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Determinants and Consequences of Executive Compensation

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To Giulia and Francesco

To my parents

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Chapter 1
Executive Compensation: A Framework for Analysis

This chapter provides an introduction to the topic of executive compensation and generates a framework of analysis for the next chapters. Specifically, we first introduce executive compensation as a corporate governance problem and discuss the role of regulation in setting compensation policies. Next, we discuss in detail the different components of compensation plans. Finally, emphasis is given to the importance of aligning performance goals and incentives with a systemic approach to executive compensation.

Executive compensation, regulation, disclosure, corporate governance, incentives, performance goals

Incentive compensation as a corporate governance issue

Incentive compensation is a central concern in the relationship between the Chief Executive Officer (CEO) and the board of directors and between the CEO and shareholders. Indeed, on one hand shareholders want compensation plans with a great deal of performance-based volatility to reduce agency costs and align their interests with those of the top executives, on the other hand, managers are risk adverse and seek less volatility in their compensation schemes. The board of director has to resolve this conflict on behalf of the shareholders, and this makes executive compensation decisions a key issue that has been widely studied in the corporate governance literature.

The classical theoretical framework used to study compensation issues is the agency theory (Jensen and Meckling, 1976). The agency theory investigates the relations between an individual – the principal – that delegates some tasks to another individual – the agent – that should act in such a way to maximize

the interests of the former. The relation between agent and principal is based on trust and it is characterized by the following elements (Jensen and Meckling 1976; Melis et al. 2010):

- imperfect alignment of interests between agent and principal,
- behaviors put in place by the agent and the principal that maximize their own interests,
- presence of asymmetric information,
- different degrees of risk aversion between principal and agent.

The presence of the above-mentioned elements might cause conflicts between the agent and the principal and the goal of the agency theory is to mitigate these conflicts by using optimal contracts (Melis et al. 2010).

Over the years, three factors have contributed to the increased interested towards remuneration policies of top executives. First, we have observed an escalation in the top executive compensation, especially in the period immediately before the 2007-2008 financial crisis. In 2006, right before the financial crisis, in the U.S. the average CEO pay was over 400 times larger than the average worker pay (Monks and Minow, 2011). After the financial crisis the pattern has not changed since in 2013 CEOs of S&P500 firms have received on average a compensation of USD 11.7 million that is equal to 330 times the average compensation of the employees in the same companies (Zattoni, 2015). Second, in the same years in which executive compensation was reaching record levels, the perception that high executive compensation was coupled with layoffs, plant closing, and corporate downsizing started to become more and more diffused (Monks and Minow, 2011). Finally, due to the bull market of the 1990s the value of the CEO's restricted stock and stock options testified an enormous increase (Monks and Minow, 2011). The consequence is that executive compensation started to be under scrutiny and to be viewed as an investment whose returns should be calculated as for any other investment. Although the above-mentioned trends have been more pronounced in the U.S., they also involve Europe, as discussed in Del Linz (2012). Importantly, literature on corporate governance moved from studying US firms only to investigating the compensation structure of European firms (Ferrucci et al., 2016).

In this line, Barontini and Bozzi (2009) investigate the relationships among corporate ownership, the level of board compensation, and firms' future performance within Italian listed companies. They document that excess compensation is never positively related to future performance and for founder family firms it is associated with smaller board size, higher proportion of family members on the board, and lower future performance. Overall, this evidence is consistent with a rent extraction hypothesis, and it suggests that some con-

trol mechanisms and an increase in transparency of executive compensation schemes could be appropriate. Results consistent with a rent-extraction perspective are also documented in Melis et al. (2010). The authors, by using Italian non-financial listed firms as a research setting, show that board independence has a positive influence on stock option design and that – more in general - stock option designs are not fully explained by optimal-contracting theory.

Regulation and compensation

In this debate a key issue relates to the role that regulators should play in setting standards and rules concerning executives' remuneration policies. In the wave of the financial scandals of early 2000s and the financial crisis, regulators started to play a more predominant role on executive compensation. An example is the introduction of the say-on-pay vote in 2010 in the U.S. that (among other things) requires the proxy statement to include - at least once every three years - a separate resolution subject to shareholders' vote to approve the compensation of executives. Moreover, starting 2010, U.S. companies must disclose the median of the total annual compensation of all employees, the total annual compensation of the CEO and the ratio of the latter to the former. In the view of the regulator, this should allow a closer scrutiny of executive compensation policies and avoid abuses. Readers interested in gaining deeper knowledge on the role of regulators in setting executive compensation will find in Artiaco (2013) a useful reference.

Marchetti and Stefanelli (2009) support the idea of a role for regulators in promoting and spreading good practices in executive compensation. Specifically, Marchetti and Stefanelli (2009) suggest that remuneration policies adopted by companies should be linked to practices on corporate governance useful for helping outsiders to contribute confidently to their work in the board.

It is worth to notice that an intervention of the regulator in decisions that relate to executive compensation is not necessary considered to be the most appropriate and desirable approach. In this line, Barontini et al. (2016) analyze the relationship between conformity to executive remuneration standards, corporate ownership, and the level and structure of CEO compensation for large European listed companies. They find that controlled corporations conform to executive remuneration standards less than widely held firms. They also show that weaker compliance is associated with lower CEO pay and more cash-based incentive structures. They conclude that different policy implications depend on whether the conformity gap reflects a lower need for managerial incentives and that regulators should abstain from increasing the level of enforcement of executive remuneration standards.

In the debate on the role that regulation should play in executive compensation practices, not only the level and composition of executive compensation is important but also its disclosure and the level of transparency used by companies to communicate how and how much their executives are paid. From this perspective, all communication channels activated by a firm contribute to define an image of the company that affects an array of different stakeholders, inducing them to have a more favorable attitude towards the firm (Coda 1991, Giusepponi, 2003). In a study of Italian listed companies, Giorgino et al. (2003) build a disclosure index that specifically looks at the transparency of information of executive compensation and find that firms with larger boards have better levels of disclosure. Moreover, they find that a larger number of independent directors not necessarily translates into less opaque disclosure and document an interesting variation across industries. These results are important because they highlight how finding documented in the U.S. not necessarily apply to other institutional settings. Findings in Zattoni and Minichilli (2009) have also implications in terms of disclosure practices on executive compensation. Specifically, the authors study the diffusion and the technical aspects of equity incentive plans adopted by Italian listed companies and recommend policymakers to improve the disclosure rules about these plans.

The structure of executive compensation

The key decision the board must take with respect to setting executive compensation is not (only) the total amount of compensation to grant to each top executive, but also how to design executives' compensation package. The reader will find in Murphy (1999) and Di Pietra (2012) a detailed description of the different compensation components that we are going to quickly illustrate in the following. Broadly speaking, the compensation plan of managers is made by four components:

- Base salary,
- Annual bonus tied to accounting performance,
- Stock options and restricted stocks (equity compensation), and
- Long-term incentive plans (multi-year accounting-based performance plans).

The base salary represents the fixed part of the remuneration, and it is usually determined through a competitive "benchmarking" process, based primarily on general industry salary surveys and supplemented by detailed analyses of selected market peers. Moreover, typically, the base salary determined through the benchmarking process is adjusted to take into account differences in key factors such as age, experience, education (on this see also Airoldi et al., 1994).

Executives view the base salary as an important component of their compensation package, both because being risk adverse they prefer a dollar increase in base salary to a dollar increase in target bonus, and because often target bonuses are expressed as a percentage of the base salary. As highlighted in Meo (2000), over time this component of the compensation package of executives has decreased its relative weight, in favor of other compensation components that are linked to firm's performance. As we will discuss later, this approach is part a profit-sharing perspective in which the value generated by the firm is shared between shareholders and top executives (Meo, 2000).

Contrary to the base salary, the annual bonus plan is a variable component of the compensation package of executives that is paid on a single-year performance. A bonus plan can be categorized in terms of three components:

i) the performance measure used in the plan; i.e. the metric(s) used by the company to measure the performance and pay the bonus accordingly,
ii) the performance target; i.e. the desired level of performance the manager should achieve;
iii) the structure of the pay-performance relation; i.e. the explanation of how the bonus rewarded to the executive increases as the actual performance measure becomes closer to the performance standard (or it goes beyond it).

Bonus plans can be either i) single performance measure plans, or ii) multiple performance measure plans (see Murphy, 1999), depending on whether the plan links the amount paid to the manager to just one performance measure or whether the bonus paid depends on the realization of two or more performance measures. In the second case (i.e. multiple performance measure plans), the performance measures can be either i) additive or ii) multiplicative. In the case of additive performance measures, the performance realized under one metric does not affect the amount of bonus that can be granted to the executive according to the second metric. In contrast, if the performance measures are multiplicative, the performance obtained under one metric affects the bonus that can be paid according to the other metrics.

The most common performance measures used in the bonus plans are (Di Pietra, 2012): Earnings Before Interests and Taxes (EBIT), Earnings Before Interests Taxes Depreciations and Amortization (EBITDA), Earnings Per Share (EPS), Economics Value Added (EVA), Cash Flow Return On Investment (CFROI), Return on Assets (ROA), and Return on Equity (ROE). Interestingly, Murphy (1999) documents that some companies include in the bonus plans also non-financial

performance measures such as customer satisfaction and the reach of strategic goals.

Of course, despite the clear benefits stemming from linking compensation to firms' performance, bonus plans come with their own limitations (Monks and Minow, 2011; Murphy, 1999):

- Accounting data are verifiable and widely understood but they are backward –looking, short-term oriented, and they can be manipulated,
- Managers know that good current performance will be penalized in the next period through an increased performance standard,
- If year-to-date performance suggests that annual performance will exceed that required to achieve the bonus cap (i.e. the maximum amount of the bonus that can be paid in one year), managers can withhold efforts trying to move earnings to the subsequent period,
- If expected performance is far below the incentive zone, managers can lose the motivation of "trying hard" to achieve the bonus threshold.

As highlighted in Cappiello (2005), investments in research, corporate reputation, or redesign of production processes increase the long-term value of the firm but in the short-term tend to decrease the accounting performance. In contrast, compensation practices that are linked to the market value of the firms can, at least in theory – provide managers with long-term incentives because the stock price – under the assumption of efficient markets- incorporates expectations about future cash flows (Cappiello, 2005). These considerations take us directly to the third component of compensation: equity grants.

Equity compensation is often the largest component in top executive compensation and can take the form of either stock options or restricted stocks. Stock options are contracts which give the recipient the right to buy a share of stock at a pre-specified exercise price for a pre-specified term. Executive options typically become vested (i.e. they can be exercised by the manager) over time and they are not-tradable. Finally, stock options granted to top executives are forgone if the manager leaves the firm before vesting. From an agency problem point of view, the main advantage of stock options is to provide a direct link between managerial rewards and share-price appreciation. In doing so, the interests of the agent (the manager) are aligned with those of the principal (the shareholders). Another key advantage of using stock options is that the share-price is a long-term oriented performance measure, and this is likely to foster a long-term orientation in the executives thereby limiting myopic decisions. At the same time, the stock price may depend on facts that cannot be controlled by the executive (e.g. market-wide trend) and this represents an important limita-

tion of this form of compensation. The reader will find in Meo (2000) a detailed analysis of the micro-characteristics of such plans.

Instead of granting stock options, the company may decide to grant restricted stocks. The stocks are restricted in the sense that they are forfeited under certain conditions. It is important to highlight that linking compensation to components that include variables that are not under the direct control of the manager can be more difficult and less favorably accepted during economic downturns. More in general, as explained in Riccaboni (1999), the acceptance by managers of control and incentives schemes appears to be easier in periods of economic growth because managers are more optimistic about the possibility to obtain benefits from incentives plans.

The last component of executive compensation is represented by long-term incentive plans. These plans have the same characteristics of the annual bonus plan, but with the key difference that the performance measure is computed on a rolling 3- or 5-year window. Doing so, long-term incentives plans should mitigate the shortcoming of annual bonus plans that - being linked to annual accounting performance - might lead to short-term decisions.

In the discussion of the different components of executive compensation it is important to remember that when firms remunerate executives using variable compensation, they also need to compensate managers for the increased risk (Cappiello, 2005). This implies that managers will accept a variable compensation based on restricted stock or stock options if and only if its market value is higher than the nominal value of the fixed compensation they forgo (Cappiello, 2005). This is the cost that companies willing to link executive compensation to future performance must be ready to incur.

Aligning performance goals and incentives

A key goal that any compensation plan should aim at fulfilling is the alignment of the performance goals with the incentives provided to the executives. From this perspective, a performance goal can be defined as a desired level of accomplishment against which actual results can be measured. Performance goals should be at the same time a set of aspirations and should provide guidance to employees and managers. To bring strategies to life, the company must first specify performance goals to communicate business direction and then identify performance measures to be attached to performance goals (Simons, 2000). This is important because employees pay attention to what they are measured on and therefore they will try to infer business strategy from their performance goals and measures. Consequently, when employees are measured on the right metrics, they are likely to lead the firm to the right direction and

this is going to happen if and only if performance measures used are suitable to support performance goals.

An incentive plan is supposed to support performance goals if it satisfies these three tests (Simons, 2000):

- The incentive plan must be aligned with the strategy. Specifically, by looking at the measures a manager is accountable for, it should be possible to infer the goals which she should focus on,
- It must be possible to effectively measure the performance dimensions used in the compensation plan. In particular, the performance measures selected must be independently measured and verified;
- The performance measures used should capture all the relevant attributes of achievement, and they should reflect actions that an executive can directly influence.

Finally, the metrics used in the compensation plan should be linked to shareholder value (Simons, 2000). This would align the interests of managers with those of the shareholders. More broadly, to assure the proper alignment of interests among the top executives, firms should use a systemic approach to executive compensation by defining compensation policies, levels and structure. In doing so, companies should consider that the remuneration granted to executives are determined by three factors (Airoldi et al., 1994):

i) the compensation level peer firms set for their executives,
ii) the relative value attributed by the firms to the internal positions, and
iii) the performance reached by the manager.

Importantly, an effective compensation plan, takes into consideration the human needs from a broad perspective (see on this Zappa, 1962) in order to design incentive schemes that properly motive managers to work in the desired direction. More in general, when setting goals and incentives, firms need to take into consideration motivation theories that explain how managers are expected to react to different forms of incentives (Meo, 2000).

A roadmap

Within the framework above discussed, this book aims at providing the reader with four specific focuses on executive compensation. In doing so, the objective is not to provide a comprehensive review of the literature, rather to foster the academic and professional debate around four currently under investigated topics.

The first topic, discussed in the second chapter, relates to the role of regulation on executive compensation. In an attempt to improve the corporate gov-

ernance in public firms and to mitigate potential conflicts of interest between shareholders and directors, legislators and regulators all over the world have adopted a wide range of regulatory activities regarding the remuneration of executives in listed firms. The diversity of regulatory approaches makes the analysis of the subject challenging and raises the question how differences in regulatory design affect compensation decisions, accounting and stock performance as well as other economic variables. Chapter 2 analyzes a specific regulatory change (i.e. the issuance of SFAS 123R) and discusses how firms responded to this regulatory change by adjusting the compensation structure of executives.

In the third chapter, the analysis moves to compensation practices in the financial industry. In doing so, the chapter focuses on a specific aspect highlighted in Zattoni (2015) that relates to the general perception that compensation schemes used by large banks to compensate their top executives have promoted risk-taking activities. The chapter aims at measuring risk-taking in the financial industry and investigating to which extent it is linked to compensation incentives.

Chapter four focuses on the compensation structure of non-CEO executives. Most of the literature in accounting and finance neglects the potential effect of the compensation structure of executives other than the Chief Executive Officer. Few studies, mainly in the earnings management domain, have also considered the compensation of the Chief Financial Officer, but this literature is pretty narrow. More importantly, we do not know much on the potential effect of the compensation structure of other non-CEO executives. Chapter 4 focuses exactly on this issue and aims at understanding to which extent all first order effects are captured by the compensation structure of the CEO.

Finally, the last chapter provides the reader with a focus on the consequences of executive compensation in driving misbehaviors. In doing so, the chapter focuses on earning management strategies as an example of misbehavior and it empirically investigates to which extent CEO's incentives – specifically equity and risk-taking incentives – model the trade-off among the different strategies available to executives to engage into earning manipulations and mislead external stakeholders.

Chapter 2
The Role of Regulation in Affecting Executive Compensation

This chapter focuses on a regulatory change introduced in the U.S. by the Financial Accounting Standard Board (FASB) in 2006 and it investigates how companies adjust their executive compensation policies following an intervention by the regulator. Results discussed in the chapter confirm the key role of regulation in affecting executive compensation structure.

Stock options, restricted stocks, regulation, intrinsic value, SFAS 123R

The issuance of SFAS 123R and changes in executive compensation plans

In December 2004 the Financial Accounting Standard Board (FASB) issued the SFAS 123R that mandated the expensing of executives' stock options (ESO) for reporting periods that begin after June 15, 2005 (FASB 2004). Under the previous accounting standard (SFAS 123) firms were allowed to use the "intrinsic value" method that made it possible for companies to not expense ESOs if they set exercise prices equal (or above) the grant-date market price of the underlying stock. Not surprisingly nearly all firms followed the intrinsic value method and issued at-the-money options (Brown and Lee, 2011). The new accounting standard drastically changed companies' incentives to grant stock options to executives because it eliminated the favorable accounting treatment reserved to this compensation component, which had become a zero-cost compensation tool.

Extant literature has taken the passage of the SFAS 123R as an exogenous change that modified firm's incentives to provide option-based compensation to executives and that led companies to review their compensation packages.

For instance, Brown and Lee (2011) document that firms replaced ESOs with restricted stocks and long-term incentives after the passage of SFAS 123R. Moreover, the authors show that ESO cutback around issuance of SFAS 123R is an increasing function of the accounting benefits that firm derived from ESO's favorable accounting treatment prior to the new accounting standard. These findings are consistent with previous studies (Healy et al., 1987; Carter et al., 2007) documenting that firm's decisions related to executive compensation are shaped by accounting rules and procedures.

In a related study, Choudhary et al. (2009) show that companies in anticipation of SFAS 123R accelerated option vesting if acceleration had a greater effect on future ESO compensation expense and firms suffered greater agency problems. These results provide further evidence of the wide impact of the new accounting standard on companies' compensation policies.

SFAS 123R has been issued to address concerns about option-based executive compensation and therefore the first and more immediate impact of the new standard is likely to affect stock option compensation, as documented by the above-mentioned contributions. Nonetheless, we argue that the introduction of the new standard may have induced company to rethink the entire executive compensation package which is not limited to stock option compensation. As Brown and Lee (2011) show, the new accounting standard not only affected option-based compensation, but it also had an indirect impact on restricted stocks and long-term incentives plans. We conjecture that the passage of SFAS 123R represents an exogenous shock to executive compensation plans that also affected executives' annual bonuses which are the most short-term oriented component of executive compensation. Specifically, we anticipate that the new standard forced firms to completely rethink their executive compensation plans and in doing so firms decided to decrease the influence of annual bonuses in overall compensation since they are short-term oriented. As Murphy (1999) agues, although virtually all annual bonus plans provide incentives to increase company profits there is a plethora of additional incentives provided by annual bonuses that are often in conflict with the ultimate firms' objective (i.e. shareholder value creation). The primary determinant of executive bonuses is accounting profit (Murphy 1999) that, if on one hand it is verifiable and widely understood, on the other hand it is affected by two major problems (Murphy 1999, p. 2,506):

- accounting earnings are inherently backward-looking and short-run oriented and therefore managers focused only on accounting profits may avoid actions that reduce current profitability but increase future firm value, such as cutting R&D;

- accounting profits can be manipulated either through discretionary adjustments in accruals or by shifting earnings across periods.

On the contrary other compensation components – such as long-term incentives plans or restricted stocks- are more long-term oriented and help the company to overcome the above-mentioned problems. Our argument is that when companies, as documented by previous literature, reviewed and modified CEO's compensation packages around SFAS 123R issuance in order to adjust option-based compensation and substitute it with other long-term oriented compensation components, they also replaced part of annual bonus with long-term incentives plans and restricted stocks. Therefore, in this chapter we study whether around the issuance of SFAS 123R companies replaced part of CEO's annual bonuses with long-term incentives plans and restricted stocks.

Empirical analyses

Sample selection and description

In order to investigate the above-stated research question, we use all available firm-year observations from Execucomp dataset over the period 2000-2009 with non-missing data on CEO's compensation and control variables used in the analysis. We only considered those firms that were required to adopt SFAS 123R starting from fiscal year 2006. The final sample is made by 12,246 firm-year observations coming from 1,952 unique firms representing 62 different two-digit SIC codes. As the tables 2.1 and 2.2 show, observations are quite uniformly distributed over time even if recent years are slightly more represented in the sample. As expected, manufacturing firms are the most numerous in the sample, followed by service and financial companies. In order to make sure that the different composition of the final sample in terms of industry does not affect results, we estimate all models including industry fixed effects based on the two-digit SIC codes.

Table 2.1. Sample composition by year

Fiscal Year	Freq.	Percent	Cum.
2000	1112	9.08	9.08
2001	1099	8.97	18.05
2002	1131	9.24	27.29
2003	1181	9.64	36.93

2004	1162	9.49	46.42
2005	1167	9.53	55.95
2006	1190	9.72	65.67
2007	1437	11.73	77.40
2008	1401	11.44	88.85
2009	1366	11.15	100
Total	*12246*	*100*	

Table 2.2. Sample composition by industry

Industry	**Freq.**	**Percent**	**Cum.**
MINING	579	4,73	4,73
CONSTRUCTION	134	1,09	5,82
MANUFACTURING	5.153	42,08	47,90
TRASPORTATION, UTILITIES & SANITARY SERVICES	1.366	11,15	59,06
WHOLESALE AND RETAIL TRADE	1.497	12,22	71,28
FINANCE, INSURANCE AND REAL ESTATE	1.615	13,19	84,47
SERVICES	1.852	15,12	99,59
OTHER	50	0,41	100,00
Total	*12.246*	*100*	

Table 2.3 describes the final sample in terms of CEO's compensation variables and CEO-and-firm related characteristics. BONUS_%, LTIP_%, STOCKS_% and OPTIONS_% are, respectively, the amount of annual bonus, long-term incentives, restricted stocks and stock options awarded to the CEO in a given fiscal year divided her total compensation. Total compensation includes, in addition to the compensation components just mentioned, also the base salary and other compensation elements as disclosed in Execucomp dataset. The table shows that on average, annual bonuses represent the 12% of CEO's annual compensation which is sensibly higher than the 9% represented by long-term incentive plans (the difference is significant at 1% level). As expected, the equity-based compensation represents the most important component of CEO's compensation and stock options are predominant with respect to restricted stocks (the difference is significant at 1% level). In the bottom part, the table, instead, reports descriptive statistics for other CEO and firm related characteristics that we include in

the analysis as controls since they have been shown to influence executive compensation (Murphy, 1985; Smith and Watts, 1992; Yermack, 1995; Dechow et al., 1996; Himmelberg and Hubbard, 2000; Jin, 2002; Carter et al., 2007). CEO_AGE is the age of the Chief Executive Officer as disclosed in Execucomp; B_M is the book-to-market ratio measured as book value of equity (Compustat data item "seq") divided firm's market value (Compustat data item "mkvalt"); SIZE is the natural log transformation of firm's total assets (Compustat data item "at"); ROA is firm performance computed as operating income after depreciation (Compustat data item "oiadp") divided by total assets (Compustat item "at"); CAPEX is firm's investment intensity computed as the ratio between capital expenditures (Compustat data item "capx") and annual sales (Compustat data item "sale"); LEV is firm's leverage computed as long-term debts over book value of equity (Compustat data item "dltt") over book value of equity (Compustat data item "seq"); CASH_CONS proxies for firm's shortage of cash computed as the three-year average of [(Common and preferred dividends – cash flow from investing – cash flow from operations)/total assets] , as in Carter et al. (2007) and Core and Guay (1999); finally DIV_YLD is firm's dividend yield computed as the average dividend yield over the three-year period ending the year prior to the year of interest.

Table 2.3. Descriptive statistics

	N	**Mean**	**SD**	**25th**	**50th**	**75th**
Compensation Variables						
BONUS_%	12246	0.123	0.165	0.000	0.044	0.204
LTIP_%	12246	0.094	0.156	0.000	0.000	0.157
STOCKS_%	12246	0.152	0.218	0.000	0.000	0.275
OPTIONS_%	12246	0.296	0.287	0.000	0.251	0.510
CEO-and-Firm Characteristics						
CEO_AGE	12246	55.29	7.36	50.00	55.00	60.00
B_M	12246	0.546	0.499	0.285	0.468	0.704
SIZE	12246	7.597	1.677	6.394	7.469	8.672
ROA	12246	0.082	0.097	0.040	0.079	0.129
CAPEX	12246	0.071	0.112	0.017	0.035	0.072
LEV	12246	0.651	1.338	0.034	0.378	0.864
CASH_CON	12246	-0.001	0.082	-0.045	-0.004	0.037
DIV_YLD	12246	0.013	0.018	0.000	0.004	0.019

Consistently with other research using Execucomp data, Table 2.3 shows that firms in the sample are relatively large and profitable. CEOs, on average, are 55 year-old and this is line with other recent studies analyzing CEO's characteristics (e.g. Demers and Wang 2010). Table 2.4 presents Pearson correlation coefficients among the main variables involved in the analysis. The first three rows of table 2.4 allow to gain insights on the substitution/complementary relations that exist among the different compensation components. Specifically, the correlation coefficients suggest that, on average, annual bonuses are used as substitute for other forms of compensation that are more long-term oriented. Interestingly, the only complementary relation documented in Table 2.4 is between restricted stocks and long-term incentive plans.

Table 2.4. Correlation matrix

	BONUS_%	OPTIONS_%	STOCKS_%	LTIP_%	CEO_AGE	B_M	SIZE	ROA	CAPEX	LEV	CASH_CON
OPTIONS_%	-0.197***	1									
STOCKS_%	-0.228***	-0.364***	1								
LTIP_%	-0.302***	-0.267***	0.040***	1							
CEO_AGE	0.071***	-0.116***	-0.053***	0.034***	1						
B_M	-0.068***	-0.133***	0.028**	-0.039***	0.050***	1					
SIZE	-0.007	0.047***	0.200***	0.172***	0.094***	0.018*	1				
ROA	0.127***	0.029**	0.006	0.107***	0.027**	-0.295***	0.049***	1			
CAPEX	0.01	0.030***	0.053***	-0.029**	-0.009	-0.018*	0.058***	-0.064***	1		
LEV	-0.002	-0.041***	0.052***	0.044***	0.015	0.103***	0.219***	-0.059***	0.031***	1	
CASH_CON	-0.020*	0.037***	-0.035***	-0.064***	-0.028**	0.089***	-0.001	-0.378***	0.157***	0.116***	1
DIV_YLD	0.027**	-0.201***	0.125***	0.083***	0.072***	0.112***	0.285***	-0.052***	-0.068***	0.199***	0.061***

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Changes in CEO's compensation around SFAS 123R adoption

In order to investigate our research hypothesis, we start by analyzing how the different components of CEO's compensation have changed before and after the adoption of SFAS 123R. From now on we refer to the time period from 2000 to 2005 as the pre-SFAS 123R period, while we call the time period from 2006 to 2009 the post-SFAS 123R period. Table 2.5 analyzes the change in CEO's compensation between the pre and post SFAS 123R period. As it is possible to notice, CEO's annual bonuses have dramatically decreased after the passage of

the new regulation while both long-term incentive plans and restricted stock have increased. Consistent with previous research (see Brown and Lee, 2011), table 2.5 confirms that after the implementation of SFAS 123R companies decreased the amount of stock options awarded to executives and replaced them with long-term incentives and restricted stocks. Results from table 2.5 therefore provide a first support to our research question even if the substitution effects between annual bonuses and long-term incentives and restricted stocks is still to be documented since the increase in these long-term oriented compensation components could be entirely due to the substitution effect with stock options documented by Brown and Lee (2011).

Table 2.5. Changes in CEO's compensation around SFAS 123R adoption

	PRE-SFAS 123R	POST-SFAS 123R		
Mean			**Diff.**	**P-Value**
BONUS_%	0.184	0.045	-0.138	0.000
LTIP_%	0.028	0.177	0.149	0.000
STOCKS_%	0.084	0.237	0.153	0.000
OPTIONS_%	0.368	0.203	-0.166	0.000

Substitution effect among compensation components

In order to analyze the impact of SFAS 123R on CEO's annual bonuses while controlling for other confounding variables we estimate the following OLS model with industry fixed effects and firm-clustered standard errors:

$$BONUS\_\% = \beta0 + \beta1 * POST + \beta2 * CEO\_AGE + \beta3 * B\_M + \beta4 * SIZE + \beta5 * ROA + \beta6 * CAPEX + \beta7 * CASH\_CON + \beta8 * DIV\_YLD + \varepsilon \quad (1a)$$

$$LTIP\_\% = \beta0 + \beta1 * POST + \beta2 * CEO\_AGE + \beta3 * B\_M + \beta4 * SIZE + \beta5 * ROA + \beta6 * CAPEX + \beta7 * CASH\_CON + \beta8 * DIV\_YLD + \varepsilon \quad (1b)$$

$$STOCKS\_\% = \beta0 + \beta1 * POST + \beta2 * CEO\_AGE + \beta3 * B\_M + \beta4 * SIZE + \beta5 * ROA + \beta6 * CAPEX + \beta7 * CASH\_CON + \beta8 * DIV\_YLD + \varepsilon \quad (1c)$$

In the above specification, POST is a dummy variable which takes on the value of 1 for observations from the post SFAS 123R period and zero otherwise; and all other variables are computed as previously described. Table 2.6 presents estimate results from 1a, 1b, and 1c. The negative and highly significant coefficient on POST in column 1 indicates that in the post-SFAS 123R period

companies decreased CEO's annual bonuses consistently with findings from the univariate analysis. The coefficients on POST in column 2 and 3, instead, complement results from column 1 since they show that in the same period long-term incentives and restricted stocks have significantly increased thus suggesting a substitution between annual bonus and other long-term oriented compensation components as predicted. Nonetheless results in Table 2.6, column 2 and 3 could simply be due to the substitution effect, documented by Brown and Lee (2011), that involved stock options.

Table 2.6. Changes in CEO's compensation around SFAS 123R adoption: Multivariate Analysis

	BONUS_%	LTIP_%	STOCKS_%
	(1)	(2)	(3)
POST	-0.139***	0.154***	0.147***
	[0.004]	[0.004]	[0.005]
CEO_AGE	0.001***	0.000*	-0.002***
	[0.000]	[0.000]	[0.000]
B_M	-0.008**	-0.021***	0.003
	[0.004]	[0.003]	[0.005]
SIZE	-0.002	0.008***	0.024***
	[0.002]	[0.001]	[0.002]
ROA	0.184***	0.147***	-0.029
	[0.023]	[0.019]	[0.027]
CAPEX	-0.031	-0.049**	0.050
	[0.024]	[0.024]	[0.034]
LEV	-0.000	0.003*	-0.000
	[0.001]	[0.002]	[0.002]
CASH_CON	-0.004	0.034*	-0.111***
	[0.023]	[0.020]	[0.033]
DIV_YLD	0.201	0.402***	0.591***
	[0.153]	[0.131]	[0.204]
INDUSTRY DUMMIES	YES	YES	YES

Constant	0.160***	-0.071***	-0.040
	[0.019]	[0.023]	[0.044]
Observations	12,246	12,246	12,246
R-squared	0.235	0.285	0.189

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Therefore, in order to better understand the determinants of the increase in long-term incentives and restricted stocks documented in table 2.6, we estimate the following OLS models with industry fixed effects and firm-clustered standard errors:

$$LTIP\_\% = \beta0 + \beta1 * BONUS\_\% + \beta2 * OPTIONS\_\% + \beta3 * POST + \beta4 * POST * BONUS\_\% + \beta5 * POST * OPTIONS\_\% \; \beta2 * CEO\_AGE + \beta3 * B\_M + \beta4 * SIZE + \beta5 * ROA + \beta6 * CAPEX + \beta7 * CASH\_CON + \beta8 * DIV\_YLD + \varepsilon \quad (2a)$$

$$STOCKS\_\% = \beta0 + \beta1 * BONUS\_\% + \beta2 * OPTIONS\_\% + \beta3 * POST + \beta4 * POST * BONUS\_\% + \beta5 * POST * OPTIONS\_\% \; \beta2 * CEO\_AGE + \beta3 * B\_M + \beta4 * SIZE + \beta5 * ROA + \beta6 * CAPEX + \beta7 * CASH\_CON + \beta8 * DIV\_YLD + \varepsilon \quad (2b)$$

In the above specifications, we include the level of bonus (BONUS_%) as explanatory variable and we interact it with the POST dummy. If companies substituted CEO's annual bonus with long term incentives plans and restricted stock around the issuance of SFAS 123R we should observe that the increase after 2006 in the latter is inversely related to the amount of annual bonuses. Since the substitution effect we conjecture to exist for annual bonuses has been also documented for stock options, we include in the model the level of stock option and its interaction with the variable POST. Doing so not only corrects for the presence of omitted correlated variable, but it also allows us to compare the substitution effect due to the annual bonuses with that due to stock options.

Table 2.7 presents results from estimating 2a and 2b and in order to allow a meaningful comparison across the coefficients involved in the analysis we report standardized coefficients.

The coefficients on BONUS_% and OPTION_% are negative and significant both in column 1 and 2 of table 2.7, indicating that companies use the different

compensation components as substitute. This is consistent with the fact that the different compensation elements provide different incentives to the CEO and the company trade-off the different elements of executive compensation. The sign and significance of the POST variable is consistent with what documented in table 2.6 while the interaction terms allows us to gain further support for our research hypothesis. Specifically, the negative and significant coefficient on the interaction terms that involve both annual bonuses and stock options are consistent with the presence of a substitution effect around SFAS 123R issuance. Particularly important for our conclusions is the fact that the coefficient on the interaction term between annual bonuses and the POST dummy is negative and significant also after controlling for the substitution effect due to the changes in stock options. Another interesting aspect that emerges from results reported in table 2.7 relates to the relative magnitude of the coefficients. Specifically, the standardized coefficient on the interaction term of annual bonuses is significantly higher than that of stock options in column 1 but it is lower (compared to the coefficient on stock options) in column 2. This suggests that companies substituted annual bonuses mainly with long-term incentives plan and stock options mainly with restricted stocks. This result is consistent with the fact that company preferred to substitute annual bonuses and stock options with the most similar compensation component.

As previously argued, the major problem of annual bonuses relates to their short-term orientation and to the fact that they can be easily manipulated by executives (Healy, 1985; Holthausen et al., 1995). In a recent work, Demers and Wang (2010) theoretically argue and empirically show that – in the absence of explicit compensation contracts - managers who maximize lifetime compensation in a perfectly competitive labor market would have little incentive to engage in income-increasing earnings management during the early stages of their careers and would face significant pressure to manage earnings upwards in the mature period. The authors analyze both accrual and real earnings management activities which are a commonly used tool in earnings management practices (e.g. Dechow et al., 1995; Cohen et al., 2008; Cohen and Zarowin, 2010). The underlying idea is that the executive receives only a fraction of the benefit of the managed earnings in the early stage of her career because some portion of the superior performance is attributed to noise or luck whereas she is punished fully in the later years when accruals reverse, or the real activities manifest in value destruction. By contrast, at least some portion of the discretionary accruals of the older executive will reverse after she has retired and hence the benefits of earnings management exceed the costs for mature executives, up to a certain optimal point (Demers and Wang 2010, p. 2). Consistently with their

theoretical arguments, Demers and Wang (2010) find that older CEOs engage more in accrual-based and real earning management activities.

Table 2.7. Substitution effect between CEO's annual bonuses, LTIPs and restricted stocks

	LTIP_%	STOCKS_%
Standardized Coefficients	(1)	(2)
BONUS%	-0.114***	-0.305***
	[0.011]	[0.020]
OPTIONS%	-0.078***	-0.264***
	[0.007]	[0.013]
POST	0.164***	0.099***
	[0.007]	[0.011]
POST*BONUS%	-0.361***	-0.090***
	[0.020]	[0.030]
POST*OPTIONS%	-0.112***	-0.168***
	[0.012]	[0.017]
CEO_AGE	0.000	-0.003***
	[0.000]	[0.000]
B_M	-0.026***	-0.008*
	[0.004]	[0.004]
SIZE	0.011***	0.034***
	[0.001]	[0.002]
ROA	0.180***	0.046*
	[0.019]	[0.026]
CAPEX	-0.043*	0.073**
	[0.022]	[0.030]
LEV	0.002	-0.002
	[0.002]	[0.002]

CASH_CON	0.055***	-0.082***
	[0.019]	[0.030]
DIV_YLD	0.085	-0.258
	[0.126]	[0.180]
INDUSTRY DUMMIES	YES	YES
Constant	-0.040	0.061
	[0.028]	[0.065]
Observations	12,246	12,246
R-squared	0.373	0.337
POST*BONUS% = POST*OPTIONS%	p-value = 0.000	p-value = 0.003

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Given the above, to the extent that the underlying reason for cutting short-term bonuses when rethinking CEO's compensation package around SFAS 123R issuance is related to the firm's attempt to overcome agency problems, we should observe that around SFAS 123R issuance annual bonuses of older CEOs have been cut to a larger extent with respect to annual bonuses for young CEOs. Consistently with Demers and Wang (2010), we proxy for CEO's career concerns using the age of the CEO as disclosed in Execucomp dataset (CEO_AGE) and a dummy variable that takes the value of 1 (zero) if CEO's age is above (below) the median CEO's age (AGE_ABOVE). We then interact these variables with the dummy POST and fit the following OLS models with industry fixed effects and firm-clustered standard errors:

$$BONUS\_\% = \beta 0 + \beta 1 * POST + \beta 2 * POST * CEO\_AGE + \beta 3 * CEO\_AGE + \beta 4 * B\_M + \beta 5 * SIZE + \beta 6 * ROA + \beta 7 * CAPEX + \beta 8 * CASH\_CON + \beta 9 * DIV\_YLD + \varepsilon \quad (3a)$$

$$BONUS\_\% = \beta 0 + \beta 1 * POST + \beta 2 * POST * AGE\_ABOVE + \beta 3 * AGE\_ABOVE + \beta 4 * B\_M + \beta 5 * SIZE + \beta 6 * ROA + \beta 7 * CAPEX + \beta 8 * CASH\_CON + \beta 9 * DIV\_YLD + \varepsilon \quad (3b)$$

Table 2.8. CEO's annual bonuses cutback and CEO's career concerns

	BONUS%	
	(1)	**(2)**
POST	-0.131***	-0.071**
	[0.005]	[0.033]
POST * AGE_ABOVE	-0.015**	
	[0.007]	
POST * CEO_AGE		-0.001**
		[0.001]
AGE_ABOVE	0.019***	
	[0.005]	
CEO_AGE		0.002***
		[0.000]
B_M	-0.008**	-0.008**
	[0.004]	[0.004]
SIZE	-0.002	-0.002
	[0.002]	[0.002]
ROA	0.185***	0.183***
	[0.023]	[0.023]
CAPEX	-0.032	-0.030
	[0.024]	[0.024]
LEV	-0.001	-0.000
	[0.001]	[0.001]
CASH_CON	-0.002	-0.002
	[0.023]	[0.023]

DIV_YLD	0.212	0.205
	[0.153]	[0.153]
INDUSTRY DUMMIES	YES	YES
Constant	0.215***	0.132***
	[0.015]	[0.024]
Observations	12246	12246
R-squared	0.234	0.236

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Results presented in table 2.8 support our conjecture that annual bonus' cutbacks around the issuance of SFAS 123R are larger for older CEOs which are more prone to engage in opportunistic behaviors in order to maximize lifetime compensation. Interestingly, the coefficient on CEO's age is positive and highly significant across both model specifications thereby suggesting that older CEO's receive, on average, more compensation in the form of annual bonuses. In the light of results presented by Demers and Wang (2010) this seem far away from being an optimal compensation strategy for companies. Therefore, the decision of drastically reducing CEO's annual bonuses after the exogenous shocks represented by the issuance of SFAS 123R is consistent with companies trying to move towards a better compensation strategy.

Difference-in-difference analysis

Taken together, results presented provide a strong support for our research hypothesis but they still leave open the issue that the documented decrease in annual bonuses around SFAS 123R may be due to a general time trend and might not be the causal effect of the implementation of the new accounting standard. We address this last concern by implementing a difference-in-difference analysis using as benchmark a group of firms that - either because of their fiscal-year end month or because they filed as small businesses issuers – did not report under SFAS 123R in fiscal year 2006. We therefore compare the change in CEO's annual bonuses between 2005 and 2006 for companies that reported under the new standard in 2006 (treatment group) and the change of companies that in 2006 still used the old reporting rules (control group). If the documented decrease in CEO's annual bonus is significantly higher for the treatment group than the control group, there would be further support for the idea that the

decrease in CEO's annual bonuses is indeed due to the introduction of the new accounting standard.

Since 2006 is the only year in which the two reporting formats coexist, we only include two years (2005 and 2006) in the analysis in order to make sure that results are not driven by the different sample size of the pre and post- SFAS period. We identified 998 companies with all necessary data both in 2005 and 2006 that applied SFAS 123R for the first time in 2006 and 228 firms which in 2006 still reported under the old accounting standard. Therefore, the final sample is made by 2,452 firm-year observations classified as follows:

Table 2.9. Difference-in-difference sample

	2005	**2006**	**N**
Treatment group	998	998	1,996
Control group	228	228	456
N	1,226	1,226	2,452

We then fit the following OLS model with industry fixed effects and firm-clustered standard errors in which we omit the constant:

$$BONUS\_\% = \alpha1 * NEW\_SFAS + \alpha2 * OLD\_SFAS + \alpha3 * NEW\_SFAS * POST\_2006 + \alpha4 * OLD\_SFAS * POST\_2006 + \alpha5 * CEO\_AGE + \alpha6 * B\_M + \alpha7 * SIZE + \alpha8 * ROA + \alpha9 * CAPEX + \alpha10 * CASH\_CON + \alpha11 * DIV\_YLD + \varepsilon \quad (4)$$

In the above specification, NEW_SFAS is a dummy variable which takes on the value of 1 if the firm belongs to the treatment group, zero otherwise; OLD_SFAS is a dummy variable which takes on the value of 1 the firm belongs to the control group, zero otherwise; POST_2006 is a dummy variable which takes on thw value of 1 the observations belongs to fiscal year 2006, zero otherwise; and all other variable are computed as previously defined. Using coefficients from (4) it is possible to perform a difference-in-difference analysis comparing the magnitude of the coefficients between the treatment and control group as specified in table 2.10.

Table 2.10. Difference-in-difference coefficients

	2005	**2006**	**Diff.**
Treatment group	$\alpha1$	$\alpha1 + \alpha3$	$\alpha3$
Control group	$\alpha2$	$\alpha2 + \alpha4$	$\alpha4$
			$\alpha3$ vs. $\alpha4$

In particular, α3 indicates the direction, magnitude and statistically significance of the change in CEO's annual bonus between 2005 and 2006 for the treatment group (that is companies that adopted SFAS 123R in 2006) while α4 indicates the direction, magnitude and statistically significance of the change in CEO's annual bonus between 2005 and 2006 for the control group. Testing if these two coefficients are statistically different allows to understand if the change in CEO's annual bonuses can be causally attributed to the introduction of the new accounting standard. Table 2.11 reports estimate results from (4) and also shows estimate coefficients using LTIP_% and STOCKS_% as dependent variable in model (4).

Table 2.11. Difference-in-difference results

Panel A				
BONUS_%				
	2005	2006	Diff.	Sig.
Treatment	0.323	0.156	- 0.167	***
Benchmark	0.316	0.336	0.020	*
			- 0.187	***
Observations	2,452			
R-squared	0.589			
Panel B				
LTIP_%				
	2005	2006	Diff.	Sig.
Treatment	- 0.032	0.140	0.172	***
Benchmark	- 0.041	- 0.036	0.005	
			0.167	***
Observations	2,452			
R-squared	0.523			
Panel C				
STOCKS_%				
	2005	2006	Diff.	Sig.

Treatment	0.140	0.203	0.063	***
Benchmark	0.130	0.158	0.028	**
			0.035	**
Observations	2,452			
R-squared	0.450			

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Table 2.11, panel A indicates that CEO's annual bonuses decreased after the adoption of SFAS 123R only for the treatment group while they slightly increased for the control group of firms that did not adopt the new accounting standard. This allows us to rule out the alternative explanation that the decrease in CEO's annual bonuses is simply the outcome of a more general time trend unrelated to the issuance of the new accounting standard. Results presented in panels B and C are consistent with the fact that the new regulation had an incremental impact on the increase of long-term incentive plans and restricted stock, consistent with the substitution effect between annual bonuses and other long-term oriented compensation components.

Table 2.12. Extended difference-in-difference

Panel A				
Mean	Treatment Group	Control Group	Diff.	Sign.
CEO_AGE	55.77	55.86	-0.099	
B_M	0.430	0.462	-0.032	
SIZE	7.723	7.192	0.531	***
ROA	0.094	0.105	-0.010	*
CAPEX	0.067	0.047	0.019	**
LEV	0.564	0.369	0.195	***
CASH_CONS	-0.011	-0.015	0.005	
DIV_YLD	0.012	0.007	0.005	***
Panel B				

BONUS_%				
	2005	2006	Diff.	Sig.
Treatment	0.180	0.041	- 0.139	***
Benchmark	0.177	0.223	0.046	***
			- 0.185	***
Observations	2,452			
R-squared	0.591			
LTIP_%				
	2005	2006	Diff.	Sig.
Treatment	0.170	0.362	0.192	***
Benchmark	0.156	0.180	0.025	**
			0.167	***
Observations	2,452			
R-squared	0.522			
STOCKS_%				
	2005	2006	Diff.	Sig.
Treatment	0.184	0.240	0.056	***
Benchmark	0.160	0.181	0.021	
			0.034	***
Observations	2,452			
R-squared	0.451			

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

As explained, our ultimate test of the causal relation between the adoption of SFAS 123R and the reduction of CEO's annual bonuses relies on the comparison between a treatment group and control group. Unfortunately, the control group just includes few companies because in 2006 the vast majority of firms reported under SFAS 123R. Moreover, many companies are included in the control group because they file as small issuer and this may give rise to doubts on the comparability among the two groups of firms used in the difference-in-difference analysis. In order to shed light on this potential issue, we start comparing the treatment and control group in terms of CEO and firm related character-

istics. Wilcoxon-Mann-Whitney tests reported in Table 2.12, panel A indicate indeed that the treatment and control group differ in sever characteristics. Specifically, firms in the treatment group are larger, more profitable, and have higher levels of capital investment, leverage and dividend yields. As long as these characteristics influenced the decision of reducing CEO's annual bonuses around SFAS 123R issuance the differences documented in table 2.11 between the treatment and control group might be explain by differences in firm characteristics between the two groups. In order to address this concern, for any of the above-mentioned variables that differentiate the treatment and control group we create a dummy variable that takes on value of 1 if the firms has a value of that variable above the sample median and zero otherwise. Then we include these variables in model (4) and we interact them with the POST_2006 variable. Even if this methodology has the disadvantage of introducing collinearity in the model, it mitigates the concern that the difference between the treatment and control group documented in table 2.11 is due to differences in the composition of the two groups. Table 2.12, panel B reports estimate results for this extended model and strongly supports conclusions drawn in the main analysis.

Conclusions

Starting fiscal year 2006, U.S. companies started to report under the new SFAS 123R that mandates the expensing of executives' stock options (ESO) and forbids the use of the intrinsic value method that allowed companies to avoid reporting costs for executive option grants. Literature has documented that around the issuance of the new accounting standard companies revised their compensation packages in order to minimize the potential negative impact on profits of the introduction of the new accounting standard (Choudhary et al. 2009). In this line, Brown and Lee (2011) document that around the issuance of the new accounting standard companies substitute executive stock options with other compensation components such as restricted stocks and long-term incentive plans. Moreover, the authors document that decrease in stock option is correlated to the amount of accounting benefits the firm derived from ESOs' favorable accounting treatment prior to SFAS 123R thus validating a causal relation between the issuance of the new accounting standard and the cutback of stock options. These results suggests that the introduction of the SFAS 123R represented an exogenous shock that made companies to deeply revise their compensation packages. In this chapter, we argue and empirically document that companies also reviewed other components of executive compensation around the issuance of the new regulation and did not limit the changes to ESO. Using a large sample of US firms over the period 2000-2009, we find that around the

adoption of SFAS 123R companies also decreased the role of annual bonuses in the compensation package of their CEOs. Since literature has documented the detrimental effect that short term-oriented compensation components can have on CEO's decisions and opportunistic behaviors we argue that when companies reviewed CEO's compensation packages as a reaction to SFAS 123 R's introduction, they also took this opportunity for substituting annual bonuses with other more long-term oriented compensation components. Consistent with our conjecture we find that the cutback in annual bonuses is higher in companies where the CEO is nearer to the retirement since previous literature documented that mature executives are more likely to engage in opportunistic behaviors to maximize lifetime compensation (Demers and Wang, 2010). We corroborate our finding by implementing a difference-in-difference analysis using a control group of companies that in 2006 still reported under the old accounting standard. We find that the decrease in annual bonuses only affected companies that adopted the new financial accounting standard thus supporting the causal link between SFAS 123R introduction and the decrease in CEO's annual bonuses.

Chapter 3
Executive Compensation in the Financial Industry

This chapter focuses on the investigation of executive compensation in the financial industry, and it studies to which extent equity incentives provided to top executives at large banks have fostered risk-taking behaviors. Results support the notion that executives responded to risk-taking incentives embedded in their compensation contracts and engaged into risky activities that exploded during the 2007-2008 financial crisis.

Banks, financial industry, risk-taking, financial crisis

Risk-taking behaviors in the financial sector

The recent financial crisis and the connected scandals have fostered a debate on top executive compensation in the financial sector, with a particular focus on the link between compensation granted to top executives in financial institutions and the subsequent performance of these banks (Zattoni, 2015). In particular, it has been argued that the structure of executive compensation at large banks has promoted risk-taking behaviors that turned out to be detrimental for the long-term value to the financial institutions in which these executives operated (Zattoni, 2015). An example of these risk-taking behaviors often discussed in the literature (see Cerbioni at al., 2015) relates to securitization transactions.

From 2000 to 2006 the amount of loans securitized almost doubled while the securitization of risky subprime mortgages grew by almost eight times, exceeding 800 billion US dollars at the end of 2006. Whether highly incentivized CEOs foresaw in securitizations under US GAAP an opportunity for hiding risks while bearing them, and generating profits and cash flows because of the risks, is an open issue that this chapter is going to explore.

Securitizations transform illiquid assets into liquid securities and transactions that qualify for sale accounting offer several benefits that make them particularly appealing to originators. First, securitization enables financial institutions to optimally choose their exposure to the credit risk of loans generated (Jiangli and Pritsker, 2008). Second, securitization enables banks to replace illiquid loans with cash, improving banks' liquidity. Third, financial institutions subject to regulatory capital requirements through securitizations increase regulatory capital ratios and free up regulatory capital. Fourth, securitization allows banks to increase their profitability through "gains on sale".

However, financial intermediation theories point out severe concerns over the effects of such transactions. A single lender has strong incentives to monitor stemming from holding illiquid loans on its balance sheet, while separating loans' originator and the bearer of loans' default risk might induce lax screening (Diamond, 1984). Consistently, the recent financial crisis has shown a large rate of delinquencies among the heavily securitized non-agency mortgages. Additionally, securitization generates frictions (Ashcraft and Schuermann, 2008). The transferor of loans has superior information with respect to the transferee and this creates moral hazard and adverse selection problems. Rajan (2006, p. 500) adds to those concerns the idea that the changes in the financial sector have altered managerial incentives, which in turn have altered the nature of risks undertaken by the system, with potential distortions.

Understanding the determinants of risk-taking behaviors in the banking industry, and the role of equity and risk-taking incentives, is of prominent importance because several factors that are unique to this setting affect risk-taking strategies.

First, financial institution being highly levered have incentives to engage in excess risk-taking, as shown by Jensen and Meckling (1976). Second, financial institutions raise debts through depositors or the direct access to Central Banks and, as a consequence, the increase in the level of risk does not necessarily translate into an increase in the cost of debt. Typically, depositors are small uninformed investors with deposits insured by the government as thus they lack the incentives and the abilities to monitor bank investments' decision and risk profile. Third, because the failure of one bank may generate a contagion effect, governments provide both explicit and implicit guarantees. As a consequence, the debt markets do not adjust the terms of their credit to account for the change in the bank risk profile. Consistent with this view, Haldane (2011) documents that in the pre-crisis period the credit default swap markets did not distinguish strong from weak banks.

Therefore, given the absence of debt markets constrain in the level of risk, risk incentives stemming from stock and option compensation might have a free reign in banks. This problem is further exacerbated if accounting regimes reduce the efficacy of capital adequacy requirements aimed at limiting risk taking behaviors.

To address our research questions, we collect data from 10-K filings on the percentage of loans securitized and the amount of losses recorded on these loans for a sample of US financial institutions for the period 2003-2009. Moreover, we retrieve data on the financial institutions most involved in the securitization of subprime loans from a proprietary database that collects information on issuer of subprime securitizations in the US. We conduct our analysis in four steps, each of which speaking to the role of CEO's equity and risk incentives in boosting securitizations and in motivating executives to transfers risks to outside investors. In our research design we control for CEO's incentives being potentially endogenous with respect to securitization using a two-stage least-squares (2SLS) approach.

In the first set of analyses, we investigate the association between CEO's equity and risk incentives and total securitization. We document that CEOs with high levels of equity incentives engaged more in securitizations than executives with low equity incentives. This finding suggests that CEOs foresaw in securitizations under US GAAP an opportunity to boost stock price by generating cash flow, enhancing profits and/or freeing up regulatory capital. In the second set of analyses, we shift our focus from banks' decision to engage in securitizations to the quality of the assets transferred and the choice of opportunistically transferring off balance the risks generated. We document that CEOs with high equity and risk incentives engaged to a larger extent in the securitization of risky loans than low incentivized executives, and they transferred risk to outside investors by moving off-balance the riskiest loans. These results are consistent with the fact that securitization allowed CEOs to engage in risky lending activities and subsequently hiding the risks generated from the books, thus offering the opportunity to reduce the perceived risk while betting on it. Third, in order to provide further insights on the opportunistic behavior of CEOs when transferring risks off-balance, we investigate the relation between CEO's incentives and the level of disclosure linked to securitization transactions. We find that CEO's risk incentives are negatively related to the quality of securitization disclosure. This result suggests that CEOs incentivized on risk were less prone to provide information on the quality of loans transferred off-balance. This finding further corroborates the idea that risk incentives have motivated CEOs to opportunistically take advantage from information asymmetry generated by securitiza-

tion transactions. Fourth, we document that before the collapse of the subprime mortgage market in 2007, financial institutions involved in the securitization of subprime loans largely over performed other banks in terms of stock returns and accounting earnings. On the contrary, starting from 2007, subprime securitizers recorded worse performances than other financial institutions that were not involved in subprime securitization. Moreover, subprime securitizers were able to distribute more dividends than the peers. This is consistent with the fact that by securitizing risky loans banks were successful in boosting stock prices, increasing earnings and allowing dividend distribution, but the risks undertaken turned out to be extremely costly.

This work contributes to several research streams. First, we contribute to the debate about compensation and risk taking in financial institutions showing that highly incentivized CEOs have used securitization to hide risks while betting on them. At the best of our knowledge this is the first research that provides evidence that compensating CEOs of financial institutions as CEOs of industrial companies might be detrimental, supporting John et al. (2000, p. 97) analytical model which purports for "a prominent role for managerial compensation in bank regulation". Second, we add to the emerging research strand investigating the role of CEO's compensation in the financial crisis. Fahlenbrach and Stulz (2011) provide evidence that banks where CEOs had high equity incentives performed significantly worse during the crisis than banks where CEOs had low incentives. We complement this result as we show that CEOs with high equity incentives systematically engaged in securitization transactions to a larger extent than CEOs with low levels of equity compensation and that they also securitized risky loans such as subprime mortgages. Third, we add to the growing research stream analyzing the determinants and effects of securitization transactions (Chen et al., 2008; Landsman et al., 2008; Dechow and Shakespeare, 2009; Dechow et al., 2010; Amiram et al., 2011; Cheng et al., 2011; Barth et al., 2012). We contribute to this debate by focusing the analysis on the financial industry and documenting the relationship existing between CEO's equity compensation and securitization transactions. We therefore bring into the research framework direct evidence about one of the fundamental causes underlying securitization transactions that have been overlooked by previous literature. Fourth, at the best of our knowledge this work is the first to formally investigate the level of disclosure linked to securitization transactions as a proxy for CEO's opportunistic behaviors.

Concluding, our results answer to the increasing demand for evidence on the role of CEO's incentives on the financial crisis that led economists to claims

that "we're all paying now because skewed financial incentives led to too many big bets" (Solomon and Paletta, 2009).

Asset securitization as a form of risk-taking

Asset securitization consists in converting illiquid assets, usually small loans that could not be separately sold, into liquid securities (ABSs) that are sold to investors in the financial market. By dividing, repackaging and distributing risks within the financial system securitizations transform risks into an "easily tradable commodity" (Haldane 2008, p. 32) triggering a shift from the traditional "originating and holding" banking business model to the "originating and selling" model.

The securitization process substitutes the close relationship between borrower and lender with a long chain which starts when the originator, typically a commercial bank or another financial institution, generates loans. The originator transfers the loans to a special purpose entity (SPE) becoming a sponsor of the SPE. The role of the SPE is to manage the loan pool and issue ABSs that give investors the right to receive the cash flows originated from the underlying loans. When the SPE issues ABSs, it divides them into different tranches (senior, mezzanine and junior) which have different returns and levels of risk, as reflected by ratings received by rating agencies. Finally, the amounts paid by the investors for the ABSs are transferred to the originator/sponsor which replaces the illiquid loans previously held in the balance sheet with cash.

This long chain, linking borrowers with investors, is a mix of on balance and off-balance sheet conduits that generate, at every additional link in the chain, an increase in the scope of information gaps (Chen et al., 2008). These information asymmetries combined with the favorable accounting treatment prescribed by SFAS 140 offered the opportunity to hide the risks generated and to bet on them.

Under SFAS 140, almost all securitizations were accounted for as a sale with the consequence that loans were derecognized from the balance sheet of the originator. Two are the most critical issues about the accounting for securitization: a) derecognition; and b) consolidation. SFAS 140 using a "financial component approach" allows to decompose assets into a variety of components whose accounting treatment depends on whether the transferor has surrendered control or not. Moreover, to eliminate definitively assets from balance sheet, the transferor has also to avoid the consolidation of SPEs (special purpose entities). Under SFAS 140 a QSPE (qualified special purpose entity) was "automatically" excluded from consolidation and the accounting standard required that a qualifying SPE has to be demonstrably distinct from the transferor and significantly limited in its activities. Understanding whether a SPE is a QSPE required judg-

ment and involved discretionality typically used to avoid the consolidation of the vehicle.

A central point surrounding securitizations is that these transactions might have reduced the incentives of financial intermediaries to carefully screen borrowers. For a lender to screen and monitor it must be given appropriate incentives and this can be provided by the illiquid loans on its balance sheet (Holmström and Tirole 1997; Diamond and Rajan 2009). When, thanks to securitization, banks replace illiquid loans with cash they might lose the appropriate level of incentives to properly monitor the quality of loans granted. In this line, Keys et al. (2010) investigate the relationship between securitization and screening standards in the context of subprime mortgage loans and find that existing securitization practices did adversely affect the screening incentives of subprime lenders.

By eliminating loans from the balance sheet, securitization transactions also provide the originator with the benefit of reducing risk-based capital (Jones, 2000; Acharya and Richardson, 2009). The critical point is that even when the bank's originator buys back the most junior tranches of ABSs, loans are eliminated from banks' balance sheet. Nonetheless, because of this explicit guarantee that represents an important credit enhancement mechanism, the originator continues to bear the risks arising from the loans. Consistent with the view that securitizations do not lead to a shift of the risks of the underlying loans, Barth et al. (2012) show that the bond market perceive firm's credit risk as associated with both the retained and the non-retained portion of securitized assets. Moreover, Landsman et al. (2008) show that the stock market treats securitized assets and liabilities held by a SPE as belonging to the sponsor-originator. However, because of the lack of coordination among accounting standards, regulatory capital requirements and tax law, an originator can increase the income and the level of risk without increasing the required TIER 1.

Finally as the interest rate of the pool of loans increases, the earnings arising from a securitization increase too. Therefore the more the subprime loans securitized the greater the earnings realized, but because of the implicit and explicit guarantee provided by the originator bank, the earnings are deeply rooted into risks . Additionally, securitizations with further involvement, as in the presence of retained interest, do not trigger a taxable sale event, thus generating a greater positive impact on income.

Because banks' risk profile is likely to be affected by CEO's equity compensation and most securitization transactions appear to be deeply rooted into risk, we analyze whether highly incentivized CEOs' used securitizations to reduce the perceived risk while betting on it. The idea that compensation programs

are one of the determinants of the misalignment of incentives and conflicts of interest that permeate the "securitization chain" has also been confirmed by the Bank for International Settlements (2011), thus making the research question even more intriguing and timely.

Executive incentives and risk-taking

We develop our predictions distinguishing among two separate but complementary aspects of CEO's stock and option compensation: equity and risk incentives. Equity incentives are defined as the variation in executive's wealth caused by a change in stock price and therefore measure the strength of CEO's incentives to increase the value of firm's stock. Risk incentives, instead, are defined as the variation in executive's wealth caused by a change in stock price volatility and therefore measure the strength of CEO's incentives to increase firm's risk profile (Core et al., 2003).

When securitization transactions qualify for sale accounting, as almost all securitizations did under SFAS 140, they offer several benefits that make them particularly appealing to the originator. First, securitization enables banks to optimally choose their exposure to the credit risk of loans generated (Jiangli and Pritsker 2008). In fact, through securitization activities banks can decide which loans to fund on balance sheet and which to sell outside. Second, securitization enables banks to replace illiquid loans with cash, thus improving banks' liquidity and multiplying banks' resources available for being invested in the lending activity. Furthermore, as previously discussed, if the financial institution is subject to regulatory capital requirements, securitization transactions under US GAAP allow to increase regulatory capital ratios and free up regulatory capital. Third, securitization allows banks which are efficient in originating certain asset types, for instance credit card receivables, to improve market share without creating balance sheet concentration (Bank for International Settlements, 2011). Fourth, if an originator is able to achieve off-balance sheet accounting treatment, the removal of balance sheet assets improves certain financial ratios, such as the leverage capital ratio or return on assets. In addition, sales treatment could increase non-interest income, which combined with the capital requirements, improve the originator's return on equity (Bank for International Settlements, 2011). Fifth, securitization allows banks to increase their profitability through "gains on sale". In fact, under SFAS 140 banks could record a gain equal to the difference between the allocated book value of sold components and net proceeds from securitization. Moreover, as the interest rate of the pool of loans increases, the earnings arising from a securitization increase too. Thus, the more the subprime loans securitized the more the earnings realized. In

fact subprime-mortgage-related positions, even the most junior, generally have experienced good investment performance as long as home prices appreciate and debt markets are sufficiently liquid (Ryan, 2008). Nonetheless, because of the implicit and explicit guarantee provided by the originator, the earnings are deeply rooted into risks.

In a nutshell, securitizations under US GAAP had the potential of greatly improving banks' shareholder value: simply put, securitization gives the bank more options for funding its activities and managing its risk profile and, all else equal, expanded opportunities should increase bank's value (Jiangli and Pritsker, 2008). Moreover, the profit opportunities offered by subprime securitizations have led experts in the industry to define these financial transactions as "a machine that just manufactures earnings out of thin air" (Browning, 2007). Given securitization's potentiality for boosting shareholder value, we conjecture that CEOs whose wealth is more tightly linked to firm's stock price have greater incentives to engage in securitization of risky and non risky loans than CEOs with low equity incentives, in order to maximize the value of their equity holding. As a consequence, we anticipate that equity incentives positively affect the securitization of risky and non risky loans.

CEO's equity compensation can also influence the riskiness of the securitization transactions undertaken. Suppose, for instance, that the bank can invest either in a subprime loan pool or in a prime loan pool, both with a duration of 10 years. If the bank chooses the subprime loans there is an x percent chance that the investment will create a wealth of $W0$ in the next ten years and a $(1\text{-}x)$ percent chance that the investment will create a wealth of $W2$ in the same time period. Alternatively, the bank can grant the prime loans that create a wealth of $W1$ with x =100, being $W2 >> W1 > W0$. Since shareholders are well diversified they would prefer the risky scenario and betting on the possibility of increasing bank's wealth to $W2$. In fact, as holders of a call option on the firm which can be exercised at any time when firm's equity exceed the value of debt (Merton, 1974), shareholders benefit entirely for the upside with limited losses on the downside. Thus, in companies with limited liability shareholders have a strong incentive to increase the riskiness of the investments. In order to induce CEOs to choose the risky scenario, shareholders can give CEOs option grants thus increasing their wealth sensitivity to changes in stock volatility. In this line, Coles et al. (2006) document that higher sensitivity of CEO wealth to stock volatility leads executives to implement riskier policy. Nonetheless, as stock and option-based compensation increases the executive's personal portfolio becomes less diversified and the executive becomes more risk averse and more likely to pursue strategies aimed at mitigating the risk of the institution (Smith

and Stulz, 1985). Moreover high levels of perceived risks can negatively affect a manager's tenure and job security (Ronen and Sadan, 1981; Carlson and Bathala, 1997) and can harm her reputational and human capital. As a consequence, it could be possible that, even if CEOs are provided with risk incentives, they prefer the low risk scenario that ensures *W1* instead of betting on risky lending activities that could deliver *W2* but also *W0*.

The use of securitization allows to deeply change the timing of the pay-off for the undiversified executive in the presence of high-risk incentives. In fact, the executive can choose to invest in the subprime loan pool and securitize it. In this scenario the bank immediately records the gains and revenues and get *W2* while the negative outcome *W0* remains delayed over time until the bank has to eventually record the loss on the retained interest. As a consequence, the securitization makes the risky scenario much more appealing to undiversified executives that are incentivized on risk. In fact, by changing the timing of the payoff, the securitization allows undiversified but risk incentivized CEOs to bet on risky scenarios while delaying any negative outcome related to them that might negatively affect their tenure, job security and human capital. This argument is consistent with results in Grant et al. (2009) showing that risk-averse managers incentivized to take risks smooth income with the goal to reduce the perceived risk and create accounting reserves to cover potential losses. Therefore, we expect a positive relationship between CEO's risk incentives and the securitization of risky loans. Thus, we conjecture that risk incentives positively affect the securitization of risky loans.

Empirical evidence

Measuring equity incentives and risk-taking

For the purpose of our analysis, we identify all financial institutions (SIC codes between 6000-6300) available on Execucomp dataset in fiscal year 2003 and we keep all observations with an identifiable CEO throughout 2003-2009. In order to mitigate any possible survivorship bias, we augment our sample including financial institutions that have been delisted during the financial crisis but that have at least five years of data starting fiscal year 2003, thus assuring that we have information on these institutions at least until 2007 when the crisis has started. For our sample banks, we hand collect data on securitization activities from 10-K filings using disclosure under SFAS 140; we retrieve control variables from Compustat, Compustat Bank and CRSP; and we collect compensation data from Execucomp dataset and 10-K filings. We ended up with a final sample of

526 firm-year observations over the period 2003-2009 generated by 81 unique financial institutions. Table 3.1 describes the distribution of observations over time. Out of 526 firm-year observations, about the 40% reports securitization transactions thus confirming that the use of securitization practices has been a concentrated phenomenon in the financial industry.

We hand collect data on banks' securitization activities from 10-K filings. Specifically, we use disclosure under SFAS 140 that requires institutions to provide information on securitized financial assets. In order to rule out the possibility that our analysis is driven by a size effect, we scale loans securitized by the amount of total loans managed by the bank (sum of total securitized and withheld loans) and create the variable Securitization. For financial institutions engaging in securitization transactions we also retrieve the amount of credit losses on securitized loans and we create a variable (Loss Secur) that computes the percentage of credit loss on securitized loans. We interpret this variable as a proxy of the riskiness of securitization transactions undertaken by the bank. Given that most losses on securitized assets have been recorded during the financial crisis, it is an essential feature of our research design to collect data until 2009 and not limiting the analysis to the pre-crisis period.

Similarly, we create a proxy of the riskiness of non-securitized loans (Loss Loans) defined as the percentage losses on loans withheld on balance sheet. Finally, we define a variable (Diff in Losses) that computes the difference between the percentage loss on securitized assets and the percentage loss on withheld loans. Thus, higher values of Diff in Losses indicate that executives transferred risk embedded in loans to outside investors through securitization.

Table 3.1. Sample distribution over time

Year	**# obs**
2003	80
2004	77
2005	78
2006	80
2007	81
2008	73
2009	67
Total	536

As emphasized by Core et al. (2003), executive incentives from stocks and options are properly measured only considering portfolio incentives. In fact, the amount of newly granted restricted stocks and options is not sufficient for evaluating the amount of incentives the executive is provided with (Yermack 1995). We measure CEO's equity incentives (Equity Incentives) as the dollar change in the value of executive's stock and option holdings that would come from a one percentage point increase in the company stock price. The sensitivity of CEO's stock holding is simply computed multiplying the number of shares held by the 1% of the stock price at fiscal year-end, while for computing the sensitivity of CEO's option holding we take the partial derivative of the Black-Scholes equation with respect to stock price (option's Delta). Starting from the fiscal year 2006, Execucomp reports all the information necessary for computing the sensitivity of CEO's equity portfolio to a one percentage point increase in the stock price. For observations preceding 2006 we use Core and Guay (2002)'s methodology for estimating the delta of executives' option portfolio. In particular, CEO's options are divided into three groups (options awarded during the year, options awarded in previous years but not yet exercisable and options granted in previous years and currently exercisable) and separate estimates of the delta are computed. Core and Guay (2002) show that their proxy captures more than 99% of the variation in option portfolio value and sensitivity. To reduce the influence of extreme values, in regression analyses we use the log transformation of Equity Incentives.

We measure CEO risk-related incentives (Risk Incentives) in a methodology similar to that used by Rogers (2002, 2005) and Grant et al. (2009), namely the Vega of CEO's stock options divided by their Delta. We compute CEO's option Vega as the sensitivity of CEO's option holding to a unit change in stock price volatility by using the first derivative of the Black-Scholes option-pricing model in relation to firm's volatility. When necessary, we used Core and Guay (2002)'s methodology to retrieve the data for computing options' Vega and Delta. Computing CEO's risk-incentives using the Vega-to-Delta ratio has the advantage of reducing multicollinearity problems between the sensitivity of CEO's equity portfolio to stock price and stock volatility that is particularly severe in small samples.

In the analysis we also control for the age of the CEO (Log Age). Including CEO's age in the analysis allows us to control for potential effects linked to CEO's career concerns that might influence securitization activities. The underlying idea is that career concerns are higher for young versus old managers since they have to influence market's beliefs about their ability (Holmström, 1999).

In an attempt to control for confounding variables that might influence the level of securitization observed, we include in the multivariate analysis a set of bank-related characteristics. B_M is the equity book-to-market ratio computed as the book value of equity divided by its market value at fiscal year-end; Returns is bank's annual market returns; Size is the natural logarithm of total assets; Change Assets is the percentage change in total assets with respect to the previous year as control for potential M&A activities; Change Tier 1 proxies for regulatory capital constraints and it is computed as the percentage change in Tier 1 with respect to the previous year; Interest Income is net interest income divided by total revenues as a proxy for bank business model; GDP is the gross domestic product that controls for macroeconomics trends that might influence securitization activities.

Distribution and correlation of key variables

Table 3.2, reports descriptive statistics of the main variables used in the analysis. Data on Securitization show that, on average, financial institutions in our final sample securitize about the 11% of managed loans. The highly asymmetric distribution of the variable is driven by a large part of observations taking value of zero because of no (or immaterial) securitization activities. When computed only considering banks involved in securitization transactions, untabulated results show that the average value of Securitization is 0.27 with banks in the 90th percentile securitizing an amount of loans equal to the 64% of the managed portfolio. Our research design aims at exploiting this variability in the data in order to analyze if CEO's incentives can explain part of it.

As expected, the (untabulated) correlation matrix shows that old CEOs and CEOs in large bank have higher levels of equity incentives than their colleagues that are in the early stage of the career or that guide small institutions. The level of equity incentives is also strongly positively correlated with bank's performance and growth opportunities while the relation reverses sign when examining risk incentives. On the contrary, large financial institutions provide CEOs not only with high levels of equity incentives but also with high risk incentives with respect to small banks.

Table 3.2. Descriptive statistics

	N	Mean	SD	p25	p50	p75
Securitization	536	0.105	0.203	0.000	0.000	0.102
Loss Secur	162	0.018	0.027	0.000	0.005	0.034

Loss Loans	536	0.009	0.018	0.001	0.003	0.008
Equity Incentives	536	963.6	1555	112.5	374.4	1122
Risk Incentives	536	0.902	0.719	0.399	0.771	1.205
Log Bonus	536	988.7	2365	0.000	8.128	848.0
Log Age	536	56.66	6.348	52.00	57.00	61.00
B_M	536	0.807	0.875	0.402	0.556	0.822
Returns	536	0.029	0.407	-0.124	0.087	0.234
Size	536	10.154	1.708	8.884	10.154	11.34
Change Assets	536	0.110	0.170	0.013	0.083	0.169
Tier 1 Constr	536	0.412	0.493	0.000	0.000	1.000

Research design and results

Our research hypotheses predict that CEO's equity incentives determine both the total amount of securitizations undertaken by financial institutions and the quality of loans securitized, while risk-related incentives only determine the securitization of risky loans.

To test the effect of equity compensation on banks' total securitization activities, we first group banks into quintiles according to the level of CEO's equity incentives and report the amount of securitization for each group of financial institutions. Table 3.3, shows that as one moves from the first to the fifth quintile of the distribution of CEO's equity incentives, the amount of loans securitized steadily increases, thus providing preliminary support for the role of CEO's equity incentives in boosting securitizations.

Table 3.3. Quintile distribution

		Securitization
Equity Incentives Quintile		*Mean*
Lowest		0.031
2nd quintile		0.070
3rd quintile		0.074
4th quintile		0.138
Highest		0.215
H_0: Lowest - Highest = 0		t = - 7.200
		p-value = 0.000

To better investigate our research question, we estimate the following Tobit model with year fixed effects and heteroskedasticity-robust standard errors clustered at firm-level:

$$\text{Securitization} = \beta_0 + \beta_1 \text{ Equity Incentives} + \beta_2 \text{ Risk Incentives} + \beta_3 \text{ Log Age} + \beta_4 \text{ B\_M} + \beta_5 \text{ Returns} + \beta_6 \text{ Size} + \beta_7 \text{ Change Assets} + \beta_8 \text{ Change Tier 1} + \beta_9 \text{ Interest Income} + \beta_{10} \text{ GDP} + \varepsilon \quad (1)$$

Our research hypotheses predict a positive and significant β1 and an insignificant β 2. When estimating (1), it is necessary to use a censored regression model because Securitization takes the value of zero for a large part of the sample and it is a continuous random variable over strictly positive values. As a consequence a linear model would not work properly (Wooldridge, 2002).

The results from equation (1), reported in columns 1 in Table 3.4, strongly support our hypothesis by documenting a positive and significant relation between securitization and CEO's equity incentives; while no relation is detected between securitization and CEO's risk incentives. Given the variability in the distribution of the dependent variable, it could be argued that results might be partially driven by some extreme observations. In order to address this concern, we divide our sample in three groups and mark them with an ordering variable taking the value of:

- 1 if the bank does not engage into securitizations;
- 2 if the bank engages into securitizations and Securitization is below the sample median of securitizing institutions;
- 3 if the bank engages into securitizations and Securitization is above the sample median of securitizing institutions.

We then fit equation (1) using an ordered probit model and present results in columns 2 of Table 3.4, Panel B. The advantage of using this approach is that results cannot be driven by few outliers; nonetheless the use of an ordering variable reduces information available in the data. Column 3, instead, fits model (1) excluding observations in years 2008 and 2009. This additional analysis takes into consideration the fact that the securitization market greatly reduced after 2007, because of the advent of the financial crisis. Also these alternative model specifications provide strong support for our research hypothesis, suggesting that CEOs with high equity incentives have engaged in securitization transactions to a larger extent than CEOs whose wealth was less tightly linked to shareholder value.

Results from Table 3.4 also show that banks with higher book-to-market ratios engage more in securitizations than financial institutions with lower book-to-market ratios. A possible explanation is that these banks have higher

incentives to securitize loans because they have lower growth opportunities and thus more difficulties in collecting funds. Data also show that old CEOs undertake less securitizations than their young colleagues, and this is consistent with young managers having higher career concerns and thus trying to boost shareholder value through securitizations to a larger extent.

Table 3.4. Multivariate analysis

	Securitization	**Securitization**	**Securitization**
	Continuous variable	Three Groups	Until 2007
	Tobit	**Ordered Probit**	**Tobit**
	(1)	**(2)**	**(3)**
Equity Incentives	0.072***	0.217***	0.095***
	[0.026]	[0.083]	[0.032]
Risk Incentives	0.026	0.069	0.017
	[0.044]	[0.142]	[0.060]
Log Age	-1.081***	-3.090***	-1.078***
	[0.366]	[1.036]	[0.391]
B_M	0.081**	0.268**	0.235*
	[0.033]	[0.118]	[0.127]
Returns	0.030	0.089	0.002
	[0.045]	[0.153]	[0.106]
Size	0.098***	0.412***	0.079***
	[0.024]	[0.077]	[0.029]
Change Assets	0.019	0.015	0.032
	[0.118]	[0.410]	[0.122]
Change Tier 1	0.043	0.136	0.008
	[0.076]	[0.257]	[0.104]
Interest Income	-0.355	-0.886	-0.339
	[0.226]	[0.828]	[0.255]
GDP	-0.076	-0.096	-0.145
	[0.151]	[0.448]	[0.088]

Year Dummies		YES		YES		YES
Observations		526		526		387
(Pseudo) R^2		40.6%		25.7%		40.7%

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

A possible concern that might arise when estimating equation (1) relates to the fact that CEO's equity and risk incentives can be endogenous with respect to banks' decision of engaging into securitizations. This is the case if exogenous shocks to the regression residuals affect both CEO's compensation structure and securitization strategies. Moreover model (1) might be affected by a reverse causality bias. To address this problem, we use an instrumental variable (IV) approach. It is well known that the challenge faced by researchers when dealing with IV models is to identify valid and strong instruments. These are variables that are strongly correlated with the endogenous variable under investigation but that are not correlated with the error term in the second stage equation. In order to identify such an instrument we exploit a change in US GAAP that took place in 2000. Here it is important to note that i) the securitization business model and ii) the subprime securitization market, developed thanks to the possibility offered by SFAS 140 to retain interests in securitized assets as credit enhancement mechanism and applying sale accounting to the transferred assets. This was possible thanks to the Financial Components Concept included in SFAS 140. Without this concept most securitizations would have to be accounted for as secured borrowing. The Financial Components Concept has been introduced in 2000 by SFAS 140 while the prior SFAS 125, Accounting for Transfers and Servicing of Financial Assets and Extinguishment of Liabilities (1996) did not contain this provision. As a consequence, the recent securitization and subprime business model investigated in the paper has emerged after this change in accounting standards. Data reported in Table 3.5 document that after the discussed change in accounting standards in 2000, the securitization market sharply increased, specifically the subprime securitization market was almost non-existing beforehand. Thus, we use as instrument for CEO's equity and risk incentives during the period 2003-2009 the level of equity and risk incentives that the same CEO had before 2000. The level of incentives held by the CEO in the same bank (or in the other banks/firms in which she has served) before 2000 is likely to be correlated with her future level of incentives but cannot be correlated with a securitization business model that did not exist.

Table 3.5. Securitization of Home Mortgages pre and post 2000

Year	Prime MBS	Subprime MBS	Total MBS
1997	423	66	489
1998	860	83	943
1999	777	60	837
2001	1,246	98	1,345
2002	1,641	176	1,817
2003	2,393	269	2,662
2004	1,306	521	1,827
2005	1,314	797	2,112
2006	1,202	814	2,016
2007	1,372	433	1,804

Dollars in Billions. Source: Inside Mortgage Finance Publication

Table 3.6 presents results from estimating model (1) using a two-stage least squares (2SLS) approach. The high R2 reported in the first stage (untabulated) suggest that variables included in the model are good predictors of the endogenous variables. Results from the second stage strongly corroborate findings reported in Table 3.4 and thus confirm the support to our research hypothesis.

We now move the focus of the analysis from banks' overall securitization activity to the quality of loans securitized and banks' decision to transfer risks to outside investors through securitization.

Table 3.7 provides univariate support for our hypothesis that CEO's equity and risk incentives motivate executives to securitize low-quality assets and transfer risk to outside investors through securitization. Specifically, we divide the sample into four groups according to the median value of CEO's equity and risk incentives (High vs Low). Table 3.7, Panel A tabulates the mean values of the percentage loss on securitized loans (Loss Secur) for each level of CEO's incentives while Panel B tabulates the difference between the percentage loss on securitized loans and withheld loans (Diff in Losses). We interpret the first metric as a proxy of the riskiness of loans securitized because risky securitized loans are more likely to suffer credit losses. The second metric, instead, investigates the opportunistic behavior of CEOs when engaging into securitizations, because it compares the losses recorded on loans transferred off-balance with

losses on loans withheld in the balance sheet. Data from Table 3.7, Panel A indicate that financial institutions in which the CEO had high equity and risk incentives (group High/High) engaged in risky securitization transactions to a larger extent than banks in which the CEO had low incentives (group Low/Low). Similarly, Panel B shows that CEOs with high equity and risk incentives are more likely to transfer risk to outside investors than CEOs with low incentives as documented by the significantly higher value of Diff in Losses in the group High/High w.r.t. the group Low/Low.

Table 3.6 An instrumental variable approach

	Securitization	**Securitization**	**Securitization**
	Continuous variable	Three Groups	Until 2007
	Tobit IV	**Ordered Logit IV**	**Tobit IV**
	(1)	**(2)**	**(3)**
Equity Incentives	0.156**	0.606***	0.163**
	[0.062]	[0.229]	[0.072]
Risk Incentives	0.222	0.540	0.191
	[0.316]	[0.930]	[0.322]
Log Age	-1.329***	-4.317***	-1.329***
	[0.412]	[1.217]	[0.508]
B_M	0.087*	0.355**	0.209
	[0.046]	[0.166]	[0.252]
Returns	0.060	0.040	0.304*
	[0.122]	[0.375]	[0.159]
Size	0.040	0.205	0.029
	[0.055]	[0.171]	[0.058]
Change Assets	-0.045	-0.367	-0.023
	[0.164]	[0.534]	[0.204]
Change Tier 1	0.027	0.070	-0.095
	[0.074]	[0.252]	[0.107]
Interest Income	-0.337	-0.644	-0.344
	[0.273]	[0.914]	[0.329]

GDP			-0.299		-0.854		-0.004
			[0.294]		[0.845]		[0.041]
Year Dummies			YES		YES		YES
Observations			526		526		387
(Pseudo) R^2			39.8%		26.3%		37.5%

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

In order to better disentangle the effect of CEO's equity and risk incentives on the quality of loans transferred off-balance through securitization we estimate the following model through 2SLS:

$$\text{Loss Secur (Diff in Losses)} = \beta_0 + \beta_1 \text{Equity Incentives} + \beta_2 \text{Risk Incentives} + \beta_3 \text{Log Age} + \beta_4 \text{B\_M} + \beta_5 \text{Returns} + \beta_6 \text{Size} + \beta_7 \text{Change Assets} + \beta_8 \text{Change Tier 1} + \beta_9 \text{Interest Income} + \beta_{10} \text{GDP} + \beta_{11} \text{Loss Loans} + \varepsilon \quad (2)$$

Estimate results using Loss Secur as dependent variable are reported in Table 3.8, Columns 1 while Columns 2 reports results from using Diff in Losses as dependent variable. The coefficients on Equity Incentives and Risk Incentives in the first column of the table indicate that CEOs with high equity and risk incentives tended to securitize risky loans that are more likely to record credit losses. Moreover, results from the second column provide evidence that equity and risk incentives motivated CEOs to transfer the riskiest loans to outside investors while keeping on balance sheet the safest ones. These results are consistent with our research hypothesis claiming that CEOs incentivized on equity and risk were motivated to engage in risky lending activities and to use securitization as an accounting tool for hiding the risk generated from the balance sheet. Thus, the analysis provides evidence that CEO's equity and risk incentives motivated executives to opportunistically clean their balance sheets from undesired risks through securitization. Ex post, it is possible to affirm that securitization practices were effective in hiding the risks undertaken by CEOs, since neither banks' investors nor analysts were able to understand the risks embedded in securitization transactions and in the underlying lending activity.

Table 3.7 Incentives and risk-taking

Panel A		**Loss Secur**	
		Mean	
N= 162		*Risk Incentives*	
		High	*Low*
Equity Incentives	*High*	**0.031**	**0.017**
	Low	**0.017**	**0.009**
H_0: (High/High) = (Low/Low)		**t = 3.301**	**p-value= 0.002**
Panel B		**Diff in Losses**	
		Mean	
N= 162		*Risk Incentives*	
		High	*Low*
Equity Incentives	*High*	**0.017**	**0.006**
	Low	**0.003**	**0.003**
H_0: (High/High) = (Low/Low)		**t = 2.402**	**p-value= 0.020**

Results from the previous analyses suggest that CEO's equity incentives are both a determinant of banks' overall securitization activities and the riskiness of securitized loans, while CEO's risk incentives only determine the risk profile of securitization. We further investigate this point by retrieving data on financial institutions most involved in the securitization of subprime loans. Subprime loans are made to those who have impaired credit and their securitization is the riskiest form of securitization transactions undertaken by financial institutions. Typically, subprime borrowers have low credit ratings and a reasonable chance

of defaulting on the debt repayment: as a consequence, financial institutions charge significantly higher rates on subprime loans than prime mortgages. This allowed banks to increase their profits from the lending activity and also provided banks with high incentives to include these loans in securitization transactions in order to transfer the associated high risk to outside investors. We retrieve data on the top subprime securitizers from the Mortgage Market Statistical Annual edited by Inside Mortgage Finance Publications. We have data on top subprime securitizers for the period 2000-2007. Even if the Mortgage Market Statistical Annual only reports data for the top financial institutions involved in subprime securitizations, it has a very wide coverage of the securitization market with top subprime securitizers disclosed in the dataset covering more than the 80% of overall subprime market. We define a dummy variable (Top Subprime) taking the value of 1 if the financial institution is listed in the Mortgage Market Statistical Annual as top subprime securitizer at least once during the period analyzed, zero otherwise. Table 3.9, Panel A compares the percentage of top subprime observations according to the level of CEO's equity and risk incentives. Two-sample tests of proportion indicates that, in the presence of high CEO's equity and risk incentives the percentage of top subprime securitizers is significantly higher than in the presence of low CEO's incentives.

Table 3.8. Quality of loans transferred off-balance

Dependent Variable:	**Loss Secur**	**Diff in Losses**
	2SLS	2SLS
	(1)	**(2)**
Equity Incentives	0.008**	0.007**
	[0.004]	[0.003]
Risk Incentives	0.025**	0.025**
	[0.011]	[0.011]
Log Age	-0.064***	-0.060***
	[0.022]	[0.020]
B_M	-0.000	-0.000
	[0.001]	[0.001]
Returns	0.001	0.002
	[0.007]	[0.007]

Size		-0.002		-0.002
		[0.004]		[0.004]
Change Assets		0.014		0.018
		[0.014]		[0.013]
Change Tier 1		0.019		0.019
		[0.011]		[0.011]
Interest Income		0.003		0.008
		[0.020]		[0.019]
GDP		-0.010**		-0.012**
		[0.005]		[0.004]
Loss Loans		0.812***		
		[0.202]		
Year Dummies		YES		YES
Observations		162		162
R^2		43.6%		19.0%

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Table 3.9 Equity incentives, risk incentives and suprime securitization

		% Top Subprime	
		Risk Incentives	
		High	*Low*
Equity Incentives	*High*	**46%**	**38%**
	Low	**16%**	**0%**
H_0: (High/High) = (Low/Low)		**z = 5.550**	**p-value < 0.000**

To investigate in a multivariate setting if CEO's equity and risk incentives increase banks' probability of being a securitizer of subprime loans we estimate model (1) through 2SLS using as dependent variable the dummy Top Subprime above defined:

$$\text{Top Subprime} = \gamma_0 + \gamma_1 \text{Equity Incentives} + \gamma_2 \text{Risk Incentives} + \gamma_3 \text{Log Age} + \gamma_4 \text{B\_M} + \gamma_5 \text{Returns} + \gamma_6 \text{Size} + \gamma_7 \text{Change Assets} + \gamma_8 \text{Change Tier 1} + \gamma_9 \text{Interest Income} + \gamma_{10} \text{GDP} + \varepsilon \quad (3)$$

Estimate results are reported in Table 3.10. Column 1 presents results for the full sample, column 2 restricts the sample to 2007, column 3 uses the full time period but tabulate results using only securitizing banks, and the last column uses securitizing financial institutions only and restricts the sample to 2007. Results on CEO's equity and risk incentives corroborate findings from panel A and suggest that CEOs with high equity and risk incentives are more likely to engage in the securitization of subprime loans than executives with low incentives. Therefore, results support our research hypothesis pointing out to the pivotal role of CEO's equity and risk incentives in boosting risky securitizations.

Table 3.10. Multivariate analysis on the role of compensation in determining risk-taking

	Top Subprime	**Top Subprime**	**Top Subprime**	**Top Subprime**
	Full Sample	Full Sample Until 2007	Only Securitizers	Only Securitizers Until 2007
	2SLS	2SLS	2SLS	2SLS
	(1)	**(2)**	**(3)**	**(4)**
Equity Incentives	1.065***	0.936***	0.915***	0.911**
	[0.361]	[0.331]	[0.298]	[0.387]
Risk Incentives	3.797***	3.535**	2.708**	3.460*
	[1.471]	[1.714]	[1.284]	[1.845]
Log Age	-1.908	0.114	-0.643	0.216
	[2.550]	[2.149]	[2.201]	[2.825]
B_M	-0.051	1.868***	-0.102*	2.590**
	[0.052]	[0.715]	[0.060]	[1.143]

Returns	1.109*	1.840**	0.794	3.048**
	[0.640]	[0.872]	[0.695]	[1.232]
Size	0.271	0.602***	0.467**	0.487**
	[0.243]	[0.205]	[0.221]	[0.205]
Change Assets	0.099	0.848	0.835	0.071
	[0.812]	[0.937]	[0.912]	[1.183]
Change Tier 1	0.470	-0.569	1.383*	0.330
	[0.607]	[0.554]	[0.715]	[0.850]
Interest Income	-0.247	-0.620	0.644	-0.761
	[1.566]	[1.535]	[1.724]	[1.688]
GDP	-4.474***	-2.838**	-4.855***	-1.925*
	[1.305]	[1.355]	[1.621]	[1.096]
Year Dummies	YES	YES	YES	YES
Observations	526	387	208	163
Pseudo R^2	61.8%	68.4%	50.1%	58.6%

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

In order to further investigate the opportunistic behavior of highly incentivized CEOs when engaging into securitizations, we analyze bank's disclosure about the amount of losses recorded by loans that have been transferred off-balance. SFAS 140 explicitly requires an entity that securitizes financial assets to disclose information about the quality of securitized assets, including the amount of credit losses. Specifically, we investigate if CEOs with high equity and risk incentives not only engaged in risky securitization transactions but also hid the quality of loans securitized by providing external investors with less information about the riskiness of securitizations undertaken. For doing so we analyze the disclosure provided by financial institutions in their financial statements and score the quality of information on losses recorded on securitized loans on a 4-points scale as follows (Disclosure Index):

- 4 points if the amount of losses on securitized assets is disclosed in a table and the information is provided for each type of securitized asset (e.g. mortgages, credit cards etc…);
- 3 points if the amount of losses on securitized assets is disclosed in a table but the information is only provided at an aggregate level;
- 2 points if the amount of losses on securitized assets is not disclosed in

a table and it has to be indirectly retrieved from information provided in the financial statements;

- 1 point if it is not possible to understand the amount of losses on securitized assets.

Table 3.11. Disclosure

	Disclosure Index
	2SLS
Equity Incentives	0.134
	[0.105]
Risk Incentives	-1.857**
	[0.731]
Log Age	-0.608
	[1.553]
B_M	0.216*
	[0.128]
Returns	-0.593
	[0.584]
Size	0.324**
	[0.143]
Change Assets	-2.897***
	[0.746]
Change Tier 1	-0.925
	[0.634]
Interest Income	-0.335
	[1.431]
GDP	4.349***
	[1.638]
Year Dummies	YES
Observations	208
Pseudo R^2	8.2%

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

The median value of the Disclosure Index is 2.21 with a standard deviation of 1.06. In order to investigate the role of CEOs equity and risk incentives on the quality of information provided to investors, we estimate the following ordered probit model through 2SLS:

$$\text{Disclosure Index} = \delta_0 + \delta_1 \text{ Equity Incentives} + \delta_2 \text{ Risk Incentives} + \delta_3 \text{ Log Age} + \delta_4 \text{ B\_M} + \delta_5 \text{ Returns} + \delta_6 \text{ Size} + \delta_7 \text{ Change Assets} + \delta_8 \text{ Change Tier 1} + \delta_9 \text{ Interest Income} + \delta_{10} \text{ GDP} + \varepsilon \quad (4)$$

Estimate results are reported in Table 3.11. The coefficient on CEO's risk incentives is negative and significant indicating that CEOs with high risk incentives not only securitized risky loans to a larger extent than CEOs with lower incentives, but they also provided external investors with lower information about the quality of loans securitized. On the contrary, we do not find the same effect when examining CEO's equity incentives. This last result nicely fits with findings from Table 3.6 suggesting that CEO's equity incentives, contrary to risk incentives, determine overall securitization activity and not only the securitization of risky loans. Results reported in Table 3.11 further confirm the opportunistic behavior of CEOs when they engage into securitization transaction, motivated by the structure of their incentive scheme.

3.12. Market returns, earnings per share and dividends of securitizing banks

	Market Returns	**EPS**	**Dividends**
	(1)	**(2)**	**(3)**
Crisis	-0.176***	-0.966***	0.041
	[0.023]	[0.337]	[0.043]
Top Subprime	0.107***	2.068***	0.341*
	[0.036]	[0.526]	[0.178]
Top Subprime * Crisis	-0.158*	-2.801**	0.189
	[0.080]	[1.331]	[0.141]
B_M	-0.192***	-1.428***	-0.127***
	[0.026]	[0.335]	[0.035]
Size	-0.030**	0.087	0.186***
	[0.013]	[0.116]	[0.038]

Change Assets	0.124	1.633*	-0.582***
	[0.079]	[0.828]	[0.141]
Change Tier 1	0.219***	1.038	0.017
	[0.082]	[0.669]	[0.098]
Interest Income	0.029	0.156	0.689***
	[0.129]	[0.955]	[0.233]
Securitization	0.071	0.462	-0.310
	[0.063]	[0.908]	[0.234]
Observations	526	526	526
R^2	34.8%	39.8%	39.3%

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Finally, we test if banks involved in the subprime securitization indeed over performed other financial institutions before the crash of the subprime market in 2007 and if this relation changed once the subprime crisis has blew up. To shed light on this issue, we analyze how stock returns and earnings per share of top subprime securitizers changed before and after 2007, with respect to other financial institution. Specifically, we fit the following OLS model in which the variable Crisis is a dummy that takes the value of 1 in years 2007-2009, zero otherwise, and Performance is either annual market returns or earnings per share (EPS).

$$\text{Performance} = \lambda_0 + \lambda_1 \text{ Crisis} + \lambda_2 \text{ Top Subprime} + \lambda_3 \text{ Crisis*Top Subprime} + \lambda_4 \text{ B\_M} + \lambda_5 \text{ Size} + \lambda_6 \text{ Change Assets} + \lambda_7 \text{ Change Tier 1} + \lambda_8 \text{ Interest Income} + \lambda_9 \text{ Securitization} + \varepsilon \quad (5)$$

Estimate results are reported in Table 3.12, Columns 1 and 2. The positive and significant coefficient on Top Subprime indicates that subprime securitizers, before 2007, have performed much better than the other financial institutions. The negative coefficient on the dummy marking years 2007-2009 confirms the strong reduction in market returns and earnings recorded by all financial institutions with the advent of the credit crisis. Interestingly the interaction term between Top Subprime and the crisis dummy is negative and significant, thus suggesting that the decrease in performance after 2007 has been more severe for banks that had engaged in the securitization of non-agency loans. These

results further corroborate the role of subprime securitization in boosting stock prices and earnings before the advent of the subprime mortgage crisis and in deteriorating performance once the market has crashed. Finally, Table 3.12, Column 3 analyzes dividend distribution. This analysis is particularly interesting since dividend polices represent the core of the shareholder-bondholder conflict, which is exacerbated in the presence of incentives that align executives' interests with those of shareholders. Results indicate that subprime securitizers distributed more dividends than other financial institutions before the beginning of the crisis while they did not reduce dividend distribution on the immediately subsequent period. Overall, results presented are in line with the idea that the securitization of risky loans has allowed banks and shareholders to pursue their private interest while accumulating and hiding risks that ex-post have been paid by the whole system.

Final remarks

In this chapter we empirically investigate the role of CEO's equity and risk-related incentives in boosting securitization activities and in transferring risk to outside investor through the securitization of risky loans.

Using a sample of US financial institution over the period 2003-2009, we document that CEOs with high equity incentives systematically engaged in securitization transactions to a larger extent than CEOs with low equity incentives. We also show that CEOs with high equity and risk-related incentives engaged more in risky securitization activities than CEOs with low incentives and transferred risk to outside investors by moving off-balance the riskiest loans. Moreover, we show that executives incentivized on risk provided outside investors with a low quality disclosure about losses recorded on loans that were securitized thus contributing to increase the opacity of transactions undertaken. We interpret these results as evidence that highly incentivized CEOs saw securitization as a useful tool to enhance banks' profits and stock price. Moreover, we argue that risk-incentivized executives saw in securitizations an opportunity to hide the risks generated while betting on them.

In additional analyses we document that subprime securitizers over-performed the peers before the market crash in 2007 while they underperformed other financial institutions once the subprime market collapsed. Moreover, subprime securitizers were able to distribute more dividends than the other financial institutions. Overall, our results speak to the role of equity and risk incentives in motivating CEOs to engage in securitization activities and show that these widely used incentive tools had the consequences of boosting financial transactions that turned out to be extremely costly.

Our contribution, therefore, adds to the large stream of research warning about possible side effects of equity compensation and uncovers a determinant of securitization transactions that has been overlooked by previous literature.

Chapter 4
Compensation Structure for Non-CEO Executives

This chapter analyzes the compensation structure of non-CEO executives. Most of the evidence reported on executive compensation is based on the compensation scheme designed for the CEO. The underlying assumption is that once we understand the determinants of the compensation of the CEO, all first-order effects are considered. In this chapter, we move the focus to non-CEO executives and show that not all effects are subsumed by the compensation structure of the manager that covers the highest role in the firm.

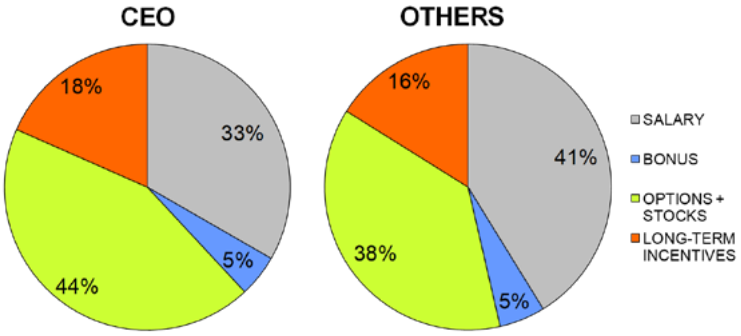
Non-CEO executives, firm value, top executive team, equity incentives

Non-CEO executives and equity compensation

Many scholars have investigated the composition of top executive compensation and have studied how different structures of executive compensation influence firms' performance and value (Core et al., 2003; Fong, 2009; Hogan and Lewis, 2005; Murphy, 1985; Murphy, 1999; Wallace, 1997). Most contributions in the literature focus on the chief executive officer (CEO) because of the underlying assumption that studying CEO's compensation clarifies all first-order effects. This viewpoint has been challenged by a few studies (e.g., Bushman et al., 1995; Indjejikian and Matejka, 2009; Jiang et al., 2010; Kim et al., 2011) that investigate the compensation structure of some non-CEO executives, such as the chief financial officer (CFO). Figure 4.1 uses data for year 2009 from Execucomp and tabulates the composition of executive compensation in SP500 firms distinguishing between CEO and non-CEO executives. Interesting, although similarities exist, the figure shows that firms do not design the compensation

contract for non-CEO executives simply by copying and rescaling the compensation policies used for the CEO.

Figure 4.1. The composition of compensation for non-CEO executives



Source: Our elaborations

This chapter analyzes the economic determinants and the effects on the firm's value of the compensation structure of non-CEO executives to understand to which extent it is true that once the compensation structure of the CEO is accounted for, all first-order effects are explained.

To tackle this research question, we focus on the chief marketing officer (CMO), a top executive that, to the best of our knowledge, has never been studied from this perspective. The marketing literature has documented theoretically (Srivastava et al., 1998; Srivastava et al., 1999) and empirically (Srinivasan and Hanssens, 2009) a strong and positive relationship between marketing activities and shareholder value. As a consequence, the CMO, who is in charge of managing all variables related to the marketing mix, is likely to play a central role in influencing the firm's performance. Therefore, we argue that considering the CMO's compensation is essential to gain a complete picture of the effects of executive compensation on the firm's value. In fact, although there is a large body of literature that suggests the importance of marketing activities and processes in sustaining and creating firm's value, we know nothing about how the top executive in charge of managing these activities is incented. The purpose of this study is to fill this gap by focusing on the equity incentives that have become executives' most important compensation component (Core et al., 2003). Using a sample of 586 firm-year observations over the period 2000-2009 and a two-stage Heckman model approach, the study documents three important features of CMO's compensation. First, when a firm's marketing intensity increases, the CMO's equity incentives significantly increase. Second, CMO's equity incentives are positively related to shareholder value, and this positive relationship

is incremental to that between the CEO's incentives and firm's value. Third, the positive impact of the CMO's equity incentives on the firm's value is not limited to firms that invest in marketing more than the industry average, which finding suggests a strategic role for the CMO that is not simply linked to managing the marketing budget. These results suggest that the CMO's compensation structure cannot be considered only a second-order effect, and its effects on the firm's value deserves to be analyzed: specifically, moving from the first to the second quartile of CMOs' equity incentives, the average Tobin's q increases by 7 percent. This effect is economically significant but is not too high to appear unrealistic. More important, this result is incremental to the positive effect of CEO's equity incentives on the firm's value that the literature has already documented.

This study contributes to extant literature in several ways. First, it adds to the traditional research stream that investigates executive compensation and equity incentives. To the best of our knowledge, this study is the first to analyze the structure and effect on value of the CMO's compensation in answer to Bushman and Smith's (2001) call for research on compensation of executives other than CEOs. Second, the study adds to the literature that investigates the role of marketing in delivering shareholder value: given the established link between marketing activities and shareholder value, the study explores the effect on firm value of the incentives provided to the executive in charge of managing marketing processes. This study is also linked to Nath and Mahajan's (2008) investigation, which analyzes the effect on performance of the CMO's being in the top management team. Nath and Mahajan (2008) find no support for the hypothesis that the CMO's being in the top management team improves corporate performance, but by moving the focus of the analysis from the mere presence/absence of the CMO in the top management team to the CMO's compensation structure, we find strong support for the CMO's strategic role in the company. Finally, by showing that the positive effect on value of the CMO's equity incentives is not conditioned on the firm's marketing investments, this study also supports the idea that marketing has a strategic role that goes well beyond simply organizing marketing campaigns and market research, so it provides support for the idea that marketing strategically contributes to the planning process and to the creation of market-based assets (Anderson, 1982; Srivastava et al., 1998).

Prior literature on non-CEO executives

Equity incentives are among the mechanisms companies use most frequently to alleviate agency problems between managers and shareholders (Core et al., 2003; Lambert, 2001; Murphy, 1999). Equity incentives, which increase in value

when the firm's stock price rises, are designed to incent managers to work to increase the stock price. Many studies have investigated the relationship between the level of executives' equity incentives and firm performance, but results are diverse (Core et al., 2003). Some authors (e.g., Frye, 2004; Hanlon et al., 2003; McConnell and Servaes, 1990; Morck et al., 1988) document a positive association between the CEO's equity ownership and firm performance, suggesting that CEOs with high equity ownership are closer to optimal incentive levels than CEOs with low equity holding. Other authors claim that, on average, equity incentive levels are set optimally, so a positive relationship between the CEO's equity incentives and firm performance is not obvious (Core et al., 2003). Virtually everything we know about executives' incentives is based on the analysis of the CEO's compensation structure. A few studies (e.g., Indjejikian and Matejka, 2009; Jiang et al., 2010; Kim et al., 2011) investigate the compensation structure of the Chief Financial Officer (CFO) or that of business-unit managers (Bushman et al., 1995), but most contributions do not consider the effect of compensation of executives other than that of the CEO. The focus on the CEO is justified by the belief that the board of directors, and in particular the compensation committee, is likely to put considerable effort in optimally setting the CEO's incentives, and the incentives for other top executives are set accordingly. Therefore, the CEO's compensation is supposed to explain all first-order effects, and the incremental effect of non-CEO executives' compensation is deemed insignificant.

It is surprising that the CMO's compensation structure and incentive level has never been investigated, particularly considering the number of contributions in the marketing literature that establish a positive and robust link between marketing processes and firm value. Two relatively recent research streams in marketing literature empirically investigate the contribution of marketing to the creation of value for shareholders: one that analyzes marketing activities like advertising (Grullon et al., 2004; Joshi and Hanssens, 2004; McAlister et al., 2007; Srinivasan et al., 2009), promotions (Pauwels et al., 2004), distribution choices (Geyskens et al., 2002), and new product introduction (Chaney et al., 1991; Kelm et al.,1995; Pauwels et al., 2004; Sorescu et al., 2007; Srinivasan et al., 2009), and the other that focuses on marketing assets, such as: brand equity (Madden et al., 2006), customer equity (Gupta et al., 2004), customer satisfaction (Anderson et al., 2004; Fornell et al., 2006), and product quality (Aaker and Jacobson,1994; Srinivasan et al., 2009; Tellis and Johnson, 2007). These contributions, which empirically document that marketing strategies play a core role in creating shareholder value, can be contextualized in the theoretical framework proposed by Srivastava et al. (1998, 1999), who argue that marketing creates

shareholder value by i) accelerating cash flows; ii) enhancing cash flows by increasing revenues and reducing costs, working capital, and fixed investments; iii) reducing the risk associated with cash flows; and iv) increasing the firm's long-term value (terminal value). Thus, Srivastava et al. (1998, 1999) posit a powerful relationship between market-based assets (like customer and partner relationships), market performance, and shareholder value.

All these contributions show that marketing plays a central role in creating shareholder value, so it is of interest to both academics and practitioners to clarify how companies incent their CMOs and the effect of the CMO's equity incentives on shareholder value.

Determinants and consequences of non-CEO equity incentives

As Core et al. (2003) point out, the equity-based incentives of employees and executives below the CEO level have increasing less important roles as the managers' actions have increasing less effect on stock prices. This view is consistent with the well-known informativeness principle proposed by Holmstrom (1979), which proposes that any observable signal that reveals on the margin information about the level of a manager's efforts should be included in the contract. Specifically, it is useful to remunerate non-CEO executives using equity grants only if these managers can influence the stock price through their actions and decisions. If the manager has a role that does not allow him or her to have any significant impact on the stock price because there is a weak causal relation between his or her actions/decisions and the firm's value, the executive will not be motivated by holding equity in the firm. On the contrary, these firms could experience higher costs because they have to compensate managers for the risk they take when part of their fixed salary is substituted with components like stock and option grants. CMOs should have more potential to influence the stock price in firms that invest more in marketing than in firms that invest less, so we expect that firms characterized by higher marketing intensity use equity compensation for their CMOs to a larger extent than firm that are not. In fact, these firms are more likely to perceive stock price as an informative signal of CMO's efforts. Therefore, we hypothesize that as firms' marketing intensity increases, the CMO is given more equity incentives.

The second part of the analysis explores whether CMOs' equity incentives have a positive impact on firm value that is incremental to that of the CEO. Equity incentives align executives and shareholders' interests and lead executives to have a long-term orientation since their wealth is tightly linked to the future value of the company. The marketing literature has established a positive link between marketing processes and firm value. To create market-based assets,

the CMO must have a long-term orientation because these assets require large marketing investments in the current period that are rewarded only in the future (Srivastava et al., 1998, 1999). Therefore, only marketing managers who are focused on the company's future value will be willing to sacrifice current profits to investments in market-based intangible assets, while a CMO with a relatively short time horizon will prefer to invest in promotion activities with short-term payoffs. Such promotions have been shown to boost revenues only temporarily, without improving long-term financial performance and firm value (Pauwels et al., 2004). Anderson (1982) argues that marketing may also play a core role in the process of strategy formulation, in setting clear objectives, and in supporting a long-run orientation in the decision-making process. When CMOs are incented based on the long-term value of the firm, they are likely to be willing to contribute to strategic development with potentially high benefits for shareholders. Therefore, we hypothesize that the level of the CMO's equity incentives is positively related to shareholder value, after controlling for the CEO's equity incentives.

Results from an empirical investigation

As Core et al. (2003) emphasize, executives' incentives from stocks and options are properly measured only considering portfolio incentives, so newly granted restricted stocks and stock options are not sufficient for evaluating the incentives with which the executive is provided (Yermack, 1995). We measure CMOs' equity incentives (CMO_INCENTIVE) by means of the incentive ratio, as computed in Bergstresser and Philippon (2006, p. 519-520). This metric measures the power of a CMO's equity-based incentives as the dollar change in the value of the executive's stock and option holdings that would come from a one percentage point increase in the company's stock price. This measure of incentive is then standardized by the amount of cash compensation (base salary and annual bonuses) the executive receives during the year. Data are from Execucomp database for the period 2000-2009.

In order to compute the Delta of CMO's holdings, we follow Core and Guay's (2002) methodology for estimating the delta of executives' option portfolios. CMO's options are divided into three groups, and separate estimates of the delta are computed. The first group is made by options awarded during the year; for these options Execucomp reports all necessary information for computing the sensitivity of stock options to a one percent change in stock price. The second group is made by options awarded in previous years that are not yet exercisable, and the third group is made by options granted in previous years that are currently exercisable. For the second and third group of options, Core

and Guay (2002) develop and empirically test a methodology for approximating the sensitivity of these options to stock price changes, since the necessary information for the calculation is not readily available. Core and Guay (2002) show that their proxy captures more than 99 percent of the variation in option portfolio value and sensitivity. Similar to Nath and Mahajan (2008), we deem an executive to be the CMO of the company if his or her title includes the term "marketing" (Execucomp item "titleann").Titles of these executives include, but are not limited to, CMO and Vice President Marketing.

We also compute CEO's equity incentives (CEO_INCENTIVE) using the same methodology above described but considering CEO's stock and option grants. Finally, we create a variable that computes the difference in equity incentives between the CMO and the other non-CEO executives (DIFF_OTH). The incentive ratio for the other non-CEO executives (OTH_INCENTIVE) is the median incentive ratio of all non-CEO and non-CMO executives for whom the company discloses compensation data in the proxy statement.

As regards the proxy for measuring shareholder value, this paper uses the Tobin's q, defined as the ratio between the market value of a firm's assets and their replacement cost. The Tobin's q is a metric of shareholder value commonly used in the accounting and finance literature (e.g., Daske et al., 2008; Lang and Stulz, 1993; Servaes, 1991), as well as in marketing and management literature (e.g., Rao et al., 2004; Simon and Sullivan, 1993; Youndt et al., 2004). Higher values of Tobin's q reflect differences in expected discount rates and/or differences in expected future cash flows or growth expectations. Following Daske et al. (2008) and Doidge et al. (2004), the Tobins'q is computed as (total assets – book value of equity + market value of equity) scaled by total assets.

To measure marketing intensity, we first compute marketing investment as the annual amount of advertising and R&D expenditures and, following a common practice in marketing literature (McAlister et al., 2007), standardize this amount by the firm's annual sales. As McAlister et al. (2007) point out, scaling a firm's advertising and R&D expenditures by its sales rules out the alternative explanation that the effects documented are due to firm size. Advertising expenditures include the cost of advertising media (i.e., radio, television, and periodicals) and promotional expenses, while R&D expenditures include all costs incurred during the year that relate to the development of new products or services. The focus on advertising and R&D expenditures is consistent with the fact that they represent two of the four marketing mix levers (i.e., promotion and product) available to the CMO for shaping the marketing strategy. This choice is also corroborated by previous marketing literature that has focused on advertising and R&D activities when analyzing the impact of marketing on the

firm's value (e.g., Chaney et al., 1991; Grullon et al., 2004; Grullon et al., 2006; Joshi and Hanssens, 2004; Kelm et al.,1995; Mathur et al., 1997; Mathur and Mathur, 2000; McAlister et al., 2007; Pauwels et al., 2004; Sorescu et al., 2007; Srinivasan et al., 2009). Marketing activities like distribution and placement, even if they are part of the marketing mix, are not included in the measure of marketing intensity because of data availability, but the documented focus of the marketing literature on the variables included in the metric suggests that the first-order effects of the phenomenon under investigation should be captured by these variables.

The empirical analysis includes several control variables that have been commonly used in the literature as determinants of executive compensation.

CASH_CONS is the firm's cash constraints (Carter et al., 2007; Core and Guay, 1999; Dechow et al., 1996; Yermack, 1995), computed as the three-year average of [(Common and preferred dividends – cash flow from investing – cash flow from operations)/total assets]; VOLAT is the stock returns' volatility as a proxy for monitoring difficulty (Core and Guay, 1999), calculated as the standard deviation of monthly stock returns computed for the twelve preceding months; CAPEX is a proxy for investment opportunities (Smith and Watts, 1992), computed as the ratio between capital expenditures and annual sales; ROA is the firm's performance, calculated as operating income after depreciation divided by total assets (Murphy, 1985); SIZE is the natural log transformation of the firm's total assets (Himmelberg and Hubbard, 2000; Jin, 2002); and DIV_YLD is the firm's dividend yield, computed as the average dividend yield over the three-year period ending the year prior to the year of interest (Carter et al., 2007).

When using Tobin's q as the dependent variable, we also control for the annual growth in sales (GROWTH) and for the level of leverage (LEV), computed as long-term debt over the book value of equity. Leverage and growth are usually included in the analysis of determinants of shareholder value.

Finally, we control for industry effects by defining the three macro industries to which my observations belong: the manufacturing industry (MANUFACTURING), the trade industry (TRADE), and the service and finance (SER_FIN) industry. MANUFACTURING is a dummy variable set to one if the firm's two-digit SIC code is between 20 and 39, and zero otherwise; TRADE is a dummy variable set to one if the firm's two-digit SIC code is between 50 and 59, and zero otherwise; and SER_FIN is a dummy variable set to one if the firm's two-digit SIC code is between 60 and 89, and zero otherwise.

Sample description

The sample selection process led to a final sample of 227 firms and 586 firm-year observations over the period 2000-2009. Beginning with the 17,799 firm-year observations in Execucomp database for the period 2000-2009 for which it is possible to identify a CEO, we delete: 1,245 firm-year observations with no full data on CEO compensation, an additional 14,561 firm-year observations with missing data on CMO compensation, an additional 1,323 firm-year observations with missing advertising and/or R&D expenditures, and an addition 84 firm-year observations with missing data, resulting in a final sample of 586 firm-year observations representing 32 different two-digit SIC code industries. Tables 4.1 and 4.2. describe the final sample in terms of industry groups and years.

Table. 4.1. Sample distribution over time

Year	# obs.	%
2000	30	5.09
2001	45	7.64
2002	52	8.83
2003	62	10.53
2004	67	11.38
2005	69	11.71
2006	59	10.53
2007	72	12.22
2008	67	11.38
2009	63	10.7
Total	586	100.0

Table 4.2. Sample distribution across industries

Industry Group	**# obs.**	**%**
Manufacturing	287	49.0
Trade	163	27.8
Service and Finance	136	23.2
Total	586	100.0

Table 4.3 presents descriptive statistics for the final sample. In order to reduce the undue influence of outliers, variables are winsorized at the 1st and 99th percentiles. The descriptive analysis shows that the CMO is, on average, provided with fewer equity incentives than the CEO (median equity incentives of 0.077 and 0.206, respectively). This result is not unexpected since stock price is a particularly informative signal of the CEO's efforts and firms commonly use equity grants for compensating CEOs. The marketing intensity metric's median value of 0.083 indicates that, on average, firms invest in advertising and R&D at the rate of 8.3 percent of annual sales. Statistics on SIZE, ROA, and CASH_CONS show that the sample is made up of large and profitable firms with relatively low cash constraints, while Tobin's q values document that the sample firms' market value of assets average more than twice their replacement value, as proxied for by the book value of assets. All variables appear to be in reasonable ranges and to be comparable to those in similar studies.

Untabulated Pearson's correlation coefficients show that marketing intensity (MKTG_INTENSITY) is positively correlated with the CMO's equity incentives (CMO_INCENTIVE). The univariate analysis also shows that the CMO's equity incentives are positively related to shareholder value (TOBIN_Q). However, these results are inconclusive with respect to the paper's research questions because they fail to rule out the possibility that the CEO's equity incentives are the only determinant of the CMO's incentives and of shareholder value. This alternative explanation is supported by the high correlation between the CEO's and the CMO's incentives and between the CEO's incentives and shareholder value. The multivariate analysis will address this issue by documenting the incremental effects.

Table 4.3. Descriptive Statistics

	N	**Mean**	**SD**	**p25**	**Median**	**p75**
CEO_INCENTIVE	*586*	0.280	0.238	0.116	0.206	0.372
CMO_INCENTIVE	*586*	0.100	0.090	0.036	0.077	0.138
DIFF_OTH	*586*	0.009	0.080	-0.015	0.006	0.036
MKTG_INTENSITY	*586*	0.116	0.116	0.031	0.083	0.171
CASH_CONS	*586*	-0.015	0.093	-0.067	-0.019	0.026
VOLAT	*586*	0.141	0.079	0.084	0.121	0.167
CAPEX	*586*	0.056	0.058	0.023	0.038	0.069
ROA	*586*	0.075	0.112	0.031	0.085	0.137
SIZE	*586*	6.826	1.473	5.827	6.704	7.584

DIV_YLD	*586*	0.005	0.011	0.000	0.000	0.006
TOBIN_Q	*586*	2.192	1.208	1.319	1.840	2.690
LEV	*586*	0.319	0.881	0.000	0.050	0.498
GROWTH	*586*	0.098	0.229	-0.018	0.075	0.185

A regression approach

To investigate the first research question, we propose the following OLS model with year fixed effects and robust standard errors clustered at the firm level:

$$CMO\_INCENTIVE = \alpha_0 + \alpha_1 * MKTG\_INTENSITY + \alpha_2 * CEO\_INCENTIVE + \alpha_3 * CASH\_CONS + \alpha_4 * VOLAT + \alpha_5 * CAPEX + \alpha_6 * ROA + \alpha_7 * SIZE + \alpha_8 * DIV\_YLD + \alpha_9 * TRADE + \alpha_{10} * MANUFACTURING + \varepsilon \quad (1)$$

An important concern that arises when estimating model (1) by OLS relates to the presence of sample selection bias. Many firm-year observations are lost because of missing data on the CMO's compensation. In fact, the CMO must be one of the highest paid executives for his or her compensation to be available. It could be that the CMO in a given firm never enters this group of executives because his or her remuneration is not high enough or it might happen that the CMO is among the highest paid executives one year and not the next. This possibility increases the probability that the final sample has a selection bias. If the final sample is not representative of the whole population, results cannot be generalized and the analysis would lack external validity.In order to correct for the potential presence of sample selection bias, we estimate all models using Heckman's (1979) two-step method. The Heckman analysis can adjust for sample selection bias based only on observable characteristics and cannot control for bias coming from unobservable characteristics that are not included in the selection equation. Since no model for detecting the selection equation is present in the literature, we propose the following parsimonious equation for modeling the probability of an observation's being included in the final sample:

$$SELECTION = \delta_0 + \delta_1 * NUM\_EXEi + \delta_2 * MKTG\_INTENSITY + \delta_3 * ROA + \delta_4 * SIZE + \delta_5 * TRADE + \delta_6 * MANUFACTURING + \eta \quad (S)$$

SELECTION is an indicator variable that takes the value of 1 if the observation is included in the final sample and zero otherwise, and NUM_EXE is the number of executives for whom the company discloses compensation data. The other variables have already been defined. Data are retrieved from Execucomp and

Compustat database. All available observations on Execucomp database over the period 2000-2009 with data for estimating (S) are used to implement the Heckman model. The overall sample for implementing Heckman's procedure is made up of 4,085 firm-year observations. Table 4.5 presents results of a firm-cluster adjusted probit model for (S). The model appears to be well-specified, with most variables statistically significant. The test of overall model significance strongly rejects the null hypothesis that all coefficients are jointly equal to zero (Prob > chi2 = 0.0002).

Table 4.5. A selection model

SELECTION	Coef. [Std. Err.]
NUM_EXE	0.064**
	[0.027]
MKTG_INTENSITY	1.042***
	[0.399]
ROA	0.051
	[0.353]
SIZE	-0.098***
	[0.027]
TRADE	0.234*
	[0.133]
MANUFACTURING	0.087
	[0.110]
Constant	-0.960***
	[0.265]
YEAR DUMMIES	YES
N = 4,085	
Pseudo R2 = 0.0240	
Prob > chi2 = 0.0002	

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Table 4.5 shows that, as expected, higher marketing intensity increases the probability that the observation is included in the analysis. Table 4.5 also shows that the CMO's compensation is more likely to be available when companies disclose compensation data for a larger number of executives than when they disclose data for a smaller number of executives. While firm performance does not influence the selection probability, firm size has a negative relationship to the selection variable. Finally, the coefficient on TRADE is positive and significant, suggesting that firms in the trade industry are more likely to disclose data on CMO compensation than is the finance and service industry (the control group). Table 4.6 presents results from model (1), estimated by using Heckman two-stage method.

Table 4.6 Heckman two-stage model

	[1]	[2]
CMO_INCENTIVE	Coef. [Std. Err.]	Coef. [Std. Err.]
MKTG_INTENSITY	0.240***	0.233***
	[0.073]	[0.067]
CEO_INCENTIVE		0.058**
		[0.024]
CASH_CONS	0.008	0.026
	[0.026]	[0.031]
VOLAT	-0.049*	-0.056*
	[0.027]	[0.033]
CAPEX	0.047	0.028
	[0.040]	[0.059]
ROA	0.078	0.084
	[0.066]	[0.059]
SIZE	-0.008	-0.006
	[0.005]	[0.005]
DIV_YLD	-0.594***	-0.767***
	[0.194]	[0.215]

INVERSE MILLS RATIO	0.172***	0.156***
	[0.014]	[0.014]
TRADE	0.025	0.240*
	[0.025]	[0.130]
MANUFACTURING	0.006	0.091
	[0.020]	[0.104]
Constant	-0.191***	-1.006***
	[0.048]	[0.231]
YEAR DUMMIES	YES	YES
N	586	586
R^2	0.219	0.335

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

The positive and significant coefficient on marketing intensity (MKTG_INTENSITY) indicates that, when companies invest more in marketing (i.e., advertising and R&D), the CMO is provided with more equity incentives, giving support to our research hypothesis. That the Inverse Mills ratio is highly significant suggests that the Heckman's correction for sample selection bias is necessary and that OLS coefficients would otherwise be biased.

The coefficient on the CEO's equity incentives is positive and significant, indicating that the CMO's and the CEO's equity incentives move in the same direction. Nonetheless, because the coefficient on marketing intensity is still significant after controlling for the CEO's equity incentives, the CEO's incentives are not the only determinant of the incentives the CMO gets. Coefficients from column 2 in Table 4.6 indicate that, ceteris paribus, moving from the first to the second quartile of the marketing intensity variable, mean (median) CMO equity incentives increase by 12 percent (16%), showing that the results documented are both statistically and economically significant.

The next part of the analysis determines whether marketing intensity is a driver of equity incentives that is unique to the CMO or whether it also drives the equity incentives of the other non-CEO executives. For this purpose we use the variable, previously defined, DIFF_OTH that computes the difference in equity incentives between the CMO and the other non-CEO executives. Negative values of DIFF_OTH indicate that the CMO's equity incentives are higher than those of other non-CEO executives. Therefore, if marketing intensity only drives the CMO's incentives or drives CMO's incentives to a larger extent

than other executives' incentives, a negative coefficient on MKTG_INTENSITY should result when using DIFF_OTH as the dependent variable.

Table 4.7. A comparison within the top management team

DIFF_OTH	Coef. [Std. Err.]	Coef. [Std. Err.]
MKTG_INTENSITY	-0.150**	-0.150***
	[0.060]	[0.058]
CEO_INCENTIVE		0.002
		[0.024]
CASH_CONS	-0.007	-0.007
	[0.034]	[0.035]
VOLAT	-0.039	-0.040
	[0.038]	[0.038]
CAPEX	-0.039	-0.040
	[0.058]	[0.063]
ROA	0.024	0.023
	[0.047]	[0.049]
SIZE	0.016***	0.016***
	[0.005]	[0.005]
DIV_YLD	-0.333	-0.332
	[0.279]	[0.274]
INVERSE MILLS RATIO	-0.098***	-0.098***
	[0.030]	[0.029]
TRADE	-0.045**	-0.045*
	[0.022]	[0.023]
MANUFACTURING	-0.013	-0.012
	[0.015]	[0.014]
Constant	0.109**	0.109**
	[0.055]	[0.054]
YEAR DUMMIES	YES	YES

N	586	586
R^2	0.045	0.051

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

The results shown in Table 4.7 from model (1) estimated using DIFF_OTH as the dependent variable corroborate the support for our hypothesis, suggesting that the company's marketing intensity explains not only the CMO's equity incentives but also the difference between the CMO's incentives and those of the other non-CEO executives. Specifically, Table 4.7 indicates that when marketing intensity increases, companies increase the level of CMO's equity incentives but do not adjust the incentives of the other non-CEO executives proportionately.

Our research design assumes that a firm's marketing intensity is exogenous with respect to the CMO's equity incentives—that is, that a CMO can decide how to invest the marketing budget (e.g., long-term-oriented marketing campaigns vs. short-term promotion activities) based on his or her incentive scheme, but cannot decide to spend more on marketing, thereby changing company's marketing intensity ratio. Therefore, in our research design the firm's marketing intensity is determined by the firm's corporate strategy and other industry-related characteristics while the choice of how to allocate marketing resources varies according to the CMO's equity incentives. Given the importance of this assumption for the results, the robustness check session uses an instrumental variable approach to check for possible endogeneity problems.

In investigating our research hypothesis, which deals with the impact of the CMO's equity incentives on shareholder value, we fit the following firm cluster-adjusted regression models with sample selection and year fixed effects:

$$\text{TOBIN\_Q} = \gamma_0 + \gamma_1 * \text{CMO\_INCENTIVE} + \gamma_2 * \text{CEO\_INCENTIVE} + \gamma_3 * \text{MKTG\_INTENSITY} + \gamma_4 * \text{VOLAT} + \gamma_5 * \text{CAPEX} + \gamma_6 * \text{ROA} + \gamma_7 * \text{SIZE} + \gamma_8 * \text{GROWTH} + \gamma_9 * \text{LEV} + \gamma_{10} * \text{TRADE} + \gamma_{11} * \text{MANUFACTURING} + \theta \quad (2)$$

Table 4.8 shows results from estimating model (2). The coefficient on CMO_INCENTIVE documents a positive and significant relationship between the CMO's equity incentives and shareholder value, suggesting that, when a firm provides the CMO with higher levels of equity incentives, the firm's value significantly increases. Column 2 of Table 4.8 indicates that the positive effect of the CMO's incentives on shareholder value is incremental to that of the CEO, thus providing support for our research hypothesis. In particular, estimate results indicate that, ceteris paribus, moving from the first to the second quartile of CMOs' equity incentives increases the mean (median) Tobin's q by 7

percent (8%). As a consequence, the CMO's equity incentives are far from being a second-order effect.

Finally, the last part of the chapter examines whether the positive impact on the firm value of the CMO's equity incentives exists only in those firms that invest in marketing more than the industry average or whether the documented results hold for all firms. In order to shed light on this issue, the sample is divided between companies that invest in marketing more than the industry average and those that invest less, with a dummy variable (HIGH) taking the value of one (zero) if the firm's marketing intensity is above (below) the median marketing intensity of the industry, computed separately each year. After interacting CMO_INCENTIVE with this dummy, we fit the following model with sample selection, firm-clustered standard errors, and year fixed effects:

$$TOBIN\_Q = \pi_0 + \pi_1 * CMO\_INCENTIVE + \pi_2 * CMO\_INCENTIVE * HIGH + \pi_3 * CEO\_INCENTIVE + \pi_4 * HIGH + \pi_5 * VOLAT + \pi_6 * CAPEX + \pi_7 * ROA + \pi_8 * SIZE + \pi_9 * GROWTH + \pi_{10} * LEV + \pi_{11} * TRADE + \pi_{12} * MANUFACTURING + \theta \quad (3)$$

Table 4.9 shows results from model (3). Coefficients reported indicate that the CMO's equity incentives are positively associated with shareholder value both in low marketing intensity firms ($\pi 1>0$) and in high marketing intensity firms ($\pi 1+\pi 2>0$). The interaction term ($\pi 2$) is not statistically different from zero, so the positive effect of the CMO's incentives on firm value does not differ based on whether the company invests in marketing more or less than average in the same industry. This result, which suggests a strategic role of the CMO that goes well beyond simply managing marketing investments, is consistent with Anderson's (1982) seminal work, which indicates a core role of marketing in the process of strategy formulation, in setting clear objectives, and in supporting a long-run orientation in the decision-making process. Srivastava et al. (1998) also highlight a strategic role of marketing (and, consequently, of the CMO) that is not merely linked to the level of advertising and R&D expenditure. Finally, whether the marketing expenditure is above or below the industry median, the CMO may decide to engage in marketing activities that affect firm value either in the long term or in the short term. All of these observations are consistent with the CMO's equity incentives having a positive relationship with shareholder value in both high-marketing intensity and low- marketing intensity firms.

Table 4.8. Tobin's q and non-CEO incentives

TOBIN_Q	Coef. [Std. Err.]	Coef. [Std. Err.]
CMO_INCENTIVE	5.045***	3.796***
	[1.107]	[0.939]
CEO_INCENTIVE		1.222***
		[0.312]
MKTG_INTENSITY	0.677	0.709
	[0.674]	[0.662]
VOLAT	1.595*	1.456*
	[0.834]	[0.759]
CAPEX	0.879	0.440
	[0.974]	[0.979]
ROA	4.256***	3.832***
	[0.877]	[0.898]
SIZE	-0.220***	-0.239***
	[0.041]	[0.042]
GROWTH	0.372	0.326
	[0.232]	[0.213]
LEV	-0.041	-0.016
	[0.050]	[0.048]
INVERSE MILLS RATIO	-0.192***	-0.199***
	[0.074]	[0.068]
TRADE	-0.475***	-0.340*
	[0.178]	[0.180]
MANUFACTURING	-0.330**	-0.253*
	[0.152]	[0.150]
Constant	2.758***	2.710***
	[0.403]	[0.385]

YEAR DUMMIES	YES	YES
N	586	586
R^2	0.413	0.452

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Therefore, while results from the first part of this chapter show that companies tend to incent the CMO only when they invest more in marketing, results in this last set of analyses suggest that the positive effect on the value of the CMO's incentives is not limited to those firms with high marketing intensity. A possible alternative explanation is related to the fact that CMOs in high marketing intensity firms are nearer to the optimal level of incentives since they are provided with higher levels of equity incentives. Therefore, the potentially higher benefit of providing better incentives to the CMO in firms with high marketing intensity could be offset if CMOs in these companies already receive higher levels of equity incentives and are close to the optimal level of incentives.

Table 4.9. Cross-sectional analyses

	Coef. [Std. Err.]	Coef. [Std. Err.]
TOBIN_Q		
CMO_INCENTIVE	5.367***	4.067***
	[0.847]	[0.843]
CMO_INCENTIVE*HIGH	-0.251	-0.137
	[1.563]	[1.415]
CEO_INCENTIVE		1.210***
		[0.308]
HIGH	0.195	0.173
	[0.160]	[0.148]
VOLAT	1.552*	1.402*
	[0.846]	[0.775]
CAPEX	1.090	0.683
	[0.872]	[0.891]

ROA	4.068***	3.626***
	[0.865]	[0.880]
SIZE	-0.209***	-0.228***
	[0.041]	[0.043]
GROWTH	0.380	0.334
	[0.239]	[0.218]
LEV	-0.041	-0.017
	[0.049]	[0.047]
INVERSE MILLS RATIO	-0.220**	-0.232***
	[0.098]	[0.090]
TRADE	-0.686***	-0.562***
	[0.171]	[0.172]
MANUFACTURING	-0.422***	-0.350**
	[0.153]	[0.152]
Constant	2.921***	2.918***
	[0.439]	[0.418]
YEAR DUMMIES	YES	YES
Ha: (CMO_INCENTIVE + CMO_ INCENTIVE*HIGH) > 0	p-value:	p-value:
	0.0003	0.0007
N	586	586
R^2	0.412	0.450

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Additional analyses

This section describes several robustness checks performed to ensure that the results documented are not driven by choices made in the research design.

First, in order to ensure that the measure of marketing intensity used in the analyses is not driven primarily by differences in firm size, we scaled advertising and R&D expenditures by annual sales. Another approach is to scale marketing investments by total assets (McAlister et al., 2007). As Cheng and Chen (1997) point out, the choice of the scalar variable is not a trivial issue since it may change the results as well as their interpretation. Untabulated results show that

using total assets as scalar leads to qualitatively similar results.

We also tried to disentangle the marketing intensity metric into its two components, advertising and R&D expenditures, in order to determine whether results are just driven by both or only one of them. Untabulated results obtained by estimating model (1) using the two metrics separately indicate that both are positively related to the CMO's equity incentives and negatively related to the difference in incentives between other non-CEO executives and the CMO.

Second, it could be argued that there is a mechanical relationship between the CMO's equity incentives in year t and the Tobin's q computed at the end of the same fiscal year. In fact, analyzing how the CMO's incentives and Tobin's q are computed shows that both metrics include in their computations the company's fiscal year-end stock price. In order to address this issue, we augment equation (2) and (3) by including as an additional regressor the company's fiscal year-end stock price. If the potential mechanical relationship exists, this augmented model would control for it. Untabulated results show that, as expected, fiscal year-end stock price positively and significantly loads on Tobin's q, but all of the coefficients of interest maintain their sign, magnitude, and statistical significance.

Third, we used an instrumental variable approach to test for potential endogeneity between the CMO's incentives and the firm's marketing intensity. As an instrument for the firm's marketing intensity, we use the marketing intensity of the industry to which the company belongs, excluding the company itself. The firm's marketing intensity is likely to be highly correlated with the industry's marketing intensity, while the marketing intensity of the whole industry is not influenced by the incentives of the firm's CMO. Supporting the choice of the industry's marketing intensity as a valid instrument, in the final sample the firm's and the industry's marketing intensity are correlated at 60 percent. Untabulated results from an IV approach confirm those presented.

Finally, we estimate models (2) and (3) using two different specifications of shareholder value. In a first robustness check we used as a proxy for shareholder value the change in Tobin's q with respect to the previous year and, in a second analysis, the Tobin's q computed at time (t+1) instead of at time (t). Untabulated results yield to results that are qualitatively similar to those reported in the main analysis, and all conclusions are unchanged.

Concluding remarks

Using a sample of 586 firm-year observations over the period 2000-2009, this research sheds light on the economic determinants and effects on shareholder value of the CMO's equity incentives. Specifically, we find that firms with more

marketing intensity give their CMOs more equity incentives and that CMOs' incentives are positively related to shareholder value. These findings have important implications for both theory and practice.

First, results documented in the paper challenge the mainstream view that the CEO's compensation captures all first-order effects and that the consequences of the compensation structure of executives other than the CEO are negligible. By focusing on a non-CEO executive who manages processes and activities that extant literature has documented are particularly important in creating shareholder value, this study documents that non-CEO executives play an important role in delivering shareholder value when they are properly incented. Moreover, the analysis shows that companies do not simply rescale CEOs' incentives when deciding how to incent other top executives but take a proactive role in detecting other economic determinants in order to set the appropriate level of incentives. These results are likely to open a wide research stream that analyzes the economic determinants of other non-CEO executives' incentives and their effects on firm value. This analysis also complements the literature stream that investigates the relationship between marketing and firm performance by providing insights on the economic determinants and effects on value of CMO's incentives.

Findings reported in this chapter warn companies not to focus only on setting the CEO's incentives while neglecting to incent other top executives properly. In particular, results suggest that companies should try to incent the CMO independently based on his or her marketing budget because the CMO can boost shareholder value on a way that is incremental to how the CEO does so. As a consequence, if the board of directors decides not to provide the CMO with sufficient equity incentives, it is likely that this decision will be suboptimal for shareholders. This aspect of the chapter's findings is particularly important because academic research, by focusing on the CEO, could convey to practitioners the wrong message: that all firm efforts should be devoted to properly incenting only the CEO.

Chapter 5
Executive Compensation and Misbehavior

This chapter tackles the question of the role of executive compensation in promoting misbehaviors. Focusing on earnings management strategies, the chapter shows that executives' decisions on how to play the earnings game is not neutral with respect to the structure of their incentives.

Misbehavior, earnings management, number game, real earnings management

Incentives, misbehavior, and the earnings game

Rationalization, the incentive to commit fraud, and the opportunity to do it are the elements of the so-called "fraud triangle" developed by Cressey (1973). This three-pronged framework suggests that fraud is more likely to occur when there is an incentive to commit the fraud, when weak controls or oversight provide an individual or organization with the opportunity to commit the fraud, and when the perpetrator can rationalize the fraudulent behavior. In the early 1980s, the fraud triangle concept was adapted from criminology for use in accounting (Choo and Tan, 2007), and it proved to be a useful tool for CPAs who seek to understand and manage fraud risk. The "fraud triangle" framework has also been formally adopted by the auditing profession as part of the Statement of Auditing Standards No. 99, which addresses the consideration of fraud in a financial statement audit (Wolfe and Hermanson, 2004).

From this perspective, the structure of executive compensation has been long considered one of the potential causes of manager misbehaviors because it often provides managers with the incentives to commit the fraud. When discussing about executive misbehaviors, the literature has typically focused on

earnings management practices. Different definitions of earnings management practices exist in the literature but, broadly speaking, earnings management is considered the intentional behavior put in place by top executives to inflate or deflate accounting earnings in order to mislead external stakeholders about the economic performance of the company. Moreover, executives can also manage firm's real operations and manipulate guidance provided to analysts in order to mislead external stakeholders. More precisely, accounting and finance literature has argued that executives can play the earnings game using three not mutually exclusive strategies:

- Real earnings management. Managers by engaging in real earnings manipulations make the firm to departure from its normal operational practices in order to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations (Roychowdhury, 2006, p. 337).
- Accrual-based earnings management. Executives can use the managerial discretion left by accounting principles to shift income overtime (Degeorge et al., 1999);
- Analysts' expectation guidance. Managers can avoid negative earnings surprises by guiding analysts' forecasts downward (Bartov et al., 2002; Matsumoto, 2002);

Importantly, previous literature points out that these strategies are used simultaneously and there are trade-offs among them. In this line, prior research analyzed how institutional changes and firm specific incentives influence the trade-off among earnings management strategies. Cohen et al. (2008) show that the passage of the Sarbanes-Oxley Act (SOX) triggered a shift from accrual to real earnings management, while Bartov and Cohen (2009) point out that in the post-SOX period, with respect to pre-SOX era, there is a decline in both accrual earnings management and downward earnings expectation management but an increase in real earnings management. These findings are consistent with the intuition that the SOX imposed high costs on accrual manipulation and constrained analysts' guidance, thus inducing executives to shift to real earnings management that is more difficult to be detected. Zang (2012) focuses on accrual and real earnings management and investigates several firm's related characteristics that influence the relative costliness of these two earnings game strategies. Results in Zang (2012) indicate that real activity manipulation is constrained by firms' competitive status in the industry, financial health, scrutiny from institutional investors and tax consequences of manipulation.

In a similar vein, Matsumoto (2002) analyzes the trade-off between accrual-based earnings management and analysts' expectation guidance and suggests that firm characteristics play a role in how companies meet analysts' expectations. Overall, these contributions suggest that executives trade off earnings game strategies considering the relative costs and benefits.

A related research stream investigated the relationship between CEO's incentives and firm's decisions to manipulate earnings. For instance, Bauman and Shaw (2006) and Cheng and Warfield (2005) document a positive relationship between equity-based compensation and the probability that the firm meets analysts' targets. Bergstresser and Philippon (2006) show that the use of discretionary accruals to manipulate reported earnings is more pronounced in firms where CEO's total compensation is more closely tied to the value of stocks. In the same vein, Grant et al. (2009) find that CEOs risk-taking incentives are positively related to income smoothing. Pourciau (1993), instead, focuses on CEO's turnover and shows that incoming executives manage accruals in a way that decreases earnings in the year of the executive change and increases earnings the following year. Moreover, results in Pourciau (1993) indicate that departing executives record accruals and write-offs that decrease earnings during their last year of tenure. Consistently with these findings, Wells (2002) reports results supporting the notion that new CEOs engage in an earnings bath. Overall, findings from this strand of literature suggest that CEO's personal incentives, both monetary and non-monetary, play a core role in firms' decision of whether playing the numbers game.

Despite the several mentioned contributions that analyze the relationship between CEO's incentives and earnings management, there is a lack of evidence about how CEO's incentives shape the trade-off among the different earnings game strategies. This lack of evidence is particularly important because earnings game strategies are decided and executed by the CEO of the company who, most likely, is going to consider in the choice among the different options also her personal costs and benefits.

Bauman et al. (2005) partially fill this gap providing evidence that, in the pre-SOX era, stock option compensation affects positively earnings guidance and negatively accrual-based earnings management, but it is still unclear the role of CEO's incentives in the post-SOX era on earnings game strategies. Similarly, Demers and Wang (2010) analyze the impact of CEO's age on accrual and real earnings management but their study does not model a trade-off among earnings game strategies. Moreover, previous research suffers a major limitation: the different numbers game strategies are considered one by one and there

is not an attempt to analyze the trade-off among them as a result of CEOs incentives.

Costs and benefits of earnings management strategies

Understanding how incentives shape the trade-off among earnings management strategies is important because the different strategies come with different costs for the firm. Specifically, among all earnings game strategies available to executives to meet/beat targets, real earnings management is, by far, the most costly option for the firm. In fact, real earnings management modifies firm's operations making them to divert from their normal course without an underlying economic reason. Evidence reported in Graham et al. (2005), indicate that when executives engage in real earnings management they burn real cash flows and forgo projects with positive net present value. Specifically, results from Graham et al. (2005)'s survey indicate that only the 50% of managers interviewed would take a project that increases shareholder value if this would mean to miss consensus earnings. Moreover, the 80% of survey participants reported that they would decrease discretionary spending on R&D, advertising, and maintenance to meet an earnings target, and more than half stated that they would delay starting a new project to meet a benchmark. As a consequence, the primary side effect of real earnings management practices is to impair the value of the firm and its ability to compete and create shareholder value in the next future, because of current suboptimal investment choices. A second side effect of real earnings management consists in decreasing discretionary investments which are risky and volatile by nature and that could enhance stock price volatility in the future. Specifically, real manipulations reduce firms' possibility to bet on risky investment policies, such as investing in R&D projects. Therefore, real manipulations could potentially decrease firm's future stock price volatility.

Even if accrual-based earnings management, contrary to real earnings management, does not have any cash flow effects and does not modify firm's operations, it imposes anyway risks and costs on the firm, especially after the passage of the SOX in 2002. In fact, after the SOX, accrual manipulations are more likely to draw auditors' and regulators' scrutiny with the subsequent risk of incurring into formal sanctions, adverse publicity and legal costs in the case of questionable financial reporting. Academic research and the popular press argued that it became particularly costly for firms to engage in accrual-based earnings management activities in the Post-SOX period because of increased regulatory and auditing scrutiny, and because of the more stringent enforcement for securities regulation violations (Cohen et al., 2008; Bartov and Cohen, 2009). The increase in fines and regulatory scrutiny implies that the expected

penalty for aggressive financial reporting has become greater (Lobo and Zhou, 2006). Therefore, the primary side effect of accrual-based earnings management is to impose potential costs and risks on the firm, even if these costs are likely to be less detrimental for firm's future value than those imposed by real earnings management because they do not affect firm's operations.

Finally, analysts' guidance does not encompass a manipulation of reported earnings but acts on analysts' expectations about firm's future earnings. Therefore, this earnings game strategy neither interfere with firm's business operations, nor alter accounting numbers reported to external investors. Thus, analysts' guidance strategies leave untouched both firm's operations and financial statements. Nonetheless, when executives guide analysts provide them with additional information about firm's future prospects, and in doing so they contribute to decrease asymmetry information in the market among investors and analysts. As a consequence, this earnings game strategy does not threaten firm's value but might decrease stock price volatility.

Empirical evidence on the role of executive compensation on earnings management strategies

To shed light on the role of executives' incentives in shaping the trade-off among earning game strategies, we used a sample of 1088 U.S. firms over the period 2003-2010 and model the choice of which earnings game strategy to use as a function of the intensity of CEO's incentives. Consistently with the analysis carried out in Chapter 3, we focus on equity incentives and risk incentives. CEO's equity incentives are measured using the incentive ratio computed as in Bergstresser and Philippon (2006, 519-520), while CEO's risk incentives are proxied by the Vega of CEO's stock options divided by their Delta, similar to the methodology used in Rogers (2002, 2005) and Grant et al. (2009), namely. This is consistent with Core et al. (2003), claiming that risk taking is a second-order effect in option compensation since the incentives to increase stock price dominates the incentive to take risk. We therefore examine the role on earnings game strategies of this second-order effect with respect to the first-order one. We compute CEO's option Vega as the sensitivity of CEO's option holding to a unit change in stock price volatility by using the first derivative of the Black-Scholes option-pricing model in relation to firm's volatility. The Delta is instead computed taking the partial derivative of the Black-Scholes equation with respect to stock price.

When investigating the association between CEO's incentives and earnings game strategies, we control for several potentially confounding variables:

- Log Assets, which is the natural logarithm of total assets and proxies for firm's size;
- Cycle, which is the length of the operating cycle computed as in Dechow (1994) and it is an underlying determinant of the variability of working capital;
- M_B, which is the market value of equity divided by the book value of equity, and it proxies for growth opportunities;
- Z Score, which is Altman's Z-score (Altman, 2000) which proxies for a firm's financial health;
- Market Share, which is firm's market share computed as the ratio of a company's total sales to the total sales of its three-digit SIC code industry in a given year-quarter;
- NOA, which is firm's net operating assets (i.e. shareholders' equity less cash and marketable securities plus total debt) standardized by total assets;
- BIG 4, which is an indicator variables that takes the value of 1 if firm's auditor is a Big 4, zero otherwise;
- Tenure Auditor, which is the number of years the auditor has audited the firm;
- ROA, which is operating profits divided by total assets;
- Tenure CEO, which is a dummy variable that takes on value of 1 if CEO's tenure is greater or equal to 3, and zero otherwise. This is consistent with Fredrickson et al. (1988) that argue that early vulnerability occurs when CEO tenure is less than, or equal to, three years, while after three years CEOs start gaining power and becoming more entrenched.
- Age, as a proxy for the CEO's career concerns.

A key aspect relates on how to measure the trade-off among the different earnings game strategies To do so, we create four metrics that directly analyze the trade-off among earnings game strategies. Specifically, we first build proxies for the three strategies building on prior literature (Cohen and Zarowin, 2010, Kothari et al., 2005; Roychowdhury, 2006; Bartov and Cohen, 2009; Cohen et al., 2008; Cohen and Zarowin, 2010; Zang 2012; Matsumoto, 2002) and then we sort the three earnings management proxies (Accrual EM, Real EM, and Guidance EM) into deciles, and create ratios that compute the relative use of a given earnings game strategy with respect to the other alternatives. Using this approach, we model executives' decision to engage in a given earnings game strategy as a function of her equity and risk incentives.

Table 5.1 presents results on the association between CEO's incentives and the decision to engage in real earnings management activities compared to the other EM activities (i.e. accrual and guidance).

Table 5.1. Equity incentives, Risk incentives and Earnings game strategies

	Real_vs_All
Equity Incentives	-1.145***
	[-4.746]
Risk Incentives	-0.046
	[-0.366]
Age	-0.002***
	[-3.753]
Log Assets	0.059***
	[5.331]
Cycle	-0.000***
	[-6.173]
M_B	0.009***
	[2.614]
Z Score	0.011***
	[3.939]
Market Share	0.123***
	[3.968]
NOA	-0.043
	[-1.046]
Big 4	-0.042**
	[-2.546]
Tenure Auditor	-0.001*
	[-1.958]
ROA	-0.075
	[-0.219]

Tenure CEO		0.149***
		[4.045]
Year Dummies		YES
Quarter Dummies		YES
Industry Dummies		YES
Observations		4,471

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

The negative and statistically significant coefficients on CEO's equity incentives suggest that CEOs with high equity incentives tend to substitute real earnings management with other alternatives. It is important to note that the variable Real_vs_All does not capture the total amount of earnings management, but it proxies for the relative use of real earnings management with respect to overall earnings management activity. The insignificant coefficient on CEO's risk incentives indicates that CEO's risk incentives do not make executives less likely to resort to real earnings management. These results are consistent with the idea that real earnings management are perceived by executives as being value destroying in the long term.

In order to directly investigate the order of preference among the three earnings game strategies, we estimate a model using as dependent variables the different combinations of earnings management strategies: Real_vs_Guidance, Accrual_vs_Guidance, and Real_vs_Accrual. In fact, these variables compare earnings game strategies two by two, and allow us to shed lights on their trade-off.

Table 5.2. Disentangling earnings game strategies

		Real_vs_Guidance		Accrual_vs_Guidance		Real_vs_Accrual
Equity Incentives		-13.794***		-11.112***		-20.271***
		[-4.494]		[-3.743]		[-7.238]
Risk Incentives		-1.700		3.225**		-1.070
		[-1.065]		[2.081]		[-0.734]
Age		-0.020***		-0.028***		-0.023***
		[-2.586]		[-3.756]		[-3.177]

Log Assets	0.738***	0.351***	1.029***
	[5.197]	[2.586]	[7.883]
Cycle	-0.003***	-0.002**	-0.005***
	[-3.515]	[-2.449]	[-5.324]
M_B	0.122***	0.143***	0.237***
	[2.760]	[3.347]	[5.875]
Z Score	0.122***	0.114***	0.213***
	[3.324]	[3.188]	[6.350]
Market Share	2.183***	0.845**	0.737**
	[5.470]	[2.210]	[1.960]
NOA	-0.541	-1.056**	-2.328***
	[-1.046]	[-2.100]	[-4.905]
Big 4	-0.307	-0.527***	-0.647***
	[-1.457]	[-2.592]	[-3.321]
Tenure Auditor	-0.009	-0.015**	-0.019***
	[-1.193]	[-2.137]	[-2.894]
ROA	-0.094	14.227***	-5.565
	[-0.021]	[3.352]	[-1.384]
Tenure CEO	1.715***	1.674***	2.622***
	[3.653]	[3.668]	[6.134]
Year Dummies	YES	YES	YES
Quarter Dummies	YES	YES	YES
Industry Dummies	YES	YES	YES
Observations	4,471	4,471	4,471

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Table 5.2 reports coefficients on CEO's equity incentives that are negative and statistically significant across the three earnings management metrics analyzed. Specifically, results indicate that CEOs with high equity incentives prefer

to guide analysts' expectations (column 1) or engage in accrual-based earnings management (column 3) rather than manipulating firm's business operations. The negative coefficient on CEO's equity incentives in column 2 also confirms that CEOs with high equity incentives prefer to guide analysts rather than managing accruals.

As regards CEO's risk incentives, the positive and significant coefficient in column 2 confirms that CEOs with high risk-incentives prefer to manage accruals instead of guiding analysts' expectations, while the statistically insignificant coefficient in column 3 does not support the conjecture that risk-incentives, stemming from stock option holding, prevent CEOs from managing real operations. This result can be due to the fact that risk-related incentives might only prevent cutting certain types of discretionary investments (e.g. long-term R&D) while they do not have any effects on cutting other expenditures (e.g. employee training) that determine real earnings management metrics.

As expected, coefficients on CEO's age mirror those of CEO's equity incentives Specifically, results suggest that CEOs with high career concerns prefer i) to guide analysts as first choice, ii) to manage accruals as second option, and iii) to manipulate real activities as last available alternative.

Implications for future performance

The previous analyses suggest that CEOs with high equity incentives consider real earnings management the most costly earning game strategy and try to avoid it. Our research framework assumes that this result is due to the fact that real earnings management, contrary to accrual-based earnings management and analysts' expectation guidance, modifies firm's operations and thus decreases firm's future shareholder value. Executives whose interests are more aligned with those of shareholders, in terms of equity incentives and career concerns, incorporate this cost to a larger extent than CEOs with low incentives, and use less real manipulations to meet/beat benchmarks.

In this section of the chapter, we empirically test this underlying assumption, by analyzing if firms engaging in real manipulations have lower future performances with respect to companies that adopt other earnings game strategies. Specifically, we analyze the economic consequences of using real earnings management rather than accrual earnings management or analysts' guidance by focusing on future market performance, which is a direct measure of shareholder value.

In our empirical analysis we consider the presence of potential endogeneity both between CEO's compensation and earnings game strategies, as well as

between earnings game strategies and firm's market performance. In fact, executives are likely to decide current earnings game strategies considering firm's future performance prospects, thus raising potential endogeneity problems. Specifically, we model firm's future market performance as follows:

Future market performance = f(earnings management strategies, control variables) (D)

and to control for endogeneity we add the following equations to (D):

Earnings management strategies = f(equity incentives, risk incentives, control variables) (A)
Equity incentives = f(industry equity incentives, control variables) (B)
Risk incentives = f(industry risk incentives, control variables) (C)

Table 5.3. reports results for equation (D) obtained by estimating the simultaneous equation system made by equations (D), (A), (B) and (C) through 3SLS. In order to investigate the effect of using real earnings management rather than accrual-based earnings management or analysts' expectation guidance, we use as independent variable in (D) the variable Real_vs_All used in Table 5.1. Instead, for analyzing the persistence of effects documented we use as dependent variable in (D) firm's market returns cumulated one quarter ahead (Returns Q+1), two quarters ahead (Returns Q+2), three quarters ahead (Returns Q+3), and four quarters ahead (Returns Q+4).

The negative and statistically significant coefficients on Real_vs_All, throughout Table 5.3, provide support for our conjecture that real manipulation is the most costly earnings game strategy for shareholders, since it is systematically negatively associated with future market performance. This is consistent with findings reported in Graham et al. (2005), showing that when executives engage in real activity manipulations they are willing to take economic actions that could have negative long-term consequences and that sacrifice long-term value. Interestingly, the magnitude of the coefficients on Real_vs_All indicates that the negative impact of real manipulations follow a parabolic pattern, thus suggesting that the effects of real manipulations are persistent overtime but they are particularly strong after one quarter.

Results presented, therefore, suggest that equity are effective in aligning CEOs' behavior and shareholders' interests, since they prevent CEOs from managing firm's operations with the subsequent documented negative effects on shareholder value.

Table 5.3. Real earnings management and future performance

	Returns (Q+1)	Returns (Q+2)	Returns (Q+3)	Returns (Q+4)
	(1)	(2)	(3)	(4)

Real_vs_All	-0.351***	-0.561***	-0.543***	-0.380***
	[-4.593]	[-5.116]	[-4.148]	[-2.606]
Log Assets	-0.007***	-0.012***	-0.018***	-0.024***
	[-3.512]	[-4.117]	[-4.994]	[-5.962]
M_B	-0.005***	-0.008***	-0.010***	-0.010***
	[-4.615]	[-4.677]	[-4.636]	[-4.275]
Z Score	-0.003***	-0.004***	-0.006***	-0.007***
	[-4.070]	[-3.359]	[-4.135]	[-4.412]
Cash Flow	0.110**	0.162**	0.205***	0.224**
	[2.438]	[2.519]	[2.607]	[2.531]
Growth	-0.006	-0.030	-0.013	-0.038
	[-0.298]	[-1.003]	[-0.355]	[-0.905]
Leverage	0.010	0.018	0.012	-0.008
	[0.487]	[0.581]	[0.319]	[-0.188]
	4,377	4,376	4,358	4,328

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Risk-taking incentives and real manipulations

A result that calls for further examination is the lack of any association between risk-taking incentives and real earnings management strategies documented in table 5.1. This result could be either due to a lack of an association or because any potential association between risk-taking incentives and real earning management is masked by the fact that in the previous analyses we look at the *trade-off* among different strategies but never analyze alone the decision to engage in real earning management.

Grant et al. (2009) find evidence that risk-taking incentives are positively related to measures of income smoothing. This finding suggests that CEOs incentivized on risk engage in earnings management to avoid wide fluctuations in earnings and to preserve shareholder interests and institutional investor preferences. From this perspective, CEOs incentivized on risk might view real earnings management as a tool to increase reported earnings and mitigate the undesired effects of risk. On the other hand, real earnings management encom-

passes cutting discretionary expenditures such as R&D that boost firm's future volatility. Therefore, if on one hand CEOs incentivized on risk might want to use real earnings management to hide the undesired effects of risk taking, on the other hand they might be unfavorable to using real earnings management because it could decreases firm's future risk profile. As a consequence, the relation between CEO's risk incentives and real earnings management as an empirical research question.

To investigate this aspect more in depth, we use the same sample as in table 5.1. and directly examine the association between CEO's risk incentives and the level of real earnings management. Following Zang (2012), we focus on i) reporting a lower cost of goods sold through increased production and ii) decreasing discretionary expenditures as metrics of real earnings management and compute them following (Roychowdhury, 2006; Cohen et al., 2008; Bartov and Cohen, 2009; Cohen and Zarowin, 2010; Zang 2012). Results from a multivariate analysis are reported in table 5.4.

Table 5.4. Risk incentives and real earnings management

	Real EM
Risk Incentives	-0.1622*
	[-1.695]
Control Variables	YES
Year Dummies	YES
Quarter Dummies	YES
Industry Dummies	YES
Observations	4,470

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

The negative and (weakly) statistically significant coefficient on CEOs' risk incentives suggest that CEOs with high risk incentives tend to engage less in real earnings management than do executives with low incentives. This result is consistent with the underlying idea that when CEOs are incentivized on risk they avoid cutting discretionary expenditures such as R&D that might boost firm's future risk profile.

Results presented in table 5.4 call for further analyses. Indeed, real earnings management is made up by two different metrics: abnormal production costs (R_PROD) and abnormal levels of discretionary expenditures (R_ DISX). While

we expect that risk incentives might negatively affect real earnings management that encompasses cutting discretional expenditure (R_DISX), we do not expect such a relation with abnormal production costs (R_PROD). Therefore, in the next analyses we disentangle Real EM into its two components (R_PROD and R_DISX) and test the impact of CEO's risk incentives on these two real earnings management strategies separately. If our reasoning holds, we expect to see a strong negative relation with CEO' risk incentives and R_DISX but we expect only a weak or non-existing relation between CEO's risk incentives and R_PROD.

Consistent with the idea that CEOs incentivized on risk avoid engaging in real management activities that can decrease firm's future risk profile, Table 5.5 shows that there is a negative relation only between CEO's risk incentives and R_DISX, while there is no relation with abnormal production costs. This result is fully consistent with our hypothesis and provides further support to the idea that risk incentives act as a constraint in using real earnings management.

Table 5.5 Disentangling the different components of real earnings management

	R_PROD	R_DISX
	(1)	(2)
Risk Incentives	0.0541	-0.2163***
	[1.027]	[-4.146]
Control Variables	YES	YES
Year Dummies	YES	YES
Quarter Dummies	YES	YES
Industry Dummies	YES	YES
Observations	4,470	4,470

*,**,*** indicate statistical significance at the 10%,5%,1% level, respectively

Concluding remarks

Literature has shown that the market rewards firms meeting or beating earnings expectations (Degeorge et al., 1999; Brown and Caylor, 2005). Companies that are not able to meet earnings targets in the normal course of their operations may engage in the "earnings game" making choices among three

non-exclusive strategies: i) accrual-based earnings management, 2) real activity manipulation, and 3) analysts' expectation guidance. These strategies are not equivalent in terms of costs imposed on the firm because real earnings management, contrary to accrual-based earnings management and analysts' expectation guidance, makes firm's real operations to deviate from their normal course without an underlying economic reason and therefore it might impair firm's future performance. This chapter investigates to which extent CEO's compensation structure plays a role in determining these choices. Specifically, based on evidence taken from a large sample of US firms, we show evidence that CEO's incentives are not neutral with respect to the decision of which earnings game strategy to use. Moreover, the chapter presents a focus on the association between risk-taking incentives and real earnings management. Since risk adverse CEOs are likely to accept less risk than that accepted by diversified shareholders (Fama and French, 1992), companies use option compensation to motivate managers to take risk (Jensen and Meckling, 1976). Nonetheless, risk taking has an intrinsic cost because not all risks produce the expected benefits. Therefore, given CEO risk incentives, real earnings management can be viewed as a tool to avoid the undesirable consequences of risk on reported earnings, such as large losses. However, engaging in real earnings management requires cutting investments, such as R&D, that have a well-documented association with firm's future risk profile (Comin and Philippon, 2005). We show that CEOs with high risk-related incentives engage less in real activity manipulations that encompass cutting discretionary expenditures than do executives with low incentives. These findings are consistent with the idea that CEOs incentivized on risk avoid engaging in real management activities that can decrease firm's future risk profile.

Conclusions

Executive compensation is among the most debated issues in corporate governance with implications that span across accounting, finance and management literature. This makes executive compensation one of the most multidisciplinary issues that over the years has collected contributions from scholars with different backgrounds.

The theoretical lens used to analyze executive compensation topics are rooted in the agency theory (Jensen and Meckling 1976) that investigates the relations between an individual – the principal – that delegates some tasks to another individual – the agent – that should act in such a way to maximize the interests of the former. Since the relation between the agent and the principal is characterize by the presence of potential opportunistic behaviors, the agency theory aims at using optimal contracts to mitigate such conflicts. Being the compensation schemes the core of the contracts designed between the manager and the company, this theoretical framework proves to be an appropriate lens to analyze executive compensation issues.

Two types of opportunistic behaviors could characterize the relation between executives and shareholders. The first type is represented by *pre-contractual opportunism* (adverse selection) that represents a set of opportunistic behaviors a manager can embrace before signing a contract with the aim to mislead the principal using information asymmetry about her future behaviors and intentions. The second type of opportunistic behavior is represented by a post-contractual opportunism (moral hazard) that describes a situation in which the agent (the manager) put in practice a number of actions that are against the moral duty to fully adhere to the contract and in doing so she takes advance from the inability of the principal (shareholder) to fully control her actions. Executive compensation contracts are designed to minimize these behaviors (Jensen and Meckling 1976; Melis et al. 2010). Whitin this framework, this book presents a specific focus on four key themes that are salient to the current debate on the consequences and determinants of executive compensation.

First, we focus on a regulatory change that took place in the US in 2006 to study to which extent the implementation of a new regulation can affect executive compensation's practices. Specifically, from fiscal year 2006 U.S. companies started to report under the new SFAS 123R that mandated the expensing of executives' stock options (ESO) forbidding the use of the intrinsic value method that allowed companies to avoid reporting costs for executive stock option grants. Literature has documented that around the issuance of the new accounting standard companies revised their compensation packages in order to minimize the potential negative impact on profits of the introduction of the new accounting standard (Choudhary et al. 2009). We find that around the adoption of SFAS 123R companies also decreased the role of annual bonuses in the compensation package of their CEOs. Since literature has documented the detrimental effect that short-term oriented compensation components can have on CEO's decision and opportunistic behavior, we argue that when company reviewed CEO's compensation packages as a reaction to SFAS 123R's introduction, they also took this opportunity for substituting annual bonuses with other more long-term oriented compensation components.

Second, we focus on the role of executive compensation in promoting risk-taking behaviors in the banking industry. To do so, we focus on asset securitization activities and document that CEOs with high equity incentives systematically engaged in securitization transactions to a larger extent than CEOs with low equity incentives. We also show that CEO's with high equity and risk-related incentives engaged more in risky securitization activities than CEOs with low incentives and transferred risk to outside investors by moving off-balance the riskiest loans. Finally, we show that executives incentivized on risk provided outside investors with a low quality disclosure about losses recorded on loans that were securitized thus contributing to increase the opacity of transactions undertaken. We interpret these results as evidence that highly incentivized CEOs saw securitization as a useful tool to enhance banks' profits and stock price. Moreover, we argue that risk-incentivized executives saw in securitizations an opportunity to hide the risks generated while betting on them.

Third, we focus on compensation practices of non-CEO executives and we challenge the mainstream view that the CEO's compensation captures all first-order effects and that the consequences of the compensation structure of executives other than the CEO are negligible. By focusing on a non-CEO executive who manages processes and activities that extant literature has documented are particularly important in creating shareholder value, the chapter documents that non-CEO executives play an important role in delivering shareholder value when they are properly incentivized. Moreover, the chapter shows

that companies do not simply rescale CEOs' incentives when deciding how to incent other top executives but they take a proactive role in detecting other economic determinants in order to set the appropriate level of incentives. Findings reported in this chapter warn companies not to focus only on setting the CEO's incentives while neglecting to incent other top executives properly.

Finally, we analyze to which extent CEO's compensation structure plays a role in determining how executives manage earnings and expectations to meet or beat earnings targets. Specifically, based on evidence taken from a large sample of US firms, we show evidence that CEO's incentives are not neutral with respect to the decision of which earnings game strategy to use.

Overall, analyses presented in this book confirm the complexity of analyzing executive compensation to understand its determinants and consequences and highlight the importance of using a multidisciplinary approach when studying how executive incentives translate into actions and strategies.

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Incentive compensation is a central concern in the relationship between the Chief Executive Officer (CEO) and the board of directors and between the CEO and shareholders. This book presents a focus on four key themes that are salient to the current debate on the consequences and determinants of executive compensation. The first topic discussed in the book relates to the role of regulation on executive compensation. By analyzing a specific regulatory change (i.e. the issuance of SFAS 123R in the U.S.) we discuss how firms adjust the compensation structure of their executives following a regulatory change. Next, the analysis moves to compensation practices in the financial industry, and it investigates to which extent compensation incentives are linked to risk-taking behaviors. Subsequently, the compensation structure of non-CEO executives is examined: Most of the literature in accounting and finance neglects the potential effect of the compensation structure of executives other than the CEO and we show that not necessary all first order effects are captured by the compensation structure of the CEO. Finally, the last chapter provides the reader with a focus on the consequences of executive compensation in driving misbehaviors. In doing so, the analysis focuses on earning management strategies as an example of misbehavior and it empirically investigates to which extent CEO's incentives – specifically equity and risk-taking incentives – model the trade-off among the different strategies available to executives to engage into earning manipulations and mislead external stakeholders. Overall, analyses presented in this book confirm the importance of using a multidisciplinary approach when studying how executive incentives translate into actions and strategies.

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