at the business unit level.

In relation to the application of fair value accounting, a major concern relates to the discretion that it affords to managers, and consequently the increased risk of opportunistic application of accounting rules (Kabir and Rahman, 2016). To this regard, Shalev et al (2013) offer evidence for what concern the opportunistic application of Purchase Price Allocation. Under fair value accounting, the goodwill resulting from a business combination is not amortized, but subject to impairment test. In consideration of this, according to the authors managers have an incentive in allocating as much purchase price as possible to goodwill: by avoiding systemic amortization and using discretion to delay impairment losses, they are able to increase post-acquisition earnings. Consistently with their view, they find that CEOs who receive a higher share of their compensation as earning-based bonus are more likely to over-allocate purchase price to goodwill. Similar results are obtained by Bugeja and Loyeung (2015), who also document an increase in the share of the purchase price allocated to goodwill after Australia adopted IAS/IFRS. Nevertheless, a reassuring result is offered by Kabir and Rahman (2016), who document that stronger corporate governance increase the link between goodwill impairment loss and economic factors, thereby lowering the benefit of the aforementioned strategy.

It is worth noting that not all authors agree on the existence of adverse effects of compensation policies on earnings quality. For example, Dechow et al (1996) do not find an association between the presence of earning-based compensation and accounting manipulation, while Armstrong et al (2010) report a similar result for stock-based incentives.

Overall the evidence seems to point in the direction of an important influence of compensation policies on accounting quality, mostly negative.

Changing perspective and seeing accounting quality as the independent variable, research demonstrates that it has substantial effects on one important feature of executive compensation: it tend to increase management pay-for-performance sensitivity (Nwaeze et al, 2006). Moreover, evidence suggests that low accounting quality related to accounting misstatements (Desai et al, 2006) and auditors resignations (Menon and Williams, 2008) results in

management turnover. However, we should bear in mind that those are extreme cases of low accounting quality. It is not clear whether less severe cases would lead to similar results.

Nevertheless, this offer indirect evidence in favor of the shareholder value view: higher accounting quality results in better interest alignment, and executives are penalized when signals of poor accounting quality emerge. This is relevant: even if compensation policies might encourage manager to lower accounting quality (thing more consistent with the rent extraction view), evidence demonstrates that those manipulations are sanctioned when discovered. Again, both theories confirm to be necessary in order to grasp the actual behavior of the phenomenon.

2.3 – The Specificity of the Banking Industry

The previous discussions of executive compensation and accounting quality tackled the issues from a general perspective. However, the main focus of the thesis concern their relationship within the banking industry, and this matter. In fact, the specificities of the banking industry make banks a separate field of research (Lobo, 2017). This derives from fundamental differences in the economics of banks in respect to other firms. On the one side, as any other firm a bank must attract funding from investors, set up a functioning organizational structure to coordinate internal resources, respect regulations, design and market its product and services, face competition of other banks, and ultimately legitimize its existence by making a profit. This is the basic input-transformation-output process that is followed by any organization, in any sector. However, a more detailed analysis reveals that the nature of banking is rather unique. This is linked with the fundamental equivalence between the input and the output of the banking transformation process: debt. Debt is both the raw material and the primary product of the banking industry, and that's what shape its fundamental intermediary role in market economies: the allocation of scarce capital. As a matter of fact, the uniqueness of banks derives from a singular feature of debt markets: the endemic presence of information asymmetries. This in turn is key in justifying the existence of delegated monitoring, according to which banks' primary role is to reduce asymmetric information between savers and borrowers thanks to their superior screening, monitoring, and enforcement abilities.

This translates into four characteristics that motivate the separate study of banks (Lobo, 2017).

First, banks have substantially higher degrees of leverage in comparison to firms in other sectors. Hanson et al (2015) report data concerning the aggregate balance sheet of US commercial banks: the average bank capital structure is composed for 88,6% by liabilities (75,6% deposits + 13% other debts). If we consider that these data range from 85,1% (73,6%

for deposits) at the 10th percentile to 91,8% (88,9% for deposits) at the 90th percentile, and that over US history deposits averaged 80% of assets, we understand that this is certainly an immanent feature for banks. This derives from the primary role of banks in supplying socially valuable liquid claims (DeAngelo and Stulz, 2015), as well as other leverage-related distortions (taxes, moral hazard, etc.).

Second, banks' governance is found to be different than manufacturing and service firms'. Kroszner and Strahan (2001) report that banks' board are larger and with a lower fraction of insiders. More recent work suggests that the independence problem has since been solved, however the size anomaly with respect to non-financial firms persists (Adams, 2011). This might be explained by the greater organizational complexity of banks (Adams and Mehran, 2011) as well as by their greater opacity (Becht et al, 2011).

Third, banks operate within a highly uncertain business environment. As exemplified by Becht et al (2011, p. 445): "*Banks are in the business of taking risks; they can take on risk quickly and easily; they can mask, to some extent, how much risk they take. Their portfolios are often illiquid and hard-to-value, their positions shift rapidly, and their assets and liabilities can be extremely complex*". The complexity of their product and services make it difficult to understand bank prospects to all stakeholders involved (from here the aforementioned opacity and consequent governance features).

Fourth, banks are highly regulated. Those regulations impose capital limits (and thus create incentive for capital management, to avoid reducing the leverage to a level unfavorable to equity investors), reduce the scope of activities (e.g. insurance), impose specific accounting practices and other disclosure requirements, and provide deposits insurances and guarantees (which in turn modify banks' risk-taking incentives). According to Lobo (2017), the homogeneity of operating models and accounting practices implied by a pervasive regulatory framework is particularly useful from a scientific viewpoint, because facilitate the control of possibly unobservable different characteristics between the sample. However it is also problematic because, by their very nature of being applied to all banks, regulations tend to reduce the variability in the data necessary for sound inferences.

2.3.1 – Executive Compensation in Banking Literature

Here is presented that strain of the executive compensation literature that specifically focuses on banks. After having analyzed the literature, it has been deemed appropriate do divide the presentation between pre- and post-financial crisis research. This is due to the fact that, after

the 2007-2009 financial crisis, a great deal of attention was drawn to the (supposedly) excessive risk-taking in banks, and the compensation literature heavily refocused on examining how compensation policies might have influenced this.

Pre-financial crisis research

Before the Great Recession, research examining management pay in banks was quite heterogeneous, and followed the other trends within corporate governance research.

In the wake of the 90s interest on pay-performance sensitivity, an early empirical study by Barro and Barro (1990) examined the association between CEOs pays and turnover with several measures of performance. They found that compensation grew in line with both stock returns and earnings, while turnover probability was influenced only by stock returns. They explained the lack of significance of earning performance in explaining turnover as due to the greater incentive that poorly performing CEOs have in manipulating accounts. Another study by Magnan and St-Onge (1997) examined how the relationship between banks' performance and CEO pay is influenced by managerial discretion (i.e. width of actionable strategic domain), and discovered that the positive association between executive compensation and performance increased with managerial discretion. A deeper analysis of pay-performance sensitivity in the banking industry is offered by Kose and Yiming (2003), who apply the Jensen and Murphy (1990) statistics to investigate several specificities of banks. In their study, they find that banks' pay-performance sensitivity is significantly lower than manufacturing firms. However, they ascribe this fact not to a flaw in compensation contracts, but to the defining features of the industry: its high leverage and its strong regulation. On one side, they argue that a lower alignment of management with shareholder is used to reduce the incentive to shift risk on debtors (depositors), thereby lowering the cost of debt. Moreover, they claim that the lower sensitivity of banks is also due to the strict regulation, that act as a monitoring tool and as such reduce the need to incentive-alignment (acting as a substitute). These findings, suggesting shareholder-management interest alignment, contrast with a research by Bliss and Rosen (2001), who finds evidence that banks' CEOs engage in empire building through mergers with the sole aim of inflating compensation, even when the merger reveals to be detrimental to bank operating performance.

It is worth noting that some scholars tackled the issue of risk-taking before the onset of the crisis. Houston and James (1995) were the first to examine bank executives' pay composition in relation to risk-taking and, perhaps surprisingly, found that bank managers were not provided

with relevant risk-taking incentives. However, a follow-up study by Chen et al (2006) challenged this view. In examining the compensation policies of some banks between 1992 and 2000, the authors discovered that in the banking industry stock-options propagated even more than within industrial firms, and showed that this encouraged risk-taking in banks.

Post-financial crisis research

After the 2007-2009 financial crisis, the scholars' attention focused heavily on the role that compensation policies might have had in encouraging banks' excessive risk-taking.

To this regard, some studies indeed indicate that management bonuses have played a role in increasing the risk profile of banks. Minhat and Abdullah (2016) examine the relationship between stock option compensation and bank risk in UK banks before the crisis, and find evidence of a positive association between bankers' incentives (proxied by options vega) and banks' total risk and insolvency risk. In another study Uhde (2016) investigates the impact of excess variable compensation on banks' risk (z-score) across several European banks, and find evidence that both cash- and equity-based excessive variable compensation increase banks' risk. For what concern the US, Baghat and Bolton (2014) examine the pre-crisis executives' compensation structure of the 14 biggest US banks', and find evidence in support of the adverse influence of pay incentives on banks' risk.

However, this notion is challenged by several studies. Acrey et al (2011) examine the relationship between CEO compensation (short- and long-term) and numerous risk indicators, and find only limited evidence of perverse incentives deriving from compensation structure. Fahlenbrach and Stulz (2011) argue that lack of interest alignment cannot be blamed for the crisis. They show that banks whose management interest was better aligned with shareholders (in term of CEOs' dollar stake) performed worse during the financial crisis, and that neither options nor cash bonuses were significantly associated with lower performance. In addition, they examine CEOs' holding of shares during the crisis, and discover no selling effort before the onset of the crisis, resulting in substantial wealth losses for them. This suggests that bankers took risk in good faith, on the belief they would increase firm value. This also explains the worse performance of banks with better interest alignment. A recent study of Shah et al (2017) find similar results.

To conclude, it is worth mentioning an interesting paper from Chen et al (2014) that examines the relationship between earnings growth pressure, CEO compensation, and bank loan quality. As they note, most commenters asserted that the perverse game between earning growth

pressure and CEOs incentives had played a pivotal role in leading to the subprime crisis. Indeed, they find evidence that long term growth pressure played an important role in lowering loans quality. However, contrary to expectations, they discover that not only there isn't a negative relationship between CEOs' cash and equity bonuses and loans default, but those incentives helped to mitigate the adverse effects of growth pressure on loans quality.

2.3.2 – Accounting Quality in Banking Literature

According to some authors, banks are fundamentally opaquer than manufacturing and service firms (Morgan, 2002; Flannery et al, 2013). This lack of transparency stems from the fact that the formation of their assets and liabilities derives from a substantial use of private information, that in turn makes it difficult for external stakeholder to assess banks' performance (Bushman, 2014). If we consider that accounting information form the basis for the calculation of regulatory capital in most jurisdictions, and its role in preventing systemic crisis, it is clear why this opaqueness is seen as problematic.

However, according to Bushman (2014), it is not clear whether transparency is itself desirable or not. He argues that, for what concern the positive effects, transparency allows to design interest-aligning incentive contracts and discipline executives, to exert an effective market control on risk-taking behavior, to reduce panic and contagion by reassuring depositors, and to reduce financing frictions and ease capital rise during negative shocks. On the negative side, transparency has been indicated to be a possible cause of bank runs, reputational contagion, inefficient investment decision, limited interbank risk-sharing agreements, and reduced banks' ability to produce private money. Overall, contrary to what intuition suggests, there are clear trade-offs between different dimensions of transparency, that should be considered when making decision about enhancing it.

Nevertheless, from the perspective adopted here, the problem of financial reporting opacity directly hinders the decision-usefulness of accounting information, and as such configure itself as a quality problem. This is particularly true when this opacity interacts with the considerable discretion that bank managers have in recording complex or long-term transactions, such as those involving derivatives or loans, nowadays at the core of commercial banks business model (and, not by coincidence, at the center of the AQR review – work blocks 4-7 and 8).

The lack of research on the link between accounting quality and manager pay prevent a discussion of the role of their relationship within banking. However, the previous discussion reveals two issues that are worth deepening. The first relates to the interaction of accounting

quality with equity valuation. In fact, the reaction of equity investors to signals of accounting quality is nothing more than an attempt to maximize the value of their equity ownership – by disciplining managers they are defending their investment. In other words, the reaction that we are trying to assess is nothing more than an investment decision. As such, the examination of how equity valuation interact with accounting quality is necessary. Moreover, another issue that require attention relates to the interaction between accounting quality and supervisory capital. Capital requirements are a distinguishing feature of banking, and cannot be ignored. Again, it is worth noting that those two issues are strictly linked to the 2014 ECB Comprehensive Assessment, who aimed also at testing the goodness of banks' regulatory capitalization to supply investors reliable information on the state of health of the banking system.

Equity Valuation Relevance

For what concern the equity-valuation relevance of signals of accounting quality, a first strain of literature investigates the valuation consequences of the loan loss provision (LLP). The loan loss provision deals with the estimation of the expected losses on the loans portfolio, and it is by far the most important accrual within the banking industry, whose nature involves considerable discretion on the estimates and conjectures at the basis of its formation. The magnitude of this accrual is rather relevant: according to Lobo (2017) the median ratio of LLP charge and earnings before LLP ranges between 15% and 20%, while the median ratio of LLP to equity is around 10%. As such, it should not come as a surprise that it is at the center of most financial accounting research that deals with banks.

For what concern its role in equity valuation, Beaver et al (1989) report that LLP is positively associated with market value. In giving an interpretation of this positive association, early studies concluded that it was due to the signaling role of loans reserves: the bank was communicating its earning power and willingness to deal with the problematic loans (Beaver et al, 1989; Elliot et al, 1991; Griffin et al, 1991). However, a successive study by Ahmed et al (1999) found a negative relation between LLP and stock returns. To solve the puzzle, Ahmed et al (1999) advanced the explanation that in the pre-BASEL regime the LLP increased regulatory capital, while in the post-BASEL world it decreased it. This suggests that the correct interpretation of past studies is not related to the signaling role of LLP, but to its effect on regulatory capital. This is a further evidence that investors appear to not be sensitive to "softer" (i.e. less obvious, in contrast to "hard" forms like AAERs and misstatements) forms of low accounting quality, but on the contrary, they might be easily fooled by creative accounting.

Beyond LLP, another literature strain deals with the valuation relevance of fair value accounting. Fair value accounting has substantial effects on banks' financial reporting if compared to manufacturing and service firms. This is due the fact that the utmost part of bank assets is composed of financial instruments, whose preferred valuation methodology is mark-to-market. This is considered optimal because it provides investors with up-to-date information on the financial statements, however critics argue that during market strains illiquidity make market values unreliable. Moreover, in relation to equity investing, Penman (2013) argue that including fair value in equity valuation models lead to a circular reasoning, who can reduce the investor ability to challenge prices (i.e. you cannot challenge market prices using market prices).

Reflecting theoretical disagreement, research on the issue is mixed. Altamuro and Zhang (2013) examine banks discretion is recognizing Mortgage Servicing Rights (MSRs) and find that level 3 fair value is more informative about future cash flows persistence in respect to level 2 fair value. Moreover, level 3 fair value has a stronger association with indicators of default risk and prepayment risk. They hence conclude that managers use accounting discretion to convey to investors better information about the banks' future performance. However Cheng (2012), in examining the association between fair value estimates of mortgage-baked-securities (MBSs) and the underlying observable economic factors, finds that with the adoption of the new FSP 157-3 (allowing greater discretion in valuing asset when the underlying market is inactive) the association weakened, result more in line with opportunism in fair value formation rather than signaling. In relation to equity risk, Riedl and Serafeim (2011) examine the association between equity betas and fair value. They find that banks with a higher exposure to level 3 assets have also higher equity beta, and interpret this information as implying higher risk. However, Hodder et al (2006) interpret a similar evidence as indicating higher quality information of fair values, because in their view it reflects risk components that historical cost is unable to capture.

Finally, another stream of research assesses the valuation implication of securitization accounting. In consideration of the fact that one of the main criticisms of asset securitization is its lack of transparency, Cheng et al (2011) examine the equity market pricing of this information uncertainty, and find evidence that banks with higher securitization volume and income present wider bid-ask spreads and more dispersed analysts' forecasts. This seems to reflect investors' difficulty in valuing so opaque operations. However, Dou et al (2014) use stock-returns volatility, options-implied volatility, and credit spreads, to find evidence of increased risk-relevance of securitization operations since 2006, suggesting that investors understood to some extent the higher risk involved with subprime securitization.

Overall, while the evidence on the implications of fair value accounting is too mixed to draw any conclusion, it seems that investors are able to some extent too see through banks' opacity when valuing equity (as exemplified by the research on securitization accounting), however they also tend to be fooled by creative accounting (as in the case of LLP relevance). This confirm that banks' opacity implies specific problems in term of accounting quality: the nature of the information matter.

Capital management and earning management

Another important stream of research investigates the accounting manipulations aimed at distorting earnings and capital figures. Here the novelty relates to capital management, which is a relevant difference is respect to non-financial firms, because it derives directly from industry specific regulation. In general, capital management can be defined as the use of accounting discretion in an attempt to favorably influence regulatory capital. As the previous discussion suggests, the main accrual used to identify this phenomenon is loan loss provision, however there are exceptions. The empirical strategy in principle is similar to the one used in manufacturing firms: the accruals generation process is modeled using both firm specific and macroeconomic variables, and after the model has been estimated its residuals (signed or absolute depending on the situation) are considered the discretionary component of LLP (Beatty and Liao, 2014).

In analyzing the studies that make use of LLP to identify abnormal accruals for earning and capital management, Beatty and Liao (2014) distinguish between pre-BASEL and post-BASEL period. This is due to the fact that in the US the adoption of BASEL 1 triggered an important change in the effect of LLP on regulatory capital. In fact, before 1988 loan loss allowances were included in regulatory capital, while after the adoption of BASEL 1 they weren't considered in the calculation of Tier 1. This regulatory change had important impacts on the interpretations of research results: before there existed a clear trade-off between earning and capital management, whereby banks with low capital ratios had an incentive in increase LLP accruals to meet the targets, and conversely for banks with low earnings before allowances. Consistently with this hypothesis, pre-BASEL studies find a negative correlation between regulatory capital and LLPs (Moyer, 1990; Beatty et al, 1995; Collins et al, 1995). The results for earning management are more mixed: Collins et al (1995) find a positive correlation between provision and earnings, while Beatty et al (1995) doesn't.

For what concern post-BASEL studies, Kim and Kross (1999) find evidence of a reduction in LLP accruals magnitude, while Ahmed et al (1999) report that the negative relations between regulatory capital and provisions weakened after BASEL 1. These findings are consistent with the change in incentives: now banks are incentivized to decrease loan loss provisions to increase regulatory capital. This in turn made more difficult to separate earning and capital management. On the other side, under the new regulatory framework the incentive to understate LLP is even higher, given their inflationary effect on both earnings and regulatory capital.

Beyond loan loss provision, another way that banks can use to manage capital and earnings relate to gain and losses recognition on securities. Beatty and Harris (1998) examine the correlation between earnings before securities gain and losses (SGLs) and SGLs. They report a negative correlation, consistent with the use of SGLs to manage earnings. Interestingly, they show that this correlation is stronger for listed banks than for private banks. They interpret these findings in light of the greater information asymmetry that quoted banks face, which in turn prompt them to manage earnings to convey private information to stakeholders. Hence, according to this interpretation earning management is not detrimental to accounting quality (at least from investors' perspective). In a successive study Beatty et al (2002) analyze again private and public banks, and find that public banks present target beating patterns through SGLs. This supplies further evidence in relation to the use of SGLs for earning management purposes.

Overall, evidence show that earning and capital management are common even within the banking industry. Moreover, we can note that opacity is at the center of the mechanism that allows this. In fact, the determination of the loan loss provision is highly dependent on the use of private information, and this makes difficult to external stakeholder to assess the appropriateness of its current level. Some form of assurance is needed.

2.4 – Conclusions

Overall, the main findings of this theoretical analysis can be summarized as follows:

- the dynamics underlying the phenomenon of executive compensation are more complex than it appears: the evolution of both its level and composition is articulated, altering periods of prolonged *status quo* to others of exponential changes;
- in turn, this complexity is reflected in the underlying theoretical elaborations. Three main views try to explain these dynamics: the shareholder value view, the rent extraction view and the institutional influences view;

- the analysis of management pay's effects on firm revealed that none of these views prevail over another, but on the contrary all contribute to some extent to explain the observed features of the phenomenon;
- there are documented relationships between accounting quality and executive compensation within the industrial sector: some compensation arrangements reveals to be detrimental to accounting quality, however managers in turn seems to be disciplined from higher accounting quality in term of interest alignment and labor market outcomes. However, a research gap exists for the banking industry;
- accounting quality and executive compensation presents specific features within the banking industry, who can be traced back to the greater opacity of banks: bank manager compensation is strongly tied to issues related to the optimal level of risk-taking, while the assessment of accounting quality in banks pass through the specific accrual of loan loss provisions (LLPs);
- additional incentives deriving from regulatory capital regulation must be duly accounted for in explaining banks' observed behavior;

All this suggests the hypnotized influences of accounting quality signals on management pay are likely. However, the specific features of the banking sector call for ad hoc solutions. Of particular concern is its opacity: how test shareholders' reaction to accounting quality signals, if those signals are uncertain in the first place? This is strongly linked to the executives' control of the financial reporting process.

To solve the issue there is the potential to exploit the 2014 ECB Comprehensive Assessment. This exercise aimed at improving the transparency of the eurozone's banking system, and did so by producing a great amount of information of banks' financial conditions through in deep analyses of their financial reports. As such, the next Chapter will be devoted to the assess if the procedure is indeed suitable to test the relationship.

Chapter 3 – The 2014 ECB Comprehensive Assessment

The 2014 Comprehensive Assessment[4] represented a critical step toward the implementation of the European Banking Union, in virtue of its pivotal role as a prerequisite for the start of the Single Supervisory Mechanism (SSM). Beyond its importance for the construction of a common European financial system, it offers also an interesting research opportunity for examining its effects on the European banking industry. Indeed, this exercise was specifically aimed at producing information on the banks' financial situation to be used by investors and other stakeholders to better assess banks' situation.

The main aim of this exercise was to test the resiliency of the European banking system. In consideration of this, the Comprehensive Assessment entailed the selection of a sample of significant eurozone banks, and the subsequent performance of an in-deep review of the quality of their assets' carrying values. The findings of this accounting review were meant not only to increase the transparency of banks' financial statements (and hence investors' confidence), but also to form the basis for a series of stress tests.

This event constitutes a valuable occasion to test the reaction of shareholders to evidence of accounting quality. Indeed, the main issue with the use of financial reporting as a mean of assessing executive performance resides in it being provided by the management itself. The Comprehensive Assessment by its very nature hit at the core of this problem, by providing an independent and in-deep evaluation of the goodness of the estimates provided by the management in past reporting years.

To test its suitability as a mean of testing banks' shareholders reaction to external signals of accounting quality, as well as to gain additional insights on how its structure may be exploited for research purposes, here is proposed a self-contained analysis of its main components. Particular attention will be paid to the AQR, a systematic assessment of banks' balance sheets.

3.1 – Background: the Single Supervisory Mechanism

The European Central Bank (ECB) specifically implemented the 2014 Comprehensive Assessment in view of its new supervisory functions toward European credit institutions, in force of Council Regulation (EU) No 1024/2013 of 15 October 2013. This regulation gave birth

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[4] This chapter is based on the official documents provided by the ECB (2014a, 2014b, 2014c, 2018).

to the SSM, composed by the ECB and the National Competent Authorities (NCAs) designated by each Member State. The SSM encompasses the whole eurozone, although it is open also to Member States who do not adopt the euro but are willing to strengthen their financial system by harmonizing with SSM standards. In this case, the NCAs of these non-euro area EU members gain similar rights to eurozone members, namely of being represented in the Supervisory Board, in Joint Supervisory Teams, and in other SSM working groups. However, by not being eurozone members they still do not have the right to be represented in the Governing Council. On the other side of the coin, differently from regular members they can opt out from the mechanism, under certain conditions.

The SSM is, alongside the Single Resolution Mechanism (SRM) and the Common Deposits Guarantee Scheme (CDGS), one of the three pillars that should lead to the achievement of the European Banking Union. As of today, only the SSM and SRM are operating, while an agreement on a possible CDGS has not been reached, yet.

The aim of the SSM is to ensure the soundness and safety of European banks and the stability of the financial system as a whole (ECB, 2018). This is attained by employing a multi-level supervisory system, where tasks are distributed to grant the maximum level of regulatory consistency across the whole eurozone, while at the same time leveraging the local know-how of NCAs (Figure 5). To this end, the organizational structure of the SSM is centered around the key distinction between Significant Institutions (SIs) and Less Significant Institutions (LSIs). According to the aforementioned regulation, are considered SIs the credit institutions that satisfy at least one of the following criteria: total value of assets above € 30 billion; economic importance for a Member State or EU economy; the value of its total assets is above 20% of the Country GDP and exceeds € 5 billion; it has requested or obtained funding from ESM or EFSF. Coherently with their systemic risk relevance, SIs are supervised directly by the ECB through the Joint Supervisory Team (JST - composed of both ECB and NCA members), while LSIs are under the direct responsibility of NCAs (and therefore ECB control is indirect). In this way, on one side the level-playing field and harmonization of the system is granted by the overarching presence of the ECB, while on the other side the local know-how and the principle of proportionality are respected thanks to the strong involvement of experts from NCAs and the less stringent nature of the control on LSIs.
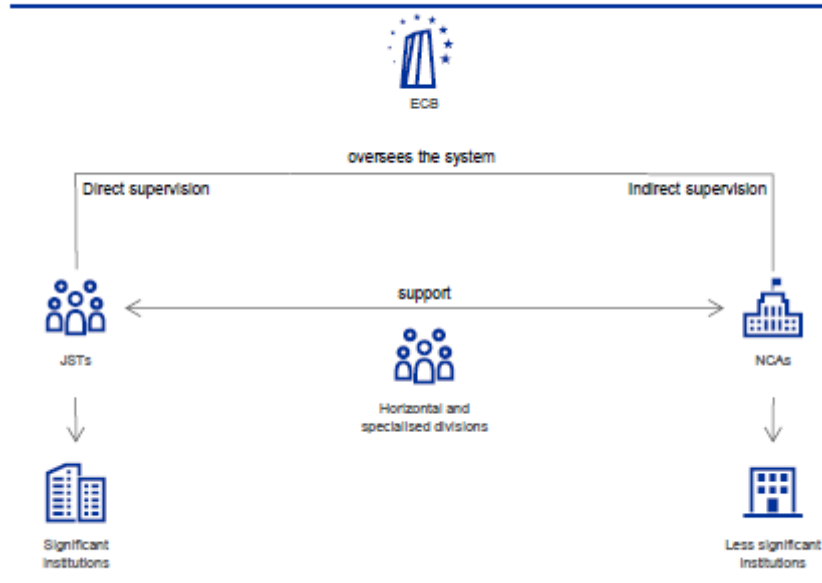
Figure 5 – *Source*: ECB (2018)

The supervision of SIs entails the execution of several tasks on the part of the JST, either directly or in collaboration with other groups. The most relevant ones regard the performance of SREPs (Supervisory Review and Evaluation Process) to assess the risk management processes and policies employed by the institutions (ICAAP and ILAAP review), the assessment of the adequacy of the members of management bodies (experience, reputation, conflict of interest, time commitment), stress tests execution as prescribed by EBA, the assessment of emerging risks and the possible execution of ad hoc in-depth analyses.

The supervision of LSIs is similar to the one of SIs. The SIs methodology is used as reference for LSIs to grant a high level of harmonization within the eurozone and a level-playing field within banks. However, the adoption of SIs framework come with some simplifications due to the respect of the principle of proportionality and to LSIs specific characteristics.

3.2 – The Comprehensive Assessment

The 2014 Comprehensive Assessment (CA) involved the examination of 130 credit institutions across 19 European countries, for a value in term of assets of € 22 trillion (81,6% of total assets under the SSM). The criteria for the inclusion are inspired to the significance criteria laid down in the SSM Regulation, and take account of the size and economic importance of the bank for the SSM Member State or the single market as a whole (ECB, 2014a):

- value of total assets over € 30 billion
- ratio of total assets to country GDP over 20% (only if total assets exceed € 5 billion)

- it is among the three largest institutions in the country

For inclusion, at least one criterion had to be met. In addition, even if the relevant values used in the process referred to December 2013, given the CA aim of forming a base for the future supervisory activities of the SSM, the ECB decided to apply a 10% margin of deviation in the size assessment of banks. This to grant the inclusion of borderline institutions, that would have probably been classified as significant in a few years. Moreover, three Lithuanian banks were included even if not formally part of the SSM as of November 2014 in view of the country's adoption of the euro in 2015. Overall, it is important to note that the application of this set of criteria lead to include in the comprehensive assessment also banks that under the SSM were currently classified as LSIs.

Further segmentations of the included banks were made both within the Asset Quality Review and the Stress Testing phases (ECB, 2014a). In the AQR, of the 130 participating banks, 76 were selected for the level 3 fair value exposure review (work block 8), an in-deep examination of possible mis-valuations of complex financial instruments and other level 3 assets. For what concern the stress tests, included banks were furtherly classified within three categories: non-restructuring banks, restructuring banks whose plan was approved before 31/12/2013, and restructuring banks whose plan was approved after the 31/12/2013. This classification had important implications for the approach used during stress tests. The 101 banks classified as non-restructuring had their stress tests performed under the static balance sheet assumption, while the 24 banks on the second category were allowed to perform stress tests under the dynamic balance sheet assumption (i.e. considering the implementation of changes provided by the restructuring plan). Finally, the 5 banks in the third category had the possibility of performing stress tests using both approaches: the supervisory response for these banks would be based on the static balance sheet results, however the result of the dynamic approach would be taken into consideration in the definition of remedial actions.

Finally, it must be noted that most of biggest European banks have significant cross-country activities, which lead them to control subsidiaries in other Member States that would meet by themselves the aforementioned thresholds. However, in the application of the inclusion criteria, as well as in the performing of the asset quality review and stress tests, the credit institutions were treated according to the highest level of consolidation. The only exception relates the subsidiaries that are among the three biggest banks in an SSM Member State.

3.2.1 – Rationale of the CA

As the name suggests, the general aim of the Comprehensive Assessment was to supply an overall valuation of the soundness of the European banking system and of the health of banks' balance sheets. The end result has been to make visible and address solvency problems of SSM credit institutions in an effort to increase the resiliency of the financial system to future crises. This has been accomplished by working on three interlinked objectives: repair, transparency, and confidence building (ECB, 2014a).

Repair consisted in the identification and implementation of remedial actions to overcome the weaknesses and mitigate the solvency risk emerged during the supervisory assessment. This objective has been accomplished by systematically reporting in specific templates the results of each work block (e.g. poor collective provisioning models) and the remedial actions deemed appropriate to face the shortcomings identified (e.g. use of effective interest rate for impairment instead of market interest rates). These templates would have formed the basis for the work of Joint Supervisory Teams in following up these deficiencies.

The Transparency objective aimed at supplying high quality information on the financial conditions of eurozone banks, to ease the valuation of their solvency by external parties. The objective has been accomplished by the publication of detailed information concerning the results, processes, and methodologies applied in each stage of the Comprehensive Assessment. This involved the publication of detailed templates for each bank as well as of an Aggregate Report on the whole process.

Finally, the Confidence Building objective aimed at assuring to stakeholders that banks will be sound and stable after the implementation of remedial actions. The accomplishment of this objective was a natural outcome of the past two objectives, who should have supplied the facts (Transparency) and the confidence (Repair under JSTs oversight) for renewing thrust toward banks. It should be noted that the confidence building exercise interested not only depositors, firms, and local communities, but also (some would argue mostly) other banks. In fact, the interbank money market has a crucial role in transmitting monetary policy as well as in granting the liquidity of the banking sectors. However, the past financial crisis demonstrated that high information asymmetry and perceived counterparty solvency risk can lead banks to hoard liquidity, consequently freezing those crucial markets (Temizsoy et al, 2015).

3.2.2 – Components of the CA

The Comprehensive Assessment relied on two pillars: the Asset Quality Review and the stress tests.

The Asset Quality Review aimed at assessing and, if needed, rectifying the carrying values of banks' balance sheet assets as of 31 December 2013 (ECB, 2014b). This prudential exercise is based on the simple consideration that a stress test based on balance sheet data can be no better than the accounting data on which it relies. Moreover, the use of harmonized criteria and methodologies allowed to enhance the comparability of banks' results. The AQR consisted of 9 interlinked work blocks that resulted in an AQR-adjusted balance sheet and a consequent AQR-adjusted solvency ratio (or CET1 ratio: CET1/RWA) enabling a preliminary assessment of banks' situation (AQR threshold: 8%). Moreover, each work block offered the possibility of discovering deficiencies and conceive related remedial actions that will form the basis for future JSTs supervisory works.

The AQR resulted in adjustments for € 47,5 billion to SSM credit institutions' carrying values (ECB, 2014a). However, as the ECB reports point out, it should be noted that the presence of an AQR adjustment does not necessarily imply a breach of accounting standards. In fact, the CA was a prudential exercise, not an accounting one. As such, while considering the rules implied by IAS/IFRS and national GAAPs, in situation were more than one approach was consistent with accounting rules the nature of the exercise lead to choose the approach more coherent with prudential and economic logic. Hence, most of these adjustments do not indicate that banks failed to comply with relevant accounting standards, and consequently they do not need to be reflected in their official financial statements.

In relation to the stress tests, their main objective was to assess the solvency of SSM banks under two hypothetical economic scenarios, a baseline scenario and an adverse scenario (ECB, 2014a). The baseline scenario was provided by the European Commission and reflected the most probable scenario, while the adverse scenario was conceived jointly by the European Systemic Risk Board (ESRB), the European Banking Authority (EBA), the ECB and NCAs, and aimed at reflecting the consequences of the materialization of the most important threats to which the European banking system was exposed at the time. Stress tests were performed by the banks under the ECB supervision and following EBA methodologies.

3.2.3 – Quality Assurance

In consideration of the frictions between the decentralized nature of the process and the confidence building objective the Comprehensive Assessment, the ECB organized a systemic and pervasive quality assurance mechanism to grant the consistency as well as the credibility of the results. The quality assurance was based on the oversight of ECB and NCAs at the SSM and national level, respectively, and has been organized in function of the two pillars on which the whole process rested: the AQR and the stress tests (ECB, 2014a).

The AQR quality assurance was based on four steps: three "lines of defense" and an additional "transversal" support role (Figure 6). The first step was composed by NCAs bank teams. Those team of professionals worked directly with credit institutions and were responsible for actually performing the quality review of banks' assets according to ECB's methodologies and guidance. Of primary importance was their composition: a mix of NCA staff, independent auditors, appraisers, and other external professionals, selected having regard to preserve the staff independence, by excluding former statutory auditors as well as NCA staff involved in the routine supervision of the bank. After this, the NCA bank teams had to forward their work to central NCA team who performed a quality check assuring the quality of the results and consistency of the outputs across the country. Being the second step NCA team kept in close contact with ECB and adopted the organizational and operating model required by it. Finally, the last step involved the examination of AQR outcomes and methodological consistency by the ECB and their appraisal according to an SSM-wide perspective (i.e. having regard to other institutions results).

In addition, there was another transversal player in the AQR quality assurance process, the ECB Country Teams. Those teams were responsible for maintaining a liaison between the ECB and several NCAs (each team authority covered from one to four NCAs) and guarantee that each country specificities where duly accounted for while maintaining a level playing field.

Accordingly, the aims of stress tests' quality assurance were similar to AQR's ones, namely maintaining a level playing field and focus on material issues (areas displaying anomalous results). On the other side, the stress test quality assurance was based on a less articulated process. This should not come as a surprise, considered the different nature of the two activities.
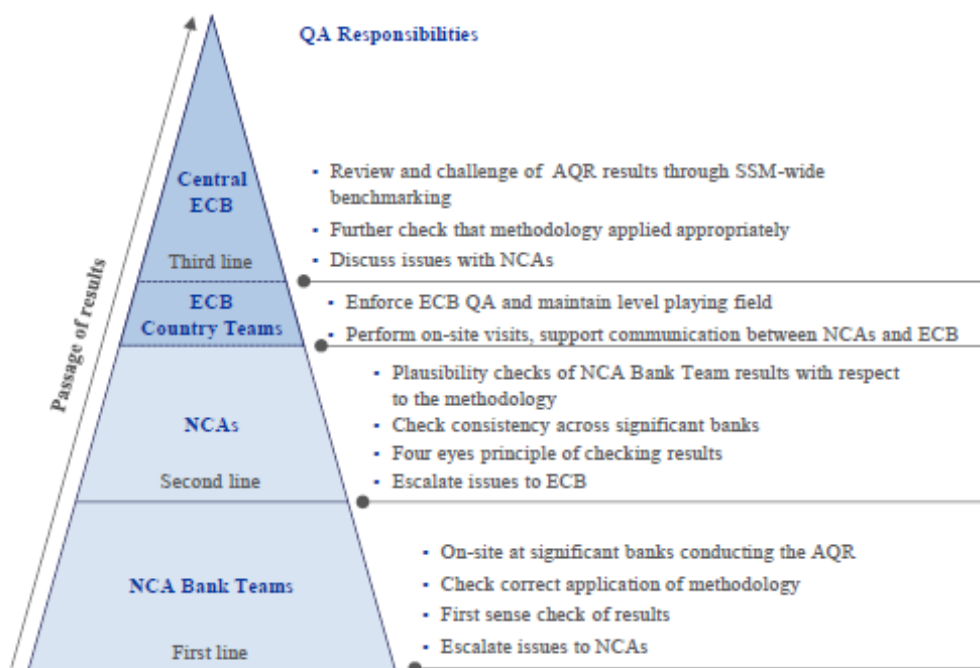
Figure 6 – *Source*: ECB (2014a)

In general, the stress test quality assurance was based on two steps. The first was under the responsibility of NCAs, and was aimed at assuring that the stress tests performed by banks were in line with EBA methodologies. The controls design was under the responsibility of individual NCAs, and encompassed checks on the quality of data and consistency of the results. The second step involved the review and challenge of the outcomes by the ECB, always according to an SSM-wide perspective aimed at maintaining the harmonization of the results. This step involved data and template integrity analysis, quantitative check and qualitative checks.

3.3 – Asset Quality Review

Although the AQR was meant just as a preliminary phase for the stress testing exercises, in doing it the ECB ended up producing valuable statistics concerning the accounting quality of several leading European banks. From this follows the need for an examination of the process through which those data have been generated.

Overall, the Asset Quality Review has been organized in two Phases. Phase One is dedicated to the selection of asset portfolios that will be subject analysis, while Phase Two is dedicated the review of those portfolios' carrying values. Phase Two can in turn be divided into 9 work blocks, each dealing with a specific step of the review process (Figure 7).

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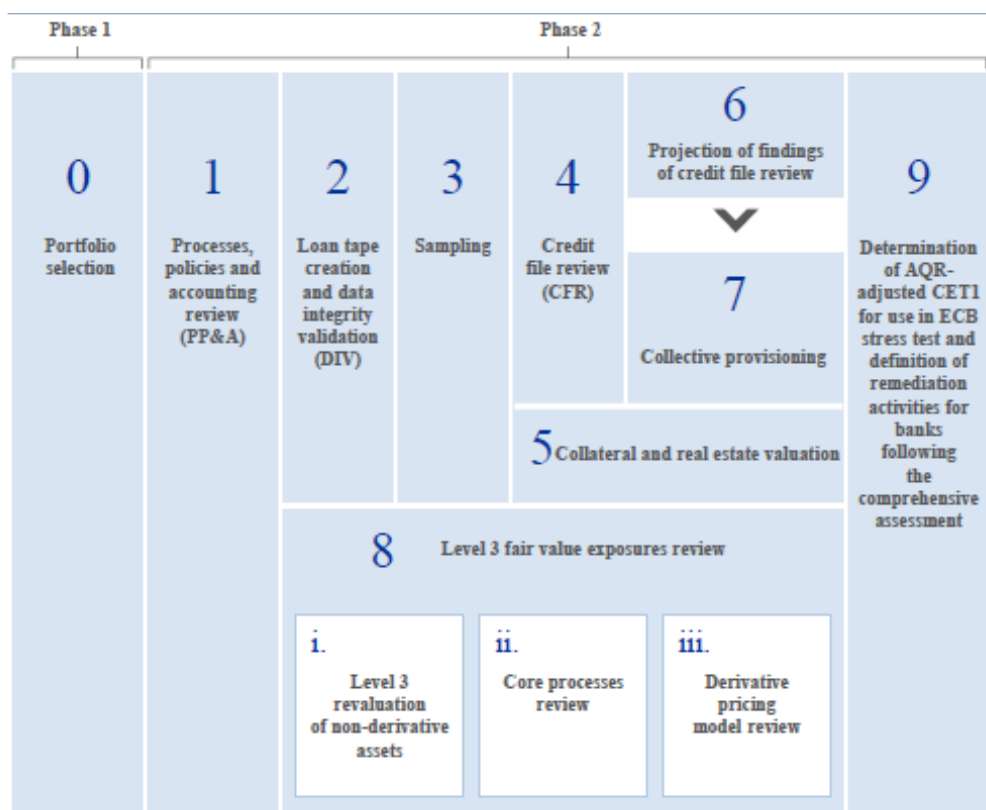
Figure 7 – *Source*: ECB (2014a)

3.3.1 – Phase I

The portfolio selection phase has been designed to focus AQR efforts on those asset portfolios most likely to present quality problems i.e. lack of transparency, not enough prudential methodologies or material misstatements. To this end, the ECB guidelines imposed NCAs bank teams a risk-based portfolio selection approach, able to identify those portfolios that could have a material impact on the CET 1 ratio (ECB, 2014b).

This process begun with gathering of substantial amount of data concerning all assets held by each bank, encompassing default data and other risk-sensitive information, and their subsequent use for the creation of portfolios of related assets.

After this, portfolios to be analyzed were selected according to a risk-based approach that considered several factors such as asset type, provision and collateral coverage, and supervisory history. This method granted both an efficient and effective use of resources on the part of supervisors, allowing to concentrate efforts on the analytical review of each single position in Phase Two. However, it should be noted that this approach by virtue of this particular selection procedure leads to a biased sample of accounting misstatements, so it would be incorrect to extrapolate the findings to non-selected portfolios.

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3.3.2 – Phase II: preliminary activities

After having set the stage with portfolio selection, the second phase markes the start of the execution of the AQR. The first three work blocks handle the assessment of the bank internal accounting process and the selection of the positions that will be subject to credit analysis (ECB, 2014b).

Accounting processes have a key impact on balance sheet's carrying values by directly affecting the probability of misstatements, and are consequently a key drivers of banks' accounting quality. That's why the first work block deals with the Processes, Policies and Accounting review (PP&A), and is aimed at assuring that the bank has in place a robust set of accounting practices able to grant the correct interpretation and application of relevant accounting rules (IAS/IFRS or National GAAPs). The ECB methodology prescribed specific areas of analysis, concerning among the others the classification of financial instruments, the application of fair value hierarchy, and the definition of non-performing exposures.

Next, the second work block consists in the Loan Tape Creation and Data Integrity Validation (DIV). This is the first step of AQR credit analysis and entail the supply from the bank of "loan tapes" (records covering details about single exposures like product characteristics and credit performance) containing information about loans and other exposure (including OBSE, like financial guarantees) comprised in the previously selected portfolios. Once the loan tapes are completed, the NCA bank team will perform the DIV through a series of checks (e.g. are all 90 days past due flagged as NPE?) and subsequently undertake remedial actions in relation of any deficiency discovered (e.g. flag as NPE). The aim of this second work block is to ensure that the data on which the credit analysis is performed are of sufficient quality, a prerequisite for truly improving the transparency of banks' balance sheets.

After having ensured their quality, the loan tapes within each portfolio are ready to be analyzed. However, we must consider that given their dimension a file-by-file review of every exposure is not feasible. That's why the third work block consist in the sampling of loans tapes. More specifically, the ECB prescribed the adoption of a risk-based sampling, thereby allowing to concentrate the resources in the more uncertain parts of the portfolio (in line with international auditing standards). To attain this, the procedure firstly prescribed to exclude from the sampling procedures all retail exposures (except for mortgages) as well as all sub-segments whose characteristics make them less subject to issues (e.g. Debt/EBITDA<1, Equity/Assets>50%). After this, the remaining part of each portfolio was subject to stratified sampling, each stratum

being defined by exposure size and by risk (using basic risk indicators, like past due) and a random sample being extracted from each stratum. The sample size depended on each stratum characteristics: homogeneity and concentration of the portfolio, adequacy of the forbearance flag, number of observations and riskiness of the strata.

3.3.3 – Phase II: credit analysis

Once the sample has been collected, AQR procedure prescribes to begin the credit file review (ECB, 2014b). The credit file review consists of an exposure-by-exposure analysis aimed at assessing if each exposure has been properly classified (e.g. NPE status), if an individual provision is needed, and whether it has been set at and adequate level. The credit exposures subject to analysis comprise loans, financial leases and other OBS exposures, and encompasses those exposures classified under sovereign, corporate, institutional, and real estate exposures (only classification review), selected during sampling.

This fourth work block mark the start of the analyses that will eventually lead to the adjustment of bank's assets carrying values and the determination of an AQR-adjusted CET1 ratio. However, it should be noted that the prescriptions applied during the credit file review for the classification of exposures and the determination of individual provisions reflect prudential standards and thresholds set by the ECB. As such, those adjustments to carrying values and provision do not necessarily need to be reflected in banks' official financial statements, unless they result from breach of accounting rules. However, AQR-adjustments may nonetheless lead to the need for additional regulatory capital in the event of shortfall, even in case of compliance with accounting standards.

According to the AQR Manual, the credit file review is composed of three steps: the CFR data preparation, the review of the classification of the exposures, and the review of individual impairment and provisioning. The data preparation is aimed at ascertaining that all necessary information is available about each debtor. This is aimed at integrating the loan tapes data to enable the NCA bank team to properly perform the classification and the individual provisioning.

Next, the classification review entail verifying the correct classification of sampled exposures according to 5 categories: impaired exposures, non-performing exposures, regulatory exposure class, AQR asset segment, related party exposure.

The impairment status is related to the application of IAS 39 (now substituted by IFRS 9), that mandate to banks to assess whether an asset shows an objective evidence of impairment as a

result on an event happened after its initial recognition. To this regard the AQR methodology prescribe to confront the classification put in place by the bank's internal system with an ad hoc classification consistent with ECB guidelines, and eventually reclassify the exposure according to the latter. The AQR methodology require a two-step approach: first the exposure is examined to assess if a loss event has happened as a consequence of one or more of the minimum triggers (provided by AQR guidelines), and second the assessment of whether the loss event has an any impact on future expected cash flows (not only a decrease, but even a delay). If that's the case, the exposure is classified as impaired. Moreover, as a consequence any other on- and off-balance-sheet exposure of that debtor is automatically classified as impaired.

For what concern the other categories we have that:

- NPE classification consider both the internal classification used by the bank and the EBA classification (having regard to the previously determined impairment status);
- regulatory classification considers the categories prescribed by articles 112 and 147 of Capital Requirement Regulation (depending on whether the bank applies the simplified or the IRB approach to credit risk);
- AQR asset segment classification take as a reference the definition provided by ECB;
- the classification of exposure toward related party are based on the definition provided by IAS 24.

After that each exposure has been adequately classified, the final step of the credit file review entails the review of individual provisioning levels. This third step regard those exposure that have been previously classified as impaired, needing a provision, or likely to result in future losses (i.e. an impairment trigger is not present, but the exposure characteristics make it likely to result in a loss). The approach to determine the required impairment involve three tasks.

The first task relates to deciding which approach between the "going-concern" and the "gone-concern" is more suitable to determine the recoverable amount of the exposure through DCF analysis. This is equivalent to assess the most likely outcome of the debtor. Under going-concern the debtor continues to produce cash flows in the future, and the collateral may be liquidated if needed without materially influencing the capacity to generate operating cash flows. In practice, this outcome is likely if future cash flows are substantial and can be reliably estimated, and the collateralization is limited. On the contrary, under gone-concern the cash flows cease and the collateral is surely exercised, outcome which is more likely in case estimated cash flows are insignificant or negative and the collateral is central to the debtor activity.

The second task deal with the performance of a DCF analysis informed by the designated approach. According to the gone-concern assumption the cash flows cease and the collateral is sold, so that the recoverable amount is estimated as the bank's share of the present value of the liquidation proceeds, net the cost incurred for liquidating the collateral.

On the other side, the going-concern approach assumes the cash flows to continue and the exercise of the collateral as a feasible option. In this case the recoverable amount is calculated as the bank's share (considering both seniority and the relative value of the claim) of the present value of the debtor future cash flows, to which is added the value of the collateral.

Finally, the additional impairment is determined as the difference between the recoverable amount and the carrying amount. In case the recoverable amount is greater that the carrying amount no revaluation is allowed, however it is possible to reverse past individual provisions.

The previous methodology allows to appreciate the importance of collaterals value as a key input in determining adjustments to individual provisioning levels. Consequently, the valuation of collateral can be considered a key ingredient in determining the soundness and credibility of AQR results. This lead to discuss the work block number five, concerned with collateral and real estate valuation. As Figure 7 suggests, this task was performed in parallel with the other work blocks dealing with the credit analysis. The ECB methodology prescribe that the value of collaterals and reals estates must be based on market values, reflecting the expected conditions under which they might be liquidated. The updating of collateral values is executed either by having it valued by and independent third party or by updating a recent independent external market valuation.

The adjustments of the credit file review concerned only the sampled assets, however the prudential nature of the AQR imposes a much wider analysis. Moreover, the CFR dealt only with individual provisioning, though accounting standards require also the execution of a collective provisioning for performing exposures. Those two aspects are dealt with in work blocks six and seven.

Work block six is concerned with the projection of the findings of the CFR to the unsampled parts of each portfolio, in accordance with international audit standards (ISA 530). The metrics to be projected relate to impairment provisions, NPE classification (for use in work block seven), and expected losses on exposures that have not triggered any impairment indicators but for which a loss is likely. The projection is based on the application of the sample weighted average of misstatements to the unsampled part of each stratum. Those projections are accompanied by a range of safeguards to avoid the overestimation of misstatements, such as

the exclusion of trivial misstatements or the application of alternative statistics to project the results under certain conditions.

After the conclusion of the projections, work block seven provides for the execution of a collective provisioning analysis. This analysis applies to all performing exposures as well as to retail non-performing exposures. The work block is divided between a qualitative and a quantitative assessment of the level of collective provisions. The qualitative analysis consists in a review of the methodology that the bank adopts for the calculation of collective provisions, to test its adherence to accounting rules. After this, the quantitative analysis involves the estimation of a statistical model used to challenge the bank's current level of collective provisioning. After the model has been estimated, its results are compared to bank's calibration. Depending on the result, different courses of actions will be taken:

- If the bank's aggregate provisions are higher than the NCA bank team's estimates, then there is no issue;
- If the bank's aggregate provisions are lower than the ones estimated by the challenger model, but the deviation account for less than 5% of the estimated amount, then it is considered insignificant and bank's estimates are accepted;
- If the bank's aggregate provisions are lower and the deviation is between the 5%-10% range, but the NCA bank team believe that there is a good reason related to non-material differences in data or methodology, then there is no issue:
- In any other case, the NCA bank team engage in an in-deep investigation to understand the reasons for the deviation. If from the investigation results that the bank cannot objectively justify its current level of collective provisioning, then challenger model is used to estimate the amount for which collective provisions must be adjusted.

Beyond its possible impact in the AQR-adjusted CET1 ratio, the statistics used to estimate the challenger model (such as impairment rate, cure rate, loss given impairment, etc.) will feed into the stress tests executed after the AQR. This is another important way in which AQR contribute to the reliability of stress test results.

3.3.4 – Phase II: level 3 exposures review

After having completed the credit analysis comprising work blocks 4-7, there remain one last work block aimed at rectifying bank's carrying values – and consequently its CET1 ratio. Work block eight is dedicated to the level 3 fair value exposure review (ECB, 2014b). It is a particular work block, because its methodology dictates that not all selected banks need to take part to

this review. Indeed, of the 130 banks subject to the Comprehensive Assessment, just 76 had to perform it. In general, this work block aims at assessing if banks can appropriately evaluate the assets comprised under the classifications (ex IAS 39): available for sale, designated at fair value through profit and loss, and held for trading. More specifically, it concentrates on level 3 assets ex IFRS 13 i.e. those assets valued using non-observable market inputs. The review consists of three elements.

The first element is the level 3 revaluation of non-derivative assets. To this review will be subject banks that during Phase One have been judged to hold a material amount of such assets. Operationally the assets in scope are: fair-valued loan portfolios, level 3 single name bonds, level 3 securitizations, held real estates, and equity investments in private firms. Each of these assets categories will be assessed for materiality, and in case analyzed. For each category, the analysis entails the gathering of a sample and the application of the valuation methodologies described in the AQR manual. If deviations exist between the bank's value and the value determined by the NCA team (or, occasionally, third parties), they are investigated by comparing the bank's valuation model with NCA methodology. In the case were the NCA bank team deem its valuation appropriate, the bank must adjust its carrying values.

The second element is the core processes review. This element involves a qualitative assessment of the processes that lead to the determination and monitoring of trading book fair values and related adjustments. The review will encompass processes such as the pricing model validation and new product approval, whose importance could lead to material misstatement of carrying values. Those processes will be assessed along six dimensions: governance; calculation and methodology; scope and coverage; timeliness; reporting and actions; systems and data. The outcome of the process won't be an adjustment to CET1, but the issuing of a report concerning the remedial actions that must be undertaken to remedy any deficiency highlighted by the review.

The last element regards the derivative pricing models review. This review is concentrated on the assessment of the robustness of the main models used by the bank in valuing complex derivatives, whose input cannot be observed in the market. The set of models for review is defined during Phase One, and concern those models who have a higher coverage of level 3 derivative exposures (i.e. high model risk). The model assessment is conduced along four lines: model use, model assumptions, input data, and model calibration. Despite the qualitative nature of this review, whenever a deficiency is identified the NCA bank team will not only issue a report containing the necessary remedial actions, but also try to quantify the impact of those deficiencies in term of an adjustment to CET1 ratio.

3.3.5 – Outcomes of the AQR

Finally, work block nine was dedicated to the closure of the Asset Quality Review (ECB, 2014b). This last work block provided the methodology for the calculation of the AQR-adjusted CET1 ratio, so that the results of the AQR could properly be included in the stress test phase. In addition to this, the NCA bank team is required to draft a comprehensive report outlining all the remedial actions needed as well as all the AQR finding that must be included in the future financial   statements.
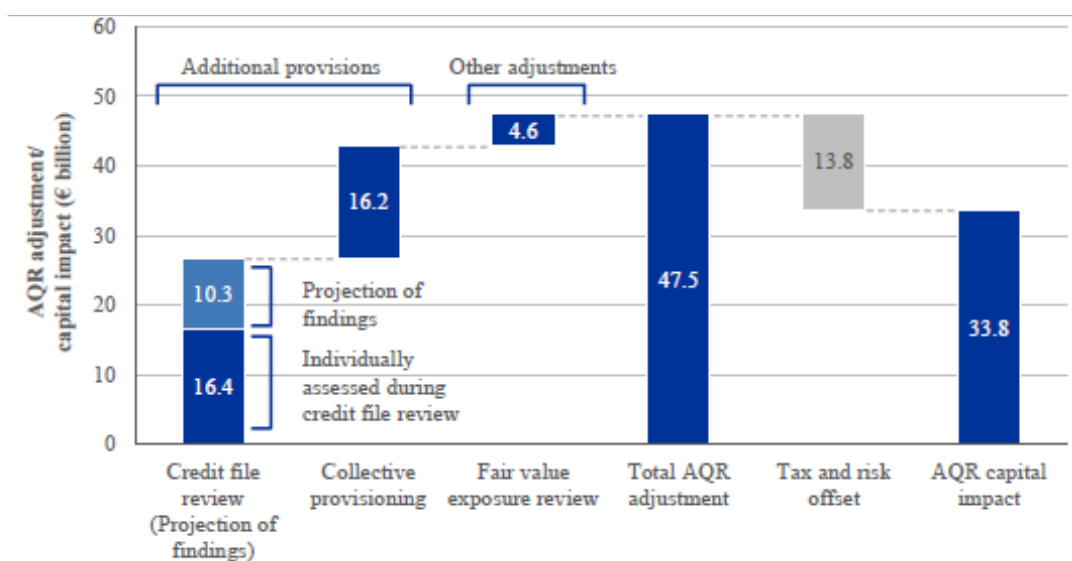
Figure 8 – *Source*: ECB (2014a)

For what concern the AQR outcomes (ECB, 2014a), from Figure 8 we can observe that it resulted in a total AQR adjustment of 47,5 billion euros. As expected, 90% of the adjustment is driven by additional provisions. Within this latter category, 62% is due to individual provisions. To determine the actual impact that will be considered during the stress test, we must subtract 13,8 billion due to tax (savings from losses) and risk (insurance schemes against losses) offsets. This lead to a net AQR capital impact of 33,8 billion euros.

In relation to the SSM-wide impact of AQR, Figure 9 illustrate the distribution of gross AQR adjustments across countries. In term of net adjustment to CET1, the mean adjustment by country ranged from -0,2% to -2,9%, reaching a peak on an individual bank level of -5,8%. The impact is significant, in consideration of the 8% threshold.
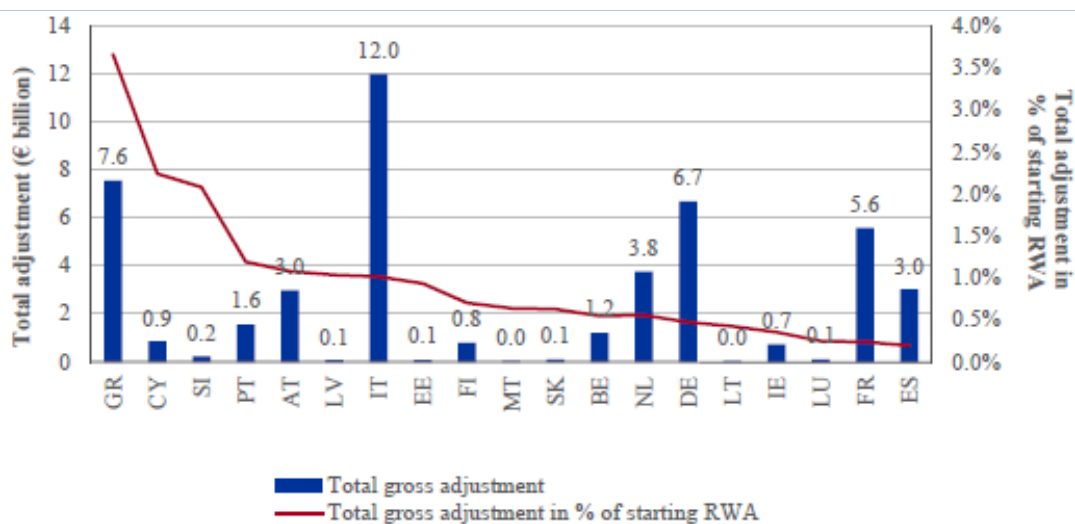
Figure 9 – *Source*: ECB (2014b)

3.4 – Stress Test

After the Asset Quality Review, the second major component of the Comprehensive Assessment are the stress tests. Stress tests are simulation exercises aimed at assessing the consequences of hypothetical unfavorable scenarios on an institution's economic conditions. In the context of the CA, they are aimed at assessing the impact of a baseline and an adverse scenario on the solvency conditions of eurozone banks (CET1 ratio) (ECB, 2014a). Note that, even if the baseline scenario represents a likely future state of the world, the use of other conservative methodological assumptions makes its result unlikely to manifest. For example, the use of static balance sheet assumption entails keeping constant its composition, allowing only for dimensional growth, and as such does not take into account the strategic moves that a bank would do under said conditions (like the reduction of leverage), leading to biased forecasts. That's why it must be kept in mind that the Comprehensive Assessment is a prudential exercise, not a forecast.

3.4.1 – Methodology

Stress tests were performed by banks, under the supervision of ECB and NCAs, following the methodologies prescribed by EBA (ECB, 2014c). In line with the AQR, those methodologies mandated the use of the highest level of consolidation, with the exclusion of the insurance business. Moreover, they used as default assumption the static balance sheet, although depending on the presence of approved restructuring plans they allowed the use of a dynamic balance sheet approach, to reflect restructuring efforts. Each bank's stress test simulations were

reviewed through a Quality Assurance process to grant the credibility, consistency and comparability of the results. Stress tests followed the AQR and incorporated its findings through a join-up process. The join-up allowed to take account not only of the net AQR-adjustment to CET1, but also of AQR findings concerning the classification of exposures and the likely evolution of bank specific risk parameters (e.g. LGD, PD, RR). Overall, the stress test covered the following risk dimensions: credit risk, market risk, cost of funding and interest income, sovereign risk, securitization risk, non-interest income and expenses path.

3.4.2 – Outcomes

The critical solvency thresholds in term of CET1 ratio (CET1/RWA) for the baseline and the adverse scenario were 8% and 5,5%, respectively. A capital shortfall was identified in case of breach of one of these thresholds as (considering also AQR 8% threshold):

$$CS = \max[SF_{AQR}, SF_{BS}, SF_{AS}] \cdot RWA$$

$$SF_i = |TH_i - adjCET1_i|$$

Figure 10 show the country-by-country median stress test impact for the adverse scenario. As expected, these results are in line with those in Figure 9. The median reduction in CET1 ratio of 4% is rather critical, resulting in a shift on the median value from 12,4% to 8,4%.

In term of shortfall, Figure 11 offers the disaggregation of the total capital shortfall by component and country. This graph helps to appreciate the pivotal role played by the AQR, both in term of direct CET1 ratio adjustment as well as in term of new information on asset performance used in stress testing (gray and light blue areas).

Overall, of the 130 banks subject to the Comprehensive Assessment, 25 revealed a shortfall in at least one area: 16 on the AQR, 18 on the baseline scenario, and 24 in the adverse scenario. The total shortfall across those 25 credit institutions amounted to 24,62 billion euros. However, we must consider that those shortfalls reflect the situation as of 31 December 2013. By the end of the Comprehensive Assessment (September 2014) additional capital had already been raised by those banks, lowering the actual shortfall to 9,47 billion euros and the number of deficient banks to 13 (ECB, 2014a).
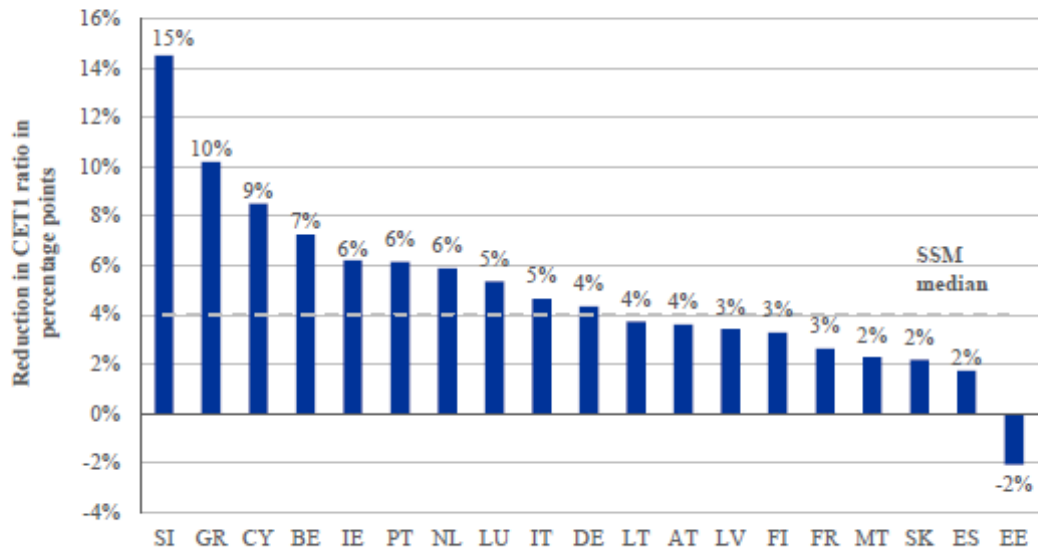
Figure 10 – *Source*: ECB (2014a)
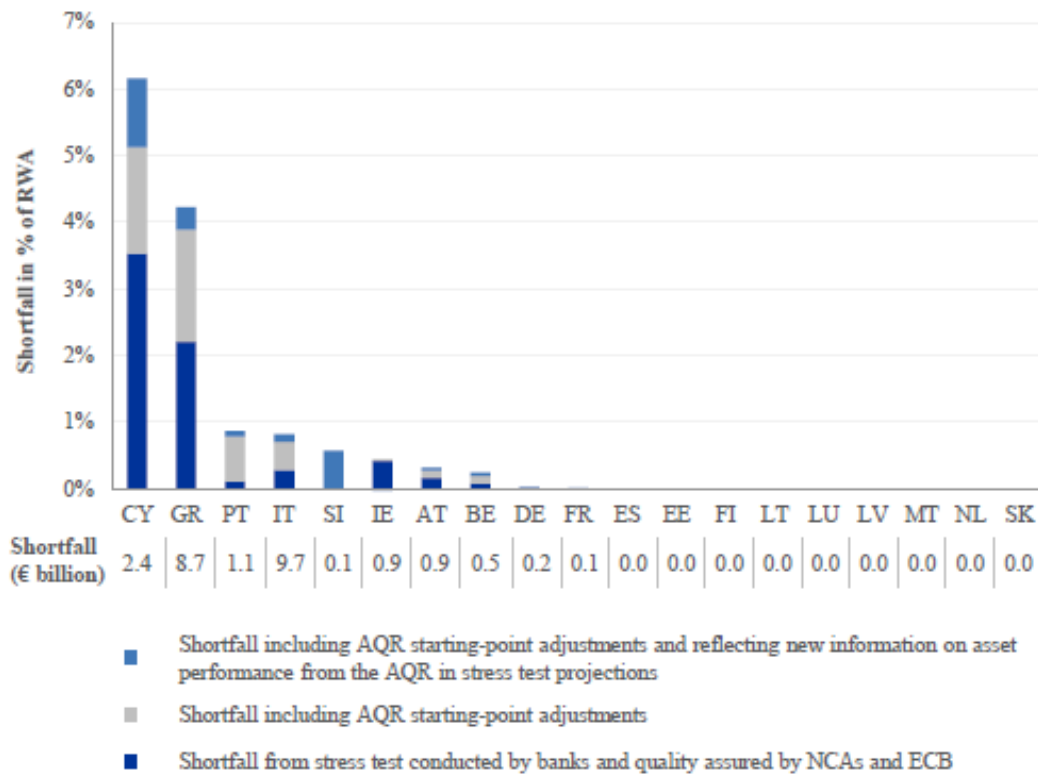
Figure 11 – *Source*: ECB (2014a)

3.5 – Conclusions

The examination of the 2014 ECB Comprehensive Assessment was motivated by the necessity to test its suitability as a mean of investigating the reaction of banks' shareholders to external signals of accounting quality. This requirement seems satisfied:

- the objectives of the CA explicitly aimed at increasing the transparency of banks' balance sheets. This led to an analytical examination process explicitly tailored to each banks' needs, granting the production of high-quality third-party information on individual banks' financial conditions. Moreover, the results of this process were explicitly meant to be directed to shareholders. This public good component makes them perfect to test their reaction;

- the CA provided for a consistent and harmonized methodology to be applied across the whole eurozone, granting the comparability of the results. In turn, this was further strengthened by the implementation of a pervasive quality assurance mechanism;

- the Asset Quality Review phase produced valuable data on the carrying values of each banks' balance sheet assets, targeting critical activities such as loan provision and complex financial products, who the theoretical analysis in the previous chapter revealed to be important proxies of accounting quality in banking literature. Indeed, as much as 90% of the total AQR adjustment is given by loan provisions, and the remaining part by level 3 securities value adjustments (conceptually similar to SGLs). Both these adjustments reflect the aforementioned problems related to earning and capital management. This consistency offer *prima facie* evidence for the goodness of the CA results as proxies of banks' accounting quality;

- the Baseline Scenario Stress Test provided shareholders with a semi-forecast considering the implications of the findings of the AQR, in this way providing shareholders additional insights on the going-concern implications of AQR's rectifications.

However, the analysis also allows to appreciate some possible pitfalls in the use of these data:

- the CA selection procedure was non-random, but based on the complex concept of Significant Institution that consider several criteria such as size and country-specific economic importance;

- despite the harmonized regulatory framework, the CA encompassed banks operating in countries with significantly different economic systems, both in relation to their

structure (e.g. Western Europe vs Eastern Europe) and performance during the relevant period (e.g. Norther Europe vs. Southern Europe);

These problems in turn raise issues concerning possible sample-selection and omitted-variable biases that must be specifically addressed to grant the quality of the empirical results.

Chapter 4 – Hypotheses Development and Research Design

4.1 – Hypotheses Development

The theoretical analysis revealed that executives seems to be influenced by signals of low accounting quality, at least in industrial firms. This demonstrates that shareholders are receptive on issues of earnings quality, and can be classified as informed principals. However, the lack of transparency of the banking sector posed specific problems related to the right proxy to use and the interaction of accounting quality issues with regulatory capital. To overcome the problem, the possibility to exploit the 2014 ECB Comprehensive Assessment has been advanced. The follow-up analysis of the event revealed it to be suited for the end. This allows to formulate the following research hypothesis:

RESEARCH HYPOTHESIS: Managers in banks whose regulatory capital was more strongly reassessed by the ECB during the 2014 Comprehensive Assessment were more significantly affected by their shareholders in term of compensation

In practical terms, the empirical validation of this hypothesis requires a further elaboration: what do we mean by managers? Throughout the thesis expressions like "manager" and "executive" have been used with a certain freedom. However, their precise characterization is necessary both theoretically, to qualify the previous statements, and empirically, to operationalize the construct and collect meaningful data.

In trying to settle the issue we note that recently European regulators had to deal with a similar problem when issuing the EU Directive 2017/828. This directive aims at strengthening shareholders rights within the European Union and in doing so establishes, within other things, the obligation to report on director remuneration. In operationalizing the concept, in Article 1 the Directive specifies that:

"*director means:*

   (i)   *any member of the administrative, management or supervisory bodies of a company;*

(ii)   *where they are not members of the administrative, management or supervisory bodies of a company, the chief executive officer and, if such function exists in a company, the deputy chief executive officer;*

(iii)   *where so determined by a Member State, other persons who perform functions similar to those performed under point (i) or (ii);"*

This definition is exceptionally wide. Indeed, most studies concerned with executives compensation usually focus on CEOs or other C-suits. On the contrary, the directive encompasses at point (i) a great range of individual, relegating CEOs at point (ii) and even providing for a residual category in point (iii). The wide scope of applicability of this Directive suggests that regulators recognized that the principal-agent relationship embedded within the governance mechanism of a company is better understood as a set of distinct relationships that comprise the whole upper management of the firm and has at its center shareholders. This view suggest that granularity is a key characteristic of the phenomenon under consideration, and that the investigation of the issue must accommodate this complexity to produce meaningful results.

This perspective of recognizing several agency relationships within a firm is not new. Indeed, since Jensen and Mackling (1976) contribution[5] the theory as evolved and has started to recognize the importance of other relationships in describing firms behavior and other market outcomes (Panda and Leepsa, 2017). The theory has now grown complex, explaining several phenomena and encompassing a whole new range of agency relationships within firms, such as the ones between majority and minority shareholders (e.g. monopoly of decision power and earning retention), shareholders and debtholders (e.g. bankruptcy costs and capital structure), management and traders (e.g. insider trading and value signaling), and headquarters and subsidiaries (e.g. decision-making rights distribution and goal achievement). This latter stream of research dealing with multinational corporations also recognizes the possibility of a multiplicity of agency relationships stemming from a unique principal (Hoenen and Kostova, 2015). Overall, modern theory recognizes that a certain subject can be at the same time agent and principal of several distinct relationships.

Combining these insights with a preliminary analysis of remuneration reporting within banks, the original research hypothesis can be divided in four distinct research hypotheses, each dealing with a unique executive group or, equivalently, a unique agency relationship:

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[5] Jensen and Mackling (1976) focused on shareholders-managers relationship. However, their conception that *"most organizations are simply legal fictions which serve as a nexus for a set of contracting relationships among individuals"* already contained the intuition at the base of successive developments.

H$_1$: Members of the Board of Directors in banks whose regulatory capital was more strongly reassessed by the ECB during the 2014 Comprehensive Assessment were more significantly affected by their shareholders in term of compensation

H$_2$: Members of the Supervisory Board in banks whose regulatory capital was more strongly reassessed by the ECB during the 2014 Comprehensive Assessment were more significantly affected by their shareholders in term of compensation

H$_3$: Chief Executive Officers in banks whose regulatory capital was more strongly reassessed by the ECB during the 2014 Comprehensive Assessment were more significantly affected by their shareholders in term of compensation

H$_4$: Key Management Personnel in banks whose regulatory capital was more strongly reassessed by the ECB during the 2014 Comprehensive Assessment were more significantly affected by their shareholders in term of compensation

The distinction between four agency relationships is justified by the different function that each of these organs perform within the corporate governance structure of each firm, which in turn can give rise to specific agency problems. Indeed, each function implies that a distinct relationship is established by shareholders with each organ, which is shaped by the different degree of decision-making power and opaqueness that characterize each of them. As an example, the decision-making power of the CEO on current business activities usually results in a compensation arrangement more sensitive to business performance in respect to the BOD (e.g. stock grants), given the greater need for interest alignment.

To conclude, note that while H$_1$, H$_2$ and H$_3$ refer to common figures within banks' upper management, it is worth clarifying that H$_4$ refer to the category defined in IAS 24 – Related Party Disclosure, who comprise "*those persons having authority and responsibility for planning, directing and controlling the activities of the entity, directly or indirectly*". This definition, although general and possibly subject to discretionary interpretations, defines nonetheless an interesting aggregate who nicely reflect the concept of agent as an individual whose delegated powers enable his actions to influence the utility of the principal.

4.2 – Empirical Strategy

To test empirically these four research hypotheses, two interrelated issues must be tackled: which data should be collected and how they should be analyzed.

The measurement of executive pay is pretty straightforward: it is given by the total compensation reported by the bank in its annual report, once components not linked to the performance of currently operating manager are removed, such as termination payments, social contributions, or payment to former members.

Going forward, the operationalization of the accounting quality construct requires the individuation of an appropriate proxy. This issue has already emerged in Chapter 2: how to investigate shareholder's reaction to accounting quality problem, if in the first place bank's opacity prevent them from having enough information? The answer gave rise to the subsequent Chapter, who was dedicated to the examination of the 2014 ECB Comprehensive Assessment. The analysis revealed that the execution of the CA produced a great amount of data concerning the financial conditions of eurozone banks. In particular, the outputs of two processes constitute interesting candidates as proxies: the adjustments to Common Equity Tier 1 resulting from the Asset Quality Review and the Baseline Scenario Stress Test. In fact, beyond other desirable features common to all data produced by the CA, namely their public nature (i.e. shareholders look exactly at this same variable) and the fact that they are the results of a harmonized and consistent process aimed at producing sound information specifically tailored to each bank (i.e. high data quality), those two proxies have the peculiarity of directly reflecting the quality of each bank accounting evidence.

On one side, the Asset Quality Review was by its very nature aimed at assessing and rectifying the value of banks' balance sheet assets, making it a formidable proxy of accounting quality. This is evident if we look at AQR outcomes, who impacted the same accounts employed in the literature to assess banks' earnings quality, namely LLPs and SGLs. For what concern the BSST, Chapter 3 analysis revealed that it incorporated the AQR results in a simulation exercise performed under what are basically going concern conditions. Even if the employment of certain conservative methodologies (i.e. static balance sheet) do not allow to interpret it purely as a forecast, it can be nonetheless interpreted as the probable future performance of the bank in light of AQR results. As such, it likely contains specific information about the reaction of shareholders to accounting quality signals, given their direct interest in said performance. To conclude, accounting quality can be operationalized by considering the adjustment to CET1 ratio produced by AQR and BSST, measured in basis point value to ease comparability. This also contribute to define the sample, that because of this can include only the 130 credit institutions that took part to the Comprehensive Assessment.

For what concern the control of confounders, the issue turns out to be particularly tricky when considered in light of the method of analysis that that must be employed. Indeed, a proper test

of the research hypotheses should adopt a causal inference approach to data analysis. However, the nature of the data prevent so:

- the fact that CA variables are purely cross-sectional prevent the use of panel data techniques;
- the absence of proper instrumental variables prevent the use of 2SLS;
- even if it characterize itself as an exogenous shock, the complex inclusion criteria of the CA make it difficult to individuate a suitable control group, preventing the use of a Difference-in-Difference approach;

As such, the only feasible approach remain to use multiple regression to explicitly control for possible confounders. However, this approach is subject to endogeneity issues that prevent the causal interpretations of the estimates. Nevertheless, to mitigate the concern of omitted variable bias and increase the quality of the results two tricks will be employed:

- the original list of 130 banks will be streamlined to include only similar institutions
- the regression equations will explicitly control for financial performance variables

The second step accounts for the effect on pay of bank-specific features, such as profitability and size. For what concern the first step, this stem from the concerns related to the very nature of the CA, that is its objective of increasing the stability of the whole eurozone banking system. In fact, as reported in section 3.2.1 this entailed the inclusion of banks not only merely based on their size, but also following other criteria related to their significance for individual Member States. This led to the inclusion of banks very different in term of size, operational complexity and scope of activities, who operates in economies very different from one another. Consequently, in an attempt to mitigate the confounding effect due to country-specific characteristics and at the same time preserve a certain sample size, a clustering technique will be employed to pool similar observations.

Chapter 5 – Empirical Analysis

5.1 – Sampling Methodology

5.1.1 – Cluster Analysis

The 2014 ECB Comprehensive Assessment is the center of the data generating process who spread the information concerning the accounting quality of the major eurozone banks. As such, its scope set the boundaries within which the empirical test of the research hypotheses must be performed. The exercise encompassed 130 banks from 19 European countries, distributed as presented in the following figure.
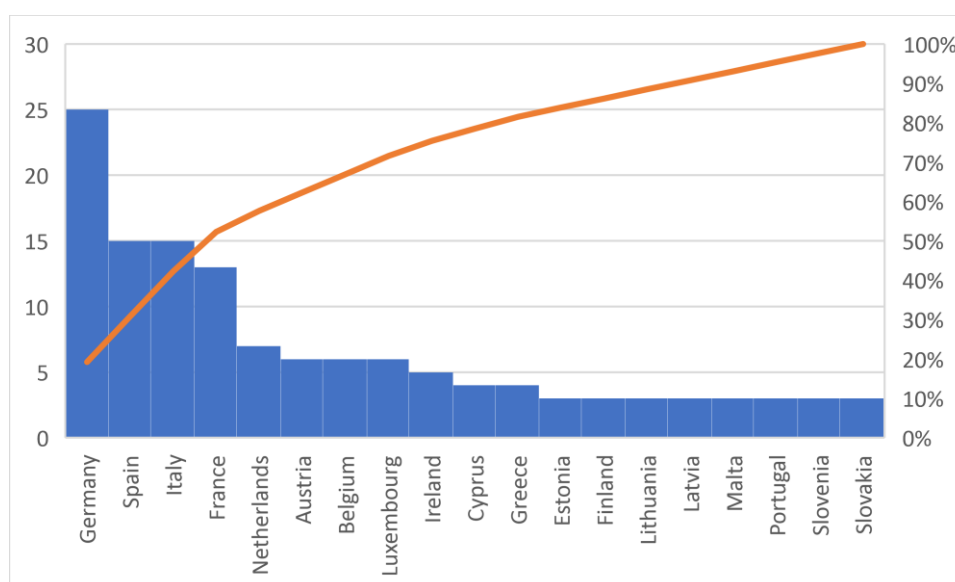
Figure 12 – Participating banks by Member State

Figure 12 highlights an interesting anomaly: more than half of the banks under consideration are located within only four countries, and 8 out of 19 nations have only 3 banks on their roster – the minimum, according to ECB policies (ECB, 2014a). This has important implications for the testing of the research hypotheses, because of its impact on sample composition. Indeed, the examination of the Comprehensive Assessment highlighted that the inclusion criteria adopted by the ECB were not based merely on the significance of the single institution under consideration, but considered also its economic importance for the financial system of the Member State. This is understandable in consideration of the ECB's aim of enhancing the transparency of the banking systems throughout the whole eurozone. However, we must ponder

that within the group of 130 banks there are institutions with significant differences in term of size. In addition to this, the eurozone comprise economies with important structural differences that go beyond the dimension of their financial systems. All these specificities are likely to influence the operating models of each bank (for example, size directly influence organizational complexity and regulatory scrutiny). As such, this list cannot be used as a sampling base.

To reduce the heterogeneity of the sample and mitigate identification problems related to omitted correlated variable bias, the first step to take consist in pooling similar banks to conduct a more focused analysis. Using countries as the unit of analysis, it is possible to use clustering techniques to identify economies more structurally alike, whose observations on local banks can be more safely analyzed jointly.[6]

On Table 2 are reported all the countries that have taken part to the Comprehensive Assessment, with the exclusion of Cyprus, Malta and Luxemburg. Those countries have been excluded for their low economic importance (on the real side), however Luxemburg has been included in the final sample due to its importance as a financial center within the EU. For each country, three variables have been reported, who constitute the dimensions along which the clusters will be created. Those variables are:

- *Average GDP growth for the years 2011, 2012 and 2013*: this variable aims at capturing the economic conditions under which bank operated in the years before the CA;
- *Economic Complexity Index*: this variable aims to capture the structural differences among the economies of each country. This index capture the way in which the knowledge of a country combines to form its productive output, and has been found to correlate strongly with several country characteristics such as corruption, government effectiveness, regulatory quality, rule of law, accountability and political stability (Hausmann, 2011);
- *Total Banks' Assets comprised under the CA*: this variable aims to capture the size and complexity of the financial system of the country.

The clusters are formed by applying the K-Means Algorithm: the number of clusters has been set equal to three, and as seed points Austria, France and Latvia have been chosen. The choice has been done by having regard to the median, maximum and minimum value for the total consolidated assets. Table 3 reports the convergence to the clusters of the observations. After

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[6] Note that the use of countries as UOA is only functional to select a list of more homogeneous institutions on which base the sampling. All other analysis will be performed using microeconomic data referring to individual banks.

the fourth iteration the clusters stabilized and the SSE improved marginally, as such the algorithm has been stopped.

Country	AvgGDP1113	ECI13	Assets
Austria	*1,11*	*1,728*	*4.881*
Belgium	0,99	0,951	7.516
Estonia	3,68	0,684	136
Finland	-0,02	1,575	4.204
France	*0,97*	*1,242*	*67.142*
Germany	1,66	1,846	45.708
Greece	-3,85	-0,210	3.514
Ireland	7,71	1,289	6.052
Italy	-0,58	1,215	22.774
Latvia	*3,54*	*0,478*	*126*
Lithuania	3,79	0,673	160
Netherlands	0,82	0,818	21.549
Portugal	-0,85	0,434	2.235
Slovak Republic	2,51	1,218	212
Slovenia	0,42	1,436	327
Spain	-0,16	0,700	31.149
Max	7,71	1,846	*67.142*
Median	0,98	1,083	*4.543*
Min	-3,85	-0,210	*126*
Table 2 – Country data used for clustering			

Country	Iteration 1	Iteration 2	Iteration 3	Iteration 4
Austria	2	3	3	3
Belgium	2	2	3	3
Estonia	3	3	3	3
Finland	2	3	3	3
France	1	1	1	1
Germany	1	1	1	1
Greece	2	3	3	3
Ireland	2	3	3	3
Italy	2	2	2	2
Latvia	3	3	3	3
Lithuania	3	3	3	3
Netherlands	2	2	2	2
Portugal	3	3	3	3
Slovak Republic	3	3	3	3
Slovenia	3	3	3	3
Spain	2	2	2	2
SSE	1.762.467.962	851.641.400	419.019.687	358.084.171
Table 3 – Clusters evolution				

To form the final list clusters 1 and 2 have been chosen, because they comprise the biggest and most mature economies within the eurozone. Although cluster 1 comprise banks who operated during the relevant period in a moderate-growth environment, contrary to cluster 2 banks who found themselves in less favorable conditions, this is a dimension for which it is easy to control for. As such, the new list should be enough homogeneous to offer meaningful insights.

With the addition of Luxemburg, the final list of institutions subject to sampling comprise 81 banks, amounting to 18.970 billion assets: more than 86% of the assets examined by the ECB during the 2014 Comprehensive Assessment. In fact, the clustering automatically eliminated most of the banks included in the CA scope through criteria other than size, at the origin the distortions. This is a further confirmation of the primary relevance of the banks selected for the analysis, and as such corroborates the goodness of the selection procedure.

5.1.2 – Variables and Data Sources

In relation to the discussion developed in section 4.2, Table 4 offers a list of the variables sampled for each bank contained in the final list. For each dimension is reported a brief description and the data sources used to gather observations. Time-related variables (executive compensation and bank performance) have been gathered for three years: 2013, 2014 and 2015. In case the CEO were also a member of the BOD, his compensation has been deduced from the BOD total amount. Moreover, when enough details were available, from the determination of total compensation for each executive group have been excluded social security, termination payments and post-employment benefits, due to their loose link to performance.

In reference to data collection, the variables concerning accounting quality have been gathered from the templates published in the section of ECB's official site dedicated to the Comprehensive Assessment. On the other side, the data about executive compensation and firm performance have been hand-collected by analyzing the official financial statements published on the internet site of each bank. This distinction is important since it directly affects the nature of the two set of variables. Indeed, accounting quality data are gathered from a common and complete source and, as highlighted in Chapter 3, are the result of a consistent and harmonized process that assure the reliability and comparability of the observations for each bank. On the other hand, executive compensation and bank performance variables do not fully share these desirable properties. Indeed, while performance variables can be considered comparable since

Variable	Description	Source
BOD_CompYY	Board of Directors total compensation in year 20YY, in thousands of euros	FSs
SB_CompYY	Supervisory Board total compensation in year 20YY, in thousands of euros	FSs
CEO_CompYY	Chief Executive Officer total compensation in year 20YY, in thousands of euros	FSs
KMP_CompYY	Key Management Personnel ex IAS 24 total compensation in year 20YY, in thousands of euros	FSs
NetIncomeYY	Net Income in year 20YY, in million euros	FSs
AssetsYY	Total Consolidated Assets in year 20YY, in million euros	FSs
CET1	Ratio between CET 1 and TRWA (CA glossary, ref. A6)	ECB
AQR	Adjustment to CET 1 due to the Asset Quality Review, expressed in basis points	ECB
Base	Adjustment to CET 1 due to the stress test under baseline scenario, expressed in basis points	ECB
Adverse	Adjustment to CET 1 due to the stress test under adverse scenario, expressed in basis points	ECB
Table 4 – Variables observed for each bank in the final list		

concerned with common financial aggregates such as total assets and net income, management pay reporting practices have been observed during sampling to vary widely both within and across countries. Although mitigated by limiting the analysis to similar national economies, this fact poses several issues in relation to data quality. Those issues can be classified in term of:

- *data completeness*: not all banks disclosed compensation data about the whole upper management. For example, while most banks disclosed the compensation of the BOD, only a small fraction did the same with the CEO;

- *data granularity*: there is considerable variation in the level of detail of compensation reporting. This is not only due to cross-country variation in regulatory requirements, but also to firm-specific disclosure policies concerning their annual reports. For example, while some bank's reported compensation data with a high level of detail both in term of composition (i.e. fixed vs. variable) and nature (i.e. share-payments vs. benefits in kind), others disclosed solely aggregate data (e.g. total amount of KMP compensation);

- *data comparability*: this concern the discretion that banks have in defining the boundaries of reporting. For example, while BOD membership is quite straightforward

to determine, the definition of Key Management Personnel ex IAS 24 is less clear. This creates possible problems in term of comparability of similar aggregates.

Accordingly, these problems have several implications for the analysis of the data. The lack of completeness drastically reduce the sample size, limiting the quality of the estimates, while the lack of granularity and comparability may hinder the validity of the conclusions, by making the interpretations of the results less clear. Overall, those caveats must be considered while assessing the results of the analyses.

5.2 – Exploratory Analysis

As stated before, data about executive compensation have been hand-collected by analyzing the annual reports published by each bank on the final list for the years 2013, 2014 and 2015. To this regard, Figure 13 offers an overview of the sampling success rate for each year. In general, the results can be considered satisfactory for what concern BOD members and key management compensation data, with success rates around 50%. Not as good is the collection of data concerning the Supervisory Board, for which only 35% of the banks included in the final list disclosed information about. Finally, delusional is the collection of data about CEOs pay: only 10% of the banks provided this information on their financial reports.
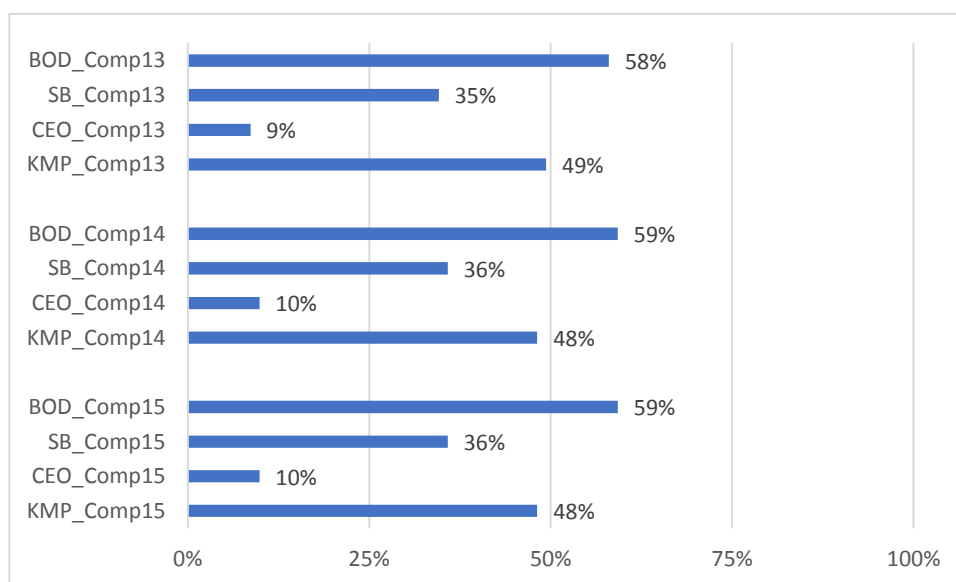

Figure 13 – Sampling success rate

This outcome suggest two considerations. Firstly, in practical terms this low success rate results in low sampling number: this range from 49 observations for the BODs to only 7 for the CEOs. This in turn dictate to exclude CEO data from the analysis from now on, while imposing caution

in the interpretation of the estimates resulting from BOD, SP and KMP data. Unfortunately, this strongly reduce the informativeness of the analysis as it was planned.

Second, it raises the question of what this low success rate means, both from a scientific and from a practical point of view. From the former perspective, it raise the question of what else we are missing with these observations. What if this lower propensity to disclose is symptomatic of other relevant characteristics? For example, the theoretical analysis demonstrated that one of the ways in which self-interested executives extract compensations is through "stealth" transfers (i.e. transfers whose fair value is difficult to value). This surely encompassed undisclosed ones, who would allow to respect the aforementioned "outrage constraint" (Bebchuk and Fried, 2004). This is another caveat to consider while attempting to draw conclusions from the final dataset. In relation to the latter view, this lack of data nonetheless demonstrates how opaque and incomplete is the disclosure of compensation data in European banks, especially if compared with US counterparts (Uhde, 2016). This lack of transparency poses actual problems for shareholders, especially smaller ones who cannot participate to meetings and must rely on annual reports to monitor their investment.

Fortunately, thanks to the EU directive 2017/828 important progresses have been made to this regard. Indeed, this directive introduced the obligation for banks to disclose a detailed report on the remuneration of directors, defined as "*any member of the administrative, management or supervisory bodies of a company [...] the chief executive officer and, if such function exists in a company, the deputy chief executive officer*" as well as "*other persons who perform functions similar to those*". Moreover, the directive imposes a high level of detail, dictating to report on the components and on the relative proportion of fixed and variable remuneration, as well as to disclose other qualitative information concerning remuneration policies. These regulatory interventions will allow to overcome the aforementioned problems concerning completeness and granularity, allowing for dramatic improvements on banks transparency.

Moving ahead, Figure 14 offers four bridge graphs illustrating the evolution of upper management pay within the sampled banks. Excluding CEO data, the other graphs shows that there has been a reduction in the average pay within all other executives groups after the publication of the results of the Comprehensive Assessment (October 2014). Even if this method of analysis does not allow to properly isolate the effects of the CA, its consistency with the research hypotheses formulated in Chapter 4 is reassuring. Something penalized managers, although at this stage it is unclear what caused this. Indeed, we must consider that in that same period countries such as Italy and Spain were still struggling with the effects of the Great Recession. This could have influenced management pay. For example, this decrease in

compensation might partially reflect a negative performance due to the adverse economic conditions prevalent at the time.
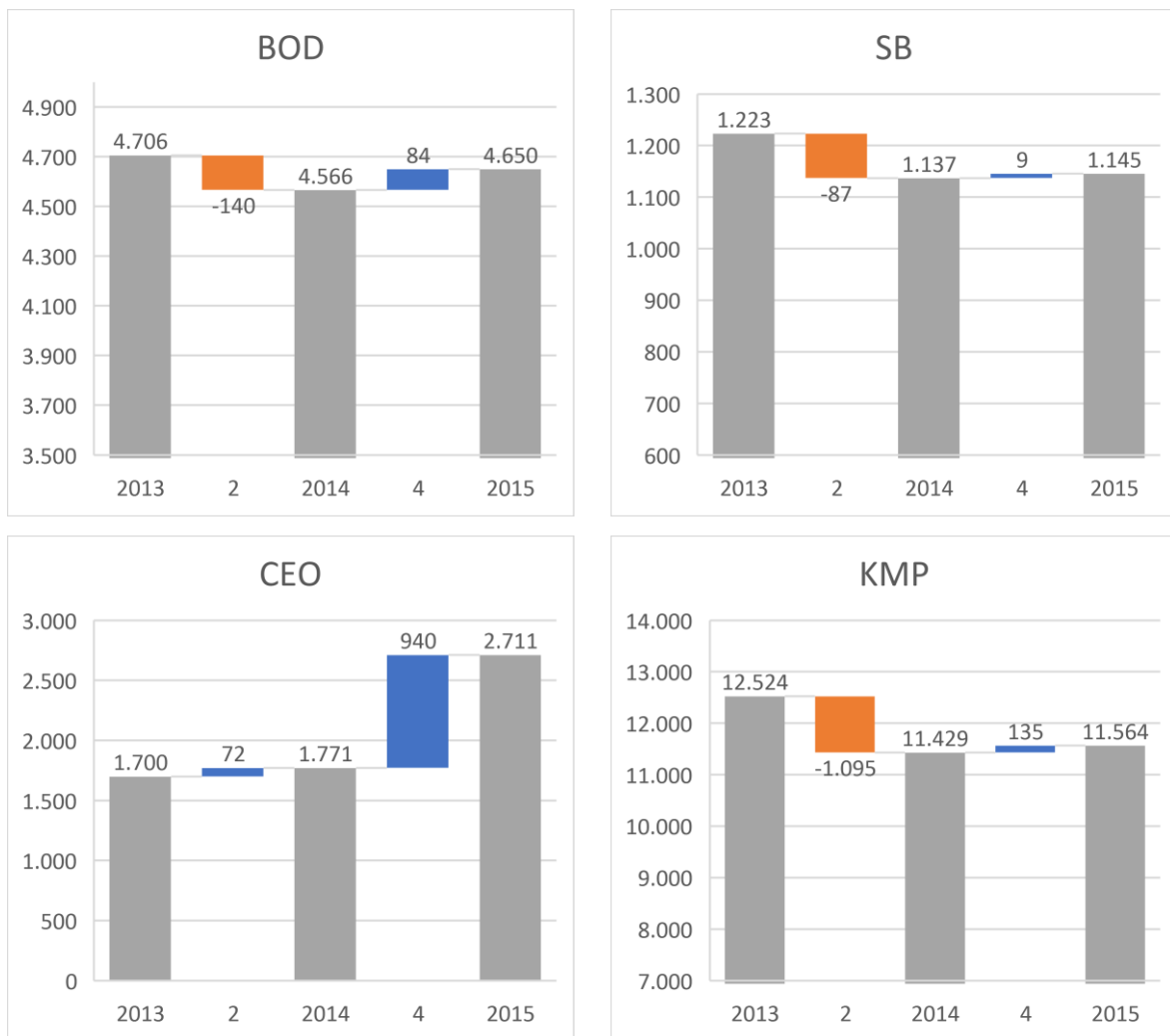
Figure 14 – Executive Compensation Change, 2013-2014

To conclude, for the sake of completeness in the following tables are reported some summary statistics of the data collected.

	NetIncome13	Assets13	NetIncome14	Assets14	NetIncome15	Assets15
Mean	106	315.037	475	331.280	836	321.889
Median	77	81.932	160	88.846	330	93.293
Standard Deviation	2.713	456.471	1.608	490.457	1.990	474.372
Kurtosis	13,72	2,43	6,85	3,18	5,91	3,10
Skewness	-2,81	1,84	0,47	1,97	0,46	1,96
Minimum	-13.865	12.574	-5.434	13.455	-6.772	14.825
Maximum	5.439	1.800.139	6.935	2.077.758	7.334	1.994.193
N	57	57	57	57	57	57
Table 5 - Banks' financial data summary statistics						

	BOD_Comp13	SB_Comp13	CEO_Comp13	KMP_Comp13
Mean	4.706	1.223	1.700	12.524
Median	2.582	557	1.549	5.664
Standard Deviation	6.751	2.436	1.710	15.087
Kurtosis	12,02	22,00	-0,55	5,70
Skewness	3,22	4,53	0,73	2,23
Minimum	119	145	24	1.092
Maximum	36.891	13.000	4.568	72.673
N	47	28	7	40

Table 6 - 2013 executive compensation summary statistics

	BOD_Comp14	SB_Comp14	CEO_Comp14	KMP_Comp14
Mean	4.566	1.137	1.771	11.429
Median	2.190	564	1.379	6.072
Standard Deviation	6.281	2.093	1.600	12.576
Kurtosis	9,34	18,85	0,11	3,28
Skewness	2,86	4,15	1,03	1,86
Minimum	119	0	269	1.106
Maximum	31.710	11.000	4.730	56.019
N	48	29	8	39

Table 7 - 2014 executive compensation summary statistics

	BOD_Comp15	SB_Comp15	CEO_Comp15	KMP_Comp15
Mean	4.650	1.145	2.711	11.564
Median	2.149	507	1.790	5.921
Standard Deviation	5.616	2.118	2.635	12.199
Kurtosis	4,56	17,85	-0,75	1,50
Skewness	2,19	4,04	0,87	1,59
Minimum	120	58	368	192
Maximum	23.914	11.000	7.189	46.000
N	48	29	8	39

Table 8 - 2015 executive compensation summary statistics

	CET1	AQR	Base	Adverse
Mean	14%	-43	-25	-369
Median	11%	-19	-8	-296
Standard Deviation	10%	63	104	338
Kurtosis	21,62	7,50	8,84	12,97
Skewness	4,30	-2,58	-2,01	-3,19
Minimum	5%	-320	-562	-2133
Maximum	76%	0	173	-22
N	81	81	81	81

Table 9 - Banks' CA outcomes summary statistics

5.3 – Hypotheses Testing

5.3.1 – Model Development

To isolate the effects of accounting quality proxies on executive compensation and properly test the research hypotheses, the following models will be estimated:

$$\Delta Comp_{t-1;t} = \alpha_0 + \gamma_1 AQR + \beta_3 Adverse + \beta_4 CET1 + \beta_5 \Delta NI_{t-1;t} + \beta_6 A_{t-1} + \varepsilon$$

$$\Delta Comp_{t-1;t} = \alpha_0 + \gamma_2 Base + \beta_3 Adverse + \beta_4 CET1 + \beta_5 \Delta NI_{t-1;t} + \beta_6 A_{t-1} + \varepsilon$$

$$\Delta Comp_{t-1;t} = \alpha_0 + \gamma_1 AQR + \gamma_2 Base + \beta_3 Adverse + \beta_4 CET1 + \beta_5 \Delta NI_{t-1;t} + \beta_6 A_{t-1} + \varepsilon$$

where

- $\Delta Comp_{t-1;t}$ is the change in management pay from year $t-1$ to year t, obtained as the difference between the sampled compensation data;
- $\Delta NI_{t-1;t}$ is the change in net income from year $t-1$ to year t, obtained as the difference between the sampled net income data;
- A_{t-1} is total assets as reported in year $t-1$;

and all other variables are as defined previously.

Considered the interpretation of AQR and $Base$ as accounting quality proxies, the coefficients of interest are γ_1 and γ_2, who are expected to be positive and statistically significant. Indeed, if the research hypothesis gain empirical support and executive pay is sensitive to signals of accounting quality, a negative (positive) impact of the CA on the supervisory capital should penalize (benefit) the management.

Within the model all the remaining variables have a controlling role, and aim at account for other firm-specific characteristics that might influence executive pay change: $Adverse$ should control for the effect of the outcomes of the adverse scenario stress test, $\Delta NI_{t-1;t}$ should control for the effect of financial performance, A_{t-1} should control for influence of size and complexity, and $CET1$ for the risk appetite of the bank (leverage).

To properly address all the possible agency relationship individuated in Chapter 4, the models will be estimated for each management group identified in the sample. Moreover, from a behavioral perspective it is not clear how much the delay in the shareholders' reaction to the new information is. As such, for each management group the model will be estimated for the

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two periods that immediately followed the Comprehensive Assessment: from 2013 to 2014 and from 2014 to 2015.

To conclude, we note the modeled relationship is a change in compensation. In general, it can be argued that such a change should always occur as a function of another variable, and not happen *a priori*. This can be a performance variable influencing the variable portion (e.g. high profits), or a structural variable influencing the fixed part (e.g. downsizing). In other words, each compensation change should always be motivated by some underlying reason. As such, each model will also be estimated omitting the intercept, to accommodate this theoretical possibility.

5.3.2 – Model Estimation

Tables 10, 11 and 12 present the results of the estimates for each management group, with the exclusion of CEOs due to lack of data. The estimation has been executed through OLS, using the software gretl[7]. Each table reports the estimated coefficients as well as their standard errors in parentheses. Moreover, considered American Statistical Association recommendations on reporting research results (Wasserstein and Lazar, 2016), together with the usual asterisks to indicate the level of statistical significance (one, two and three to indicate 10%, 5% and 1%, respectively), between brackets is reported also the p-value at two digits. Moreover, note that to ease the presentation only one list of explanatory variables has been reported for both year-on-year compensation changes. As such, time related regressors like the assets level and the change in net income are to be interpreted accordingly.

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[7] Version: 2017c

	DeltaBOD_1314						DeltaBOD_1415					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
const	170.5		188.8		169.4		510.7		380.3		480.3	
	(372.7)		(370.8)		(376.5)		(532.6)		(551.0)		(514.7)	
	[0.65]		[0.61]		[0.66]		[0.34]		[0.49]		[0.36]	
AQR	-2.501	-2.713			-2.028	-2.236	13.06**	12.62**			15.61***	15.23**
	(4.066)	(4.001)			(4.261)	(4.194)	(5.798)	(5.774)			(5.744)	(5.721)
	[0.54]	[0.50]			[0.64]	[0.60]	[0.03]	[0.03]			[0.0096]	[0.01]
Base			1.435	1.483	1.101	1.109			4.927	5.046	7.051*	7.148**
			(2.521)	(2.497)	(2.640)	(2.614)			(3.686)	(3.659)	(3.521)	(3.514)
			[0.57]	[0.56]	[0.68]	[0.67]			[0.19]	[0.17]	[0.05]	[0.05]
Adverse	-0.2466	-0.2893	-0.8556	-0.9443	-0.5228	-0.5673	-1.439	-1.656	-0.7899	-1.007	-2.841	-3.064*
	(1.296)	(1.281)	(1.278)	(1.255)	(1.468)	(1.450)	(1.689)	(1.672)	(1.725)	(1.686)	(1.775)	(1.757)
	[0.85]	[0.82]	[0.51]	[0.46]	[0.72]	[0.70]	[0.40]	[0.33]	[0.65]	[0.55]	[0.12]	[0.09]
CET1	-1856	-1365	-2179	-1639	-2108	-1622	1364	2728	-130.8	887.6	355.2	1623
	(3004)	(2779)	(3061)	(2846)	(3094)	(2871)	(4124)	(3867)	(4306)	(4020)	(4015)	(3773)
	[0.54]	[0.63]	[0.48]	[0.58]	[0.50]	[0.58]	[0.74]	[0.48]	[0.98]	[0.83]	[0.93]	[0.67]
DeltaNI_1y1Y	0.009388	0.01205	0.0008029	0.002979	0.007655	0.01029	0.5492***	0.5607***	0.4721**	0.4824***	0.5560***	0.5670***
	(0.07691)	(0.07596)	(0.07574)	(0.07495)	(0.07781)	(0.07683)	(0.1758)	(0.1753)	(0.1793)	(0.1776)	(0.1699)	(0.1692)
	[0.90]	[0.88]	[0.99]	[0.97]	[0.92]	[0.89]	[0.0032]	[0.0026]	[0.01]	[0.0095]	[0.0022]	[0.0017]
Assets1y	-0.0005635	-0.0004717	-0.0006354	-0.0005385	-0.0005850	-0.0004940	-0.001858***	-0.001612***	-0.001574**	-0.001398**	-0.001945***	-0.001715***
	(0.0004563)	(0.0004059)	(0.0004473)	(0.0004013)	(0.0004638)	(0.0004133)	(0.0005969)	(0.0005382)	(0.0006031)	(0.0005431)	(0.0005782)	(0.0005221)
	[0.22]	[0.25]	[0.16]	[0.17]	[0.21]	[0.24]	[0.0033]	[0.0045]	[0.01]	[0.01]	[0.0017]	[0.0021]
n	47	47	47	47	47	47	48	48	48	48	48	48
Adj. R^2	-0.0563	-0.0338	-0.0577	-0.0364	-0.0781	-0.0544	0.2359	0.2384	0.1785	0.1896	0.2869	0.2901
lnL	-402.8	-402.9	-402.8	-402.9	-402.7	-402.8	-428.9	-429.4	-430.7	-430.9	-426.7	-427.2

Table 10 – Board of Directors Change in Compensation, 2013-2014 and 2014-2015, OLS estimates

	DeltaSB_1314						DeltaSB_1415					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
const	-72.47		-66.94		-69.10		16.21		35.59		32.86	
	(151.4)		(153.2)		(156.2)		(91.20)		(88.23)		(89.74)	
	[0.64]		[0.67]		[0.66]		[0.86]		[0.69]		[0.72]	
AQR	0.7191	0.6506			0.8233	0.7963	0.1200	0.1371			0.5276	0.5491
	(1.754)	(1.719)			(1.904)	(1.868)	(0.9922)	(0.9682)			(1.007)	(0.9871)
	[0.69]	[0.71]			[0.67]	[0.67]	[0.91]	[0.89]			[0.61]	[0.58]
Base			0.02127	0.08936	0.1825	0.2474			0.7894	0.7561	0.8742	0.8470
			(1.030)	(1.001)	(1.114)	(1.084)			(0.5602)	(0.5447)	(0.5915)	(0.5761)
			[0.98]	[0.93]	[0.87]	[0.82]			[0.17]	[0.18]	[0.15]	[0.15]
Adverse	-0.2658	-0.1469	-0.1251	-0.03347	-0.2977	-0.1976	0.2977	0.2731	0.2922	0.2456	0.2085	0.1622
	(0.6893)	(0.6321)	(0.6015)	(0.5538)	(0.7315)	(0.6828)	(0.3401)	(0.3046)	(0.2927)	(0.2644)	(0.3374)	(0.3072)
	[0.70]	[0.82]	[0.84]	[0.95]	[0.69]	[0.78]	[0.39]	[0.38]	[0.33]	[0.36]	[0.54]	[0.60]
CET1	-258.8	-227.8	-191.5	-171.5	-275.0	-251.7	774.6	769.9	800.0	788.5	802.5	792.1
	(1383)	(1358)	(1378)	(1353)	(1418)	(1391)	(719.6)	(705.0)	(692.0)	(679.7)	(702.7)	(689.3)
	[0.85]	[0.87]	[0.89]	[0.90]	[0.85]	[0.86]	[0.29]	[0.29]	[0.26]	[0.26]	[0.27]	[0.26]
DeltaNI_1y1Y	-0.04365	-0.04379	-0.04243	-0.04267	-0.04386	-0.04407	-0.02842	-0.02631	-0.03682	-0.03218	-0.03418	-0.02981
	(0.02754)	(0.02707)	(0.02748)	(0.02699)	(0.02820)	(0.02768)	(0.03277)	(0.02995)	(0.03134)	(0.02866)	(0.03222)	(0.02938)
	[0.13]	[0.12]	[0.14]	[0.13]	[0.14]	[0.13]	[0.39]	[0.39]	[0.25]	[0.27]	[0.30]	[0.32]
Assets1y	0.0001201	7.225e-05	0.0001291	8.419e-05	0.0001171	7.111e-05	1.503e-05	2.950e-05	-3.021e-06	2.922e-05	-6.334e-06	2.319e-05
	(0.0002300)	(0.0002036)	(0.0002300)	(0.0002020)	(0.0002360)	(0.0002080)	(0.0001458)	(0.0001185)	(0.0001407)	(0.0001138)	(0.0001430)	(0.0001160)
	[0.61]	[0.73]	[0.58]	[0.68]	[0.63]	[0.74]	[0.92]	[0.81]	[0.98]	[0.80]	[0.97]	[0.84]
N	28	28	28	28	28	28	30	30	30	30	30	30
Adj. R^2	-0.0969	-0.0467	-0.1053	-0.0528	-0.1477	-0.0917	-0.1036	-0.0595	-0.0199	0.0155	-0.0517	-0.0124
lnL	-206.3	-206.4	-206.4	-206.5	-206.3	-206.4	-205.1	-205.1	-203.9	-204	-203.7	-203.8

Table 11 – Supervisory Board Change in Compensation, 2013-2014 and 2014-2015, OLS estimates

	DeltaKMP_1314						DeltaKMP_1415					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
const	906.0		4276		3017		-4300		1984		-1709	
	(2989)		(3121)		(3562)		(3444)		(3058)		(3790)	
	[0.76]		[0.18]		[0.40]		[0.22]		[0.52]		[0.66]	
AQR	-10.66	-13.40			-11.41	-17.48	-22.32	-9.790			-22.50	-18.57
	(15.24)	(12.11)			(15.22)	(13.36)	(14.47)	(10.50)			(14.20)	(11.06)
	[0.49]	[0.28]			[0.46]	[0.20]	[0.13]	[0.36]			[0.12]	[0.10]
Base			-14.06	-2.300	-14.52	-8.304			-16.18	-12.01	-16.32	-18.53*
			(13.30)	(10.29)	(13.40)	(11.17)			(11.06)	(8.927)	(10.82)	(9.527)
			[0.30]	[0.82]	[0.29]	[0.46]			[0.15]	[0.19]	[0.14]	[0.06]
Adverse	4.531	4.649	8.337	3.458	9.715	7.771	-2.699	-5.641	-1.149	-2.125	2.856	2.679
	(4.011)	(3.940)	(5.922)	(4.791)	(6.238)	(5.776)	(4.472)	(3.833)	(5.257)	(4.995)	(5.728)	(5.645)
	[0.27]	[0.25]	[0.17]	[0.48]	[0.13]	[0.19]	[0.55]	[0.15]	[0.83]	[0.67]	[0.62]	[0.63]
CET1	-8139	-2565	-2.298e+04	-1492	-1.511e+04	875.5	2.336e+04	-1.484e+04	-1.918e+04	-4689	1.325e+04	-186.3
	(2.212e+04)	(1.214e+04)	(2.031e+04)	(1.307e+04)	(2.299e+04)	(1.306e+04)	(3.353e+04)	(1.383e+04)	(2.723e+04)	(1.544e+04)	(3.358e+04)	(1.528e+04)
	[0.72]	[0.83]	[0.27]	[0.91]	[0.52]	[0.95]	[0.49]	[0.29]	[0.49]	[0.76]	[0.70]	[0.99]
DeltaNI_1y1Y	0.2148	0.2307	0.1698	0.1530	0.2382	0.2654	-1.065***	-1.007***	-0.8978**	-0.8638**	-1.089***	-1.074***
	(0.2825)	(0.2740)	(0.2658)	(0.2688)	(0.2826)	(0.2796)	(0.3506)	(0.3504)	(0.3299)	(0.3230)	(0.3444)	(0.3386)
	[0.45]	[0.41]	[0.53]	[0.57]	[0.41]	[0.35]	[0.0046]	[0.0070]	[0.01]	[0.01]	[0.0034]	[0.0033]
Assets1y	-0.001470	-0.001261	-0.001867	-0.001337	-0.001485	-0.0009903	0.0005065	-6.276e-06	-0.0001777	-9.200e-05	0.0004950	0.0003315
	(0.001667)	(0.001498)	(0.001573)	(0.001544)	(0.001663)	(0.001551)	(0.001292)	(0.001235)	(0.001221)	(0.001204)	(0.001267)	(0.001200)
	[0.38]	[0.41]	[0.24]	[0.39]	[0.38]	[0.53]	[0.70]	[0.99]	[0.89]	[0.94]	[0.70]	[0.78]
n	40	40	40	40	40	40	39	39	39	39	39	39
Adj. R^2	-0.0282	0.0700	-0.0098	0.0388	-0.0230	0.0580	0.1877	0.1751	0.1821	0.1968	0.2180	0.2375
lnL	-395.1	-395.1	-394.7	-395.8	-394.4	-394.8	-377.4	-378.3	-377.5	-377.8	-376.1	-376.2

Table 12 – Key Management Personnel Change in Compensation, 2013-2014 and 2014-2015, OLS estimates

5.3.3 – Discussion

In the previous chapter four agency relationship have been identified and, in consideration of the previous theoretical elaborations, four research hypotheses have been advanced. These research hypotheses conceived in the role of distinct agents directors, supervisors, CEOs, and key managers, and concerned the possible effect that signals of low accounting quality can have on their payoffs. Unfortunately, the incompleteness of the data collected made impossible to test H_3, regarding shareholders-CEO relationship. For what concern the three remaining hypotheses, they have been tested by estimating through multiple regression the impact that accounting quality signals had on the evolution of each of the remaining executive groups' remuneration.

The first thing that can be noticed is that all the models estimated to explain the change in compensations from 2013 to 2014 gave no statistically significant results. This outcome is unexpected. Indeed, our exploratory analysis revealed a generalized decrease in pay across all three relevant executive groups from 2013 to 2014, suggesting this to be the relevant period (Figure 14). A possible explanation could be given by the timing of the information spread. The results of the 2014 Comprehensive Assessment have been published only in October, and maybe shareholders haven't had the time to properly assess and act on the information. Indeed, we must consider that the modification of compensation arrangements is not an easy task, likely requiring the organization of an important number of equity holders to gain enough power during a shareholder meeting. Even in the case whereby a compensation committee has enough power (and willingness) to directly act and propose a pay reduction the process is likely to take some time. Moreover, in any case the effects are not necessarily instantaneous, but might manifest in the following period (i.e. the modification take effect from the following period). All this add to the delay, and make the results more plausible.

For what concern the change in compensation from 2014 to 2015, Table 10 present the result of the testing of H_1, concerning the shareholders-BOD agency relationship. In this case both proxies presented statistically significant coefficients: AQR is strongly significant in all four model specifications (p-values: 0,0296; 0,0344; 0,0096; 0,0109), while $Base$ is also significant in the two specifications dealing with the most "complete" model (p-values: 0,0519; 0,0483). In all cases, the sign of the coefficients is positive, confirming the research hypothesis: stronger has been the ECB adjustment to CET1 due to the Comprehensive Assessment, higher the penalty suffered by directors. To this regard, particularly notable is the behavior of the adjustment to CET1 due to the Asset Quality Review: of the two proxies this one is the most

informative due to the nature of the exercise from which it originated, which was specifically aimed at rectifying the carrying value of banks' assets.

In relation to the magnitude of the coefficients, we note that in the complete model an adjustment of one basis point as a result of the AQR translated, on average, in a reduction of directors' total compensation of 15.600 euros. For the baseline scenario stress test, each basis point reduced BOD compensation of around 7.000 euros. Considering that the average bank suffered a reduction of 43 and 25 b.p. for each exercise (Table 9), the average Board experienced a decrease in pay of around 845.800 euros, amounting to a reduction of almost 19% in respect to 2014 levels (Table 7). To widen the perspective, Figure 15 offers a slightly deeper analysis. The sum of AQR and BSST rectification has been divided between positive and negative values, and in turn each distribution has been divided in half. The resulting four distributions constitutes the representation of the total effect of the CA conceptually divided between high-negative, negative, positive and high-positive rectifications on CET1 ratio. In turn, the median values of AQR and $Base$ for each distribution have been used to calculate the *ceteris paribus* impact of the rectifications on the average BOD compensation for each category of banks. The analysis help to furtherly appreciate how material accounting quality effects can be on executive pay, once other variables are held constant.

Overall, the size of the effect allows to conclude that the results are not only statistically significant, but also economically significant. Overall, H_1 is accepted: coherently with the shareholder value theory directors are sanctioned when signals of low accounting quality emerge, although the effect may take some time to manifest.

In relation to H_2, Table 11 do not show any statistically significant coefficients for the two accounting quality proxies considered. As such, the hypothesis is not verified: the members of the Supervisory Board are not sensible to accounting quality signals. Actually, an examination of the coefficients of control variables reveals that supervisors pay is not sensible to any of the variables considered. This is reasonable, considered that they lack the power to materially influence firm performance. However, the fact that they are not influenced by signals of accounting quality is puzzling, considered their supervisory powers sometimes encompass also the control of financial reporting (as in Italy with the "Collegio Sindacale").
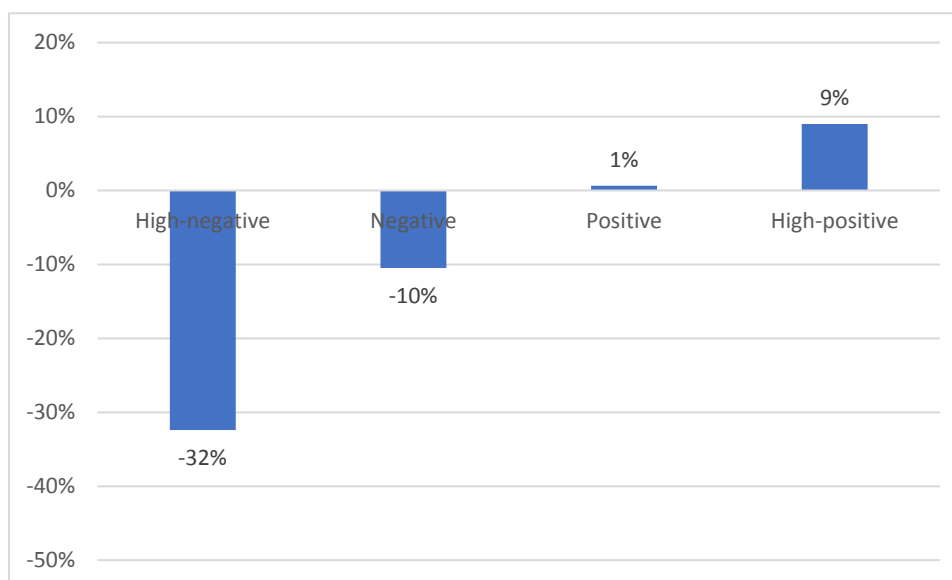
Figure 15 – Ceteris paribus effect of accounting quality signals on representative BODs

Finally, the results of the test of H4 in Table 12 are puzzling. On one side, model 6 presents a statistically significant coefficient for the proxy $Base$ (p-value 0,0603), which would suggest that there is indeed an effect. However, the coefficient is negative. This is apparently inconsistent, because it would imply that not only Key Management Personnel are not sanctioned when signals of low accounting quality emerge, but on the contrary their compensation increases. However, this contradiction can be easily explained by referring to the rent extraction view. As recalled few pages before, one of the tenets of the theory is that self-interested managers maximize their pay extraction under an outrage constraint: they cannot attract too much attention. One way in which they can conceal their activities is by exploiting accounting discretion. For example, take the case of the manager that is compensated as a linear function of net income. If the manager has the possibility to influence not only the performance, but also the measurement of the performance, it can increase his payoff by gaming the system. In the case of banking, an easy way to do so is by undervaluing the loan loss provision.

This explanation has exciting implications because, in light of previous conclusions concerning shareholders-BOD dynamics, would imply that the principal-agent relationships within banks governance systems are asymmetrical (i.e. shareholders are at the same time informed and uninformed principals) This would be consistent with the view expressed by Edmans et al (2017), who do not consider the shareholder value view and the rent extraction view as mutually exclusive. However, even if exciting, this theory rest on a fragile empirical basis. Indeed, a closer look at table 12 reveals two anomalies. The first is the absence of the intercept. Although theoretically possible, the reasons for excluding it are not much compelling. This is relevant, because the exclusion of the intercept could bias the estimation of coefficients, making the

results unreliable. This view is corroborated by a second anomalous results: the negative coefficient of the change in net income. Not even the rent extraction theory can justify this negative sign, which is likely to be an indicator of model misspecification. In other words, the evolution of the Key Management Personnel compensation is a function of other relevant variables not included in the model. Moreover, as stated before, the measurement of KMP has been observed to be problematic due to the discretion that can be applied in defining this aggregate, and as such doubt can also be cast in relation to the goodness of the data employed. In light of this, the evidence concerning H_4 must be considered inconclusive.

Conclusions

Financial reporting constitute a pivotal tool to inform investors and other stakeholders of the economic performance of the firm, and consequently on the use that executives made of the resources entrusted to them. However, the process of financial reporting is itself in the hands of the management. This rise the problem of the quality of the accounting evidence, generally intended as the decision-usefulness from the point of view of a certain user, as well as of if and how the principal is able to leverage the agent's payoff to induce him to fairly represent his performance. A recent example is given by the Veneto Banca crack, who allegedly manipulated financial reporting to inflate share price.

Moving from these considerations, this thesis explored the theoretical and empirical research at the intersection of the fields of executive compensation and accounting quality, with a specific focus on the banking industry. The analysis of the literature highlighted the complex nature of management pay, oscillating between being a tool of value maximization for shareholders and rent extraction for managers, as well as its relationship with accounting quality, who at the same time influence and is influenced by management pay. Subsequently, the literature concerned with the banking industry added to the picture the issue of banks' opacity.

The need for an independent and reliable source of information prompted the analysis of the 2014 Comprehensive Assessment, who under the responsibility of the ECB aimed at strengthening the eurozone banking system by improving the transparency of credit institutions' balance sheets. This exercise proved to be a valuable source of data, offering the possibility to test shareholders reaction to third-party signals of accounting quality. Consequently, in light of the previous theoretical elaboration, four research hypotheses have been elaborated. These hypotheses aimed at testing the nature of the agency relationship existing between shareholders and four group of executives, composing the upper management of the firm, to see if shareholders are indeed able to manage information asymmetries through agents' payoff.

Finally, data about executive compensation and accounting quality have been gathered to test the empirical validity of those hypotheses. Evidence demonstrated that the compensation of the members of the Board of Directors is sensitive to signals of accounting quality. Even if delayed, the magnitude of the pay reduction is sensible and averages around 20% of the preceding year's. However, the Supervisory Board members demonstrated to not be influenced by those same

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signals, while the evidence on CEOs and Key Management Personnel proved inconclusive due to issues with data quality.

Overall, the value added by the research comes from three sources. First, most studies on accounting quality and executive compensation are based on US or UK firms, while this study takes a European perspective. Second, most studies on accounting quality use indirect proxies derived by the researcher (e.g. abnormal accruals, earning response coefficient, etc.), while this study use first-hand data to operationalize the construct. This has the tremendous advantage of testing shareholders reaction on and indicator who was specifically produced for them by and independent third party through an analytical and detailed process tailored to banks' specificities. Third, the originality of the research, who address a research gap within the banking literature concerning the effects of accounting quality on executive pay.

However, the study also suffers from several limitations. The firsts relates to the low quality of the data employed, who derives from their incompleteness as well as their lack of granularity and comparability. The lack of granularity (low level of detail) and comparability (low consistency in aggregate definition) directly affect the meaningfulness of the estimates, while the incompleteness (low sampling success rate) reduced the sample size and introduces the possibility of selection bias. The problem of selection bias is furtherly worsened by the use of the CA. Indeed, while the information it provided are of great value, the exercise nonetheless imposed strict boundaries on the sample of banks. The list of 130 institutions subject to the CA was formed by applying criteria functional to the exercise; the effects of this non-random selection are difficult to assess. This impose caution on the generalizability of the results.

In addition to this, even the regressions concerning BOD members in Table 10 for the period 2014-2015, and containing the most promising results, are not free of problems. In fact, the negative coefficients of the control variable A_{t-1} (total assets) is expected to be positive, given the positive association between firm size and management pay. This might be an indicator of model misspecification. Finally, problematic is also the data analysis technique employed. In fact, although several remedies have been adopted to properly isolate the effect of accounting quality on management pay (clustering of similar economies, introduction of explicit controls), the multiple regression is by itself still subject to endogeneity, who prevent an interpretation of the coefficients beyond the simple correlation.

To conclude, it must be kept in mind that the conclusions concerning the research hypotheses are strongly related to the proxies used to test them. Both AQR and BSST basis point adjustment to CET1 ratio are valuable tools, because of they represent indicators specifically built and published to serve stakeholders' interests. This make them perfect to test investors' reaction.

However, this major virtue also reduce the generalizability of the results. In fact, would shareholders react in the same way in the absence of this public information? Would they react at all? In this sense, the nature of the information is likely to matter, however it is unclear to which extent.

In consideration of this, future research on the subject should concentrate on the refinement of the research design, in an attempt to improve the quality of the data and enable the use of stronger research tools. Moreover, a diverse set of proxies should be employed, to understand how their different nature modify the observed relationship between management remuneration and accounting quality.

Main Text
27.735 words
83 pages

Appendix – Banks Final List

Bank	C	S	Bank	C	S
Aareal Bank AG	GE	x	Banque Centrale de Compensation	FR	
Deutsche Apotheker- und Ärztebank eG	GE	x	BNP Paribas	FR	x
Bayerische Landesbank	GE	x	Groupe BPCE	FR	x
Commerzbank AG	GE	x	BPI France	FR	x
Deutsche Bank AG	GE	x	Groupe Crédit Agricole	FR	x
DekaBank Deutsche Girozentrale	GE	x	Groupe Crédit Mutuel	FR	
DZ Bank AG	GE	x	C.R.H.	FR	
HASPA Finanzholding	GE		HSBC France	FR	
HSH Nordbank AG	GE	x	La Banque Postale	FR	x
Münchener Hypothekenbank eG	GE	x	Banque PSA Finance	FR	
Hypo Real Estate Holding AG	GE		RCI Banque	FR	
IKB Deutsche Industriebank AG	GE	x	Société de Financement Local	FR	
KfW IPEX-Bank GmbH	GE	x	Société Générale	FR	x
Landesbank Berlin Holding AG	GE		Banco Popolare - Società Cooperativa	IT	x
Landesbank Baden-Württemberg	GE		Banca Popolare Dell'Emilia Romagna	IT	x
Landesbank Hessen-Thüringen Girozentrale	GE		Banca Popolare Di Milano	IT	x
Landeskreditbank BWF	GE		Banca Popolare di Sondrio	IT	x
Landwirtschaftliche Rentenbank	GE	x	Banca Popolare di Vicenza	IT	x
Norddeutsche Landesbank-Girozentrale	GE	x	Banca Carige S.P.A.	IT	x
NRW.Bank	GE	x	Credito Emiliano S.p.A.	IT	x
SEB AG	GE		Banca Piccolo Credito Valtellinese	IT	x
Volkswagen Financial Services AG	GE	x	Iccrea Holding S.p.A	IT	x
Wüstenrot Bausparkasse AG (W&W)	GE	x	Intesa Sanpaolo S.p.A.	IT	x
Wüstenrot Bank AG Pfandbriefbank	GE		Mediobanca	IT	x
WGZ Bank AG	GE		Banca Monte dei Paschi di Siena S.p.A.	IT	x
Banco Financiero y de Ahorros, S.A.	ES	x	Unione Di Banche Italiane SCPA	IT	x
Banco Bilbao Vizcaya Argentaria, S.A.	ES	x	UniCredit S.p.A.	IT	x
Bankinter, S.A.	ES	x	Veneto Banca S.C.P.A.	IT	x
Banco Mare Nostrum, S.A.	ES		Banque et Caisse d'Epargne de l'Etat	LU	x
Banco de Sabadell, S.A.	ES		Clearstream Banking S.A.	LU	
Cajas Rurales Unidas	ES	x	Precision Capital S.A.	LU	
Catalunya Banc, S.A.	ES		RBC Investor Services Bank S.A.	LU	x
Caja de Ahorros y M.P.	ES	x	State Street Bank Luxembourg S.A.	LU	
Kutxabank, S.A.	ES	x	UBS (Luxembourg) S.A.	LU	
Caja de Ahorros y Pensiones de Barcelona	ES		ABN Amro Bank N.V.	NL	x
Liberbank, S.A.	ES	x	Bank Nederlandse Gemeenten N.V.	NL	x
NCG Banco, S.A.	ES	x	ING Bank N.V.	NL	x
Banco Popular Español, S.A.	ES	x	Nederlandse Waterschapsbank N.V.	NL	x
Banco Santander, S.A.	ES	x	Coöperatieve Centrale R.-B.	NL	x
Unicaja Banco, S.A.	ES	x	The Royal Bank of Scotland N.V.	NL	x
			SNS Bank N.V.	NL	x

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